In [1]:
```r
# Sources Used :
# 1. https://bookdown.org/mike/data_analysis/mediation.html (Topic 33 )
# 2. https://cran.r-project.org/web/packages/mediation/mediation.pdf  (Page 11)
# 3. https://imai.fas.harvard.edu/projects/files/mediationReview.pdf [ had this , b
# 4. https://rpubs.com/MichaelGilbertUCR/732775
# 5. https://www.rdocumentation.org/packages/mediation/versions/1.0/topics/mediate
# 6. https://www.r-bloggers.com/2019/08/how-to-do-mediation-scientifically/ [ Not u

install.packages("mediation")
library(mediation)

# Sample data frame 'data' with columns 'Panas..', 'Panas...1', 'BFI..E.', 'BFI..A.
data <- read.csv("Pilot_modified_data_1.csv")


#Case 1
cat("Mediation Analysis Results for Case 1", ":\n")

model.0 <- lm(Panas.. ~ BFI..E., data)
summary(model.0)

model.M <- lm(PAQ ~ BFI..E., data)
summary(model.M)

model.Y <- lm(Panas.. ~ BFI..E. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..E.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

```
also installing the dependencies 'diffobj', 'brio', 'desc', 'pkgload', 'praise',
'waldo', 'checkmate', 'testthat', 'gridExtra', 'htmlTable', 'viridis', 'Formula',
'minqa', 'nloptr', 'mvtnorm', 'sandwich', 'lpSolve', 'Hmisc', 'lme4'


Updating HTML index of packages in '.Library'

Making 'packages.html' ...
 done

Loading required package: MASS

Loading required package: Matrix

Loading required package: mvtnorm

Loading required package: sandwich

mediation: Causal Mediation Analysis
Version: 4.5.0
```

```
Mediation Analysis Results for Case 1 :
```

```
Call:
lm(formula = Panas.. ~ BFI..E., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.0396 -0.0297 -0.0297 -0.0297  0.9703

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 2.009901   0.201318   9.984 2.36e-11 ***
BFI..E.     0.009901   0.101031   0.098    0.923
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1741 on 32 degrees of freedom
Multiple R-squared:  0.0003,    Adjusted R-squared:  -0.03094
F-statistic: 0.009604 on 1 and 32 DF,  p-value: 0.9225
Call:
lm(formula = PAQ ~ BFI..E., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.8317 -0.6238  0.3762  0.3762  1.3762

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.2079     0.7620   1.585    0.123
BFI..E.       0.2079     0.3824   0.544    0.590

Residual standard error: 0.6591 on 32 degrees of freedom
Multiple R-squared:  0.009154, Adjusted R-squared:  -0.02181
F-statistic: 0.2956 on 1 and 32 DF,  p-value: 0.5904
Call:
lm(formula = Panas.. ~ BFI..E. + PAQ, data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-0.06695 -0.03989 -0.02849 -0.01282  0.96011

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 1.977208   0.211301   9.357 1.53e-10 ***
BFI..E.     0.004274   0.102578   0.042    0.967
PAQ         0.027066   0.047202   0.573    0.571
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.176 on 31 degrees of freedom
Multiple R-squared:  0.01079,   Adjusted R-squared:  -0.05303
F-statistic: 0.1691 on 2 and 31 DF,  p-value: 0.8452
```

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Running nonparametric bootstrap


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t):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
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9/10/23, 2:44 AM   Case1

```
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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```

```
Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

                  Estimate 95% CI Lower 95% CI Upper p-value
ACME               0.00563     -0.02042         0.05    0.60
ADE                0.00427     -0.01844         0.04    0.37
Total Effect       0.00990     -0.03282         0.07    0.67
Prop. Mediated     0.56838     -1.53846         1.00      NA

Sample Size Used: 34


Simulations: 1500
```

In [2]:
```
#Case 2
cat("Mediation Analysis Results for Case 2", ":\n")

model.0 <- lm(Panas.. ~ BFI..A., data)
summary(model.0)

model.M <- lm(PAQ ~ BFI..A., data)
summary(model.M)

model.Y <- lm(Panas.. ~ BFI..A. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..A.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

```
Mediation Analysis Results for Case 2 :
```

```
Call:
lm(formula = Panas.. ~ BFI..A., data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-0.10685 -0.02192 -0.02192 -0.02192  0.89315

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.85205    0.11027  16.796   <2e-16 ***
BFI..A.      0.08493    0.05099   1.666    0.106
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1671 on 32 degrees of freedom
Multiple R-squared:  0.07978,   Adjusted R-squared:  0.05103
F-statistic: 2.774 on 1 and 32 DF,  p-value: 0.1055
Call:
lm(formula = PAQ ~ BFI..A., data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-1.13973 -0.56712  0.00548  0.43288  1.43288

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   0.4219     0.3782   1.115  0.27296
BFI..A.       0.5726     0.1749   3.274  0.00255 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5731 on 32 degrees of freedom
Multiple R-squared:  0.2509,    Adjusted R-squared:  0.2275
F-statistic: 10.72 on 1 and 32 DF,  p-value: 0.002551
Call:
lm(formula = Panas.. ~ BFI..A. + PAQ, data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-0.12200 -0.02946 -0.02281 -0.01616  0.89129

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.85766    0.11407  16.286   <2e-16 ***
BFI..A.      0.09254    0.05979   1.548    0.132
PAQ         -0.01330    0.05230  -0.254    0.801
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1696 on 31 degrees of freedom
Multiple R-squared:  0.0817,    Adjusted R-squared:  0.02245
F-statistic: 1.379 on 2 and 31 DF,  p-value: 0.2669
Running nonparametric bootstrap
```

Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

	Estimate	95% CI Lower	95% CI Upper	p-value
ACME	-7.61e-03	-6.33e-02	0.01	0.63
ADE	9.25e-02	-4.48e-16	0.31	0.24
Total Effect	8.49e-02	-4.44e-16	0.28	0.32
Prop. Mediated	-8.96e-02	-3.86e+00	1.00	0.62

Sample Size Used: 34

Simulations: 1500

In [3]:
```r
#Case 3
cat("Mediation Analysis Results for Case 3", ":\n")

model.0 <- lm(Panas.. ~ BFI..C., data)
summary(model.0)

model.M <- lm(PAQ ~ BFI..C., data)
summary(model.M)

model.Y <- lm(Panas.. ~ BFI..C. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..C.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

Mediation Analysis Results for Case 3 :
Call:
lm(formula = Panas.. ~ BFI..C., data = data)

Residuals:
    Min   1Q   Median   3Q   Max
-0.02941 -0.02941 -0.02941 -0.02941 0.97059

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 2.029e+00 1.767e-01   11.48 6.9e-13 ***
BFI..C.   2.912e-17 8.708e-02   0.00   1

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1742 on 32 degrees of freedom
Multiple R-squared: 2.032e-29, Adjusted R-squared: -0.03125
F-statistic: 6.502e-28 on 1 and 32 DF, p-value: 1

```
Call:
lm(formula = PAQ ~ BFI..C., data = data)

Residuals:
    Min     1Q  Median     3Q     Max
-0.8677 -0.6177  0.2574  0.3824  1.3823

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.1176     0.6658   3.181  0.00326 **
BFI..C.      -0.2500     0.3281  -0.762  0.45167
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6562 on 32 degrees of freedom
Multiple R-squared:  0.01782,   Adjusted R-squared:  -0.01287
F-statistic: 0.5806 on 1 and 32 DF,  p-value: 0.4517
Call:
lm(formula = Panas.. ~ BFI..C. + PAQ, data = data)

Residuals:
    Min       1Q   Median       3Q      Max
-0.06777 -0.04002 -0.02615 -0.01227  0.95998

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 1.970651   0.204831   9.621    8e-11 ***
BFI..C.     0.006937   0.088782   0.078    0.938
PAQ         0.027748   0.047406   0.585    0.563
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.176 on 31 degrees of freedom
Multiple R-squared:  0.01093,   Adjusted R-squared:  -0.05288
F-statistic: 0.1713 on 2 and 31 DF,  p-value: 0.8434
```

```
Running nonparametric bootstrap


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"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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"prediction from a rank-deficient fit may be misleading"
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c):
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"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
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c):
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c):
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c):
"prediction from a rank-deficient fit may be misleading"
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"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.

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t):
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c):
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"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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c):
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Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
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c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
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Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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c):
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t):
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c):
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Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
```

c):
"prediction from a rank-deficient fit may be misleading"
Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

	Estimate	95% CI Lower	95% CI Upper	p-value
ACME	-6.94e-03	-4.87e-02	1.00e-02	0.52
ADE	6.94e-03	-3.04e-02	6.00e-02	0.46
Total Effect	5.20e-17	-6.25e-02	6.00e-02	0.90
Prop. Mediated	-1.33e+14	-2.38e+14	1.81e+13	NA

Sample Size Used: 34

Simulations: 1500

In [4]:
```r
#Case 4
cat("Mediation Analysis Results for Case 4", ":\n")

model.0 <- lm(Panas.. ~ BFI..N., data)
summary(model.0)

model.M <- lm(PAQ ~ BFI..N., data)
summary(model.M)

model.Y <- lm(Panas.. ~ BFI..N. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..N.', mediator='PAQ',
                   boot=TRUE, sims=500)
summary(results)
```

Mediation Analysis Results for Case 4 :
Call:
lm(formula = Panas.. ~ BFI..N., data = data)

Residuals:
    Min   1Q   Median   3Q   Max
-0.10396 -0.02475 -0.02475 -0.02475 0.89604

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 1.86634   0.10398 17.949   <2e-16 ***
BFI..N.   0.07921   0.04854   1.632   0.113

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1673 on 32 degrees of freedom
Multiple R-squared: 0.07681,   Adjusted R-squared: 0.04796
F-statistic: 2.662 on 1 and 32 DF, p-value: 0.1126

```
Call:
lm(formula = PAQ ~ BFI..N., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.6782 -0.6139  0.3218  0.3861  1.3861

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.48515    0.41073   3.616  0.00102 **
BFI..N.      0.06436    0.19175   0.336  0.73934
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.661 on 32 degrees of freedom
Multiple R-squared:  0.003508,  Adjusted R-squared:  -0.02763
F-statistic: 0.1126 on 1 and 32 DF,  p-value: 0.7393
Call:
lm(formula = Panas.. ~ BFI..N. + PAQ, data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-0.11137 -0.05090 -0.03364 -0.01062  0.88863

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.83215    0.12487  14.673 1.69e-15 ***
BFI..N.      0.07773    0.04920   1.580    0.124
PAQ          0.02302    0.04528   0.508    0.615
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1693 on 31 degrees of freedom
Multiple R-squared:  0.08444,   Adjusted R-squared:  0.02537
F-statistic:  1.43 on 2 and 31 DF,  p-value: 0.2548
```

```
Running nonparametric bootstrap
```

```
Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

                 Estimate 95% CI Lower 95% CI Upper p-value
ACME            1.48e-03    -1.26e-02         0.01    0.80
ADE             7.77e-02    -4.54e-16         0.29    0.17
Total Effect    7.92e-02    -4.77e-16         0.30    0.39
Prop. Mediated  1.87e-02    -2.23e-01         1.00      NA

Sample Size Used: 34


Simulations: 500
```

In [5]:
```
#Case 5
cat("Mediation Analysis Results for Case 5", ":\n")
```

```r
model.0 <- lm(Panas.. ~ BFI..O., data)
summary(model.0)

model.M <- lm(PAQ ~ BFI..O., data)
summary(model.M)

model.Y <- lm(Panas.. ~ BFI..O. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..O.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

```
Mediation Analysis Results for Case 5 :
Call:
lm(formula = Panas.. ~ BFI..O., data = data)

Residuals:
   Min     1Q Median     3Q    Max
-0.100 -0.075  0.000  0.000  0.900

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.80000    0.14764  12.192 1.44e-13 ***
BFI..O.      0.10000    0.06312   1.584    0.123
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1677 on 32 degrees of freedom
Multiple R-squared:  0.07273,   Adjusted R-squared:  0.04375
F-statistic:  2.51 on 1 and 32 DF,  p-value: 0.123
Call:
lm(formula = PAQ ~ BFI..O., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.7000 -0.5833  0.3000  0.4167  1.4167

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.3500     0.5809   2.324   0.0266 *
BFI..O.       0.1167     0.2484   0.470   0.6417
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6599 on 32 degrees of freedom
Multiple R-squared:  0.006848,  Adjusted R-squared:  -0.02419
F-statistic: 0.2207 on 1 and 32 DF,  p-value: 0.6417
```

```
Call:
lm(formula = Panas.. ~ BFI..O. + PAQ, data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-0.10646 -0.07132 -0.00897  0.01256  0.89354

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.77093    0.16158  10.960 3.43e-12 ***
BFI..O.      0.09749    0.06412   1.520    0.139
PAQ          0.02153    0.04548   0.473    0.639
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1698 on 31 degrees of freedom
Multiple R-squared:  0.07938,   Adjusted R-squared:  0.01999
F-statistic: 1.337 on 2 and 31 DF,  p-value: 0.2775
```

Running nonparametric bootstrap


```
Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

                Estimate 95% CI Lower 95% CI Upper p-value
ACME            2.51e-03      -9.93e-03         0.02    0.66
ADE             9.75e-02      -5.45e-16         0.32    0.21
Total Effect    1.00e-01      -5.55e-16         0.33    0.21
Prop. Mediated  2.51e-02      -3.60e-01         1.00    0.63

Sample Size Used: 34


Simulations: 1500
```

In [6]:
```r
#Case 6
cat("Mediation Analysis Results for Case 6", ":\n")

model.0 <- lm(Panas.. ~ EI..Self.A., data)
summary(model.0)

model.M <- lm(PAQ ~ EI..Self.A., data)
summary(model.M)

model.Y <- lm(Panas.. ~ EI..Self.A. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='EI..Self.A.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

Mediation Analysis Results for Case 6 :

```
Call:
lm(formula = Panas.. ~ EI..Self.A., data = data)

Residuals:
     Min      1Q   Median      3Q      Max
-0.02941 -0.02941 -0.02941 -0.02941  0.97059

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) 2.029e+00  2.855e-01   7.107  4.6e-08 ***
EI..Self.A. 9.513e-18  3.688e-03   0.000        1
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1742 on 32 degrees of freedom
Multiple R-squared:  2.052e-29, Adjusted R-squared:  -0.03125
F-statistic: 6.567e-28 on 1 and 32 DF,  p-value: 1
Call:
lm(formula = PAQ ~ EI..Self.A., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.7746 -0.6098  0.2254  0.4137  1.5079

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.82617    1.06414   2.656   0.0122 *
EI..Self.A. -0.01570    0.01374  -1.142   0.2620
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.649 on 32 degrees of freedom
Multiple R-squared:  0.03916,   Adjusted R-squared:  0.009129
F-statistic: 1.304 on 1 and 32 DF,  p-value: 0.262
Call:
lm(formula = Panas.. ~ EI..Self.A. + PAQ, data = data)

Residuals:
     Min      1Q   Median      3Q      Max
-0.07218 -0.04115 -0.02652 -0.01189  0.95974

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) 1.9492496  0.3186973   6.116 8.82e-07 ***
EI..Self.A. 0.0004452  0.0038012   0.117    0.908
PAQ         0.0283643  0.0479237   0.592    0.558
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.176 on 31 degrees of freedom
Multiple R-squared:  0.01117,   Adjusted R-squared:  -0.05262
F-statistic: 0.1752 on 2 and 31 DF,  p-value: 0.8402
Running nonparametric bootstrap
```

Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

	Estimate	95% CI Lower	95% CI Upper	p-value
ACME	-4.45e-04	-2.65e-03	0.0	0.45
ADE	4.45e-04	-5.34e-03	0.0	0.49
Total Effect	-1.04e-16	-4.36e-03	0.0	0.71
Prop. Mediated	4.26e+12	-1.22e+01	11.9	NA

Sample Size Used: 34

Simulations: 1500

In [7]:
```r
#Case 7
cat("Mediation Analysis Results for Case 7", ":\n")

model.0 <- lm(Panas.. ~ EI..Self.M., data)
summary(model.0)

model.M <- lm(PAQ ~ EI..Self.M., data)
summary(model.M)

model.Y <- lm(Panas.. ~ EI..Self.M.. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='EI..Self.M.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

Mediation Analysis Results for Case 7 :
Call:
lm(formula = Panas.. ~ EI..Self.M., data = data)

Residuals:
     Min   1Q   Median   3Q   Max
-0.13357 -0.04223 -0.02115 0.01223 0.86994

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 2.260053   0.123159 18.351 <2e-16 ***
EI..Self.M. -0.003513   0.001826 -1.924 0.0633 .

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1649 on 32 degrees of freedom
Multiple R-squared: 0.1037,   Adjusted R-squared: 0.07569
F-statistic: 3.702 on 1 and 32 DF, p-value: 0.06327

```
Call:
lm(formula = PAQ ~ EI..Self.M., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.7516 -0.5779  0.2301  0.4064  1.4573

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.960531   0.490648   3.996 0.000354 ***
EI..Self.M. -0.005223   0.007274  -0.718 0.477955
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6569 on 32 degrees of freedom
Multiple R-squared:  0.01586,   Adjusted R-squared:  -0.0149
F-statistic: 0.5156 on 1 and 32 DF,  p-value: 0.478
```

```
Error in eval(predvars, data, env): object 'EI..Self.M..' not found
Traceback:

1. lm(Panas.. ~ EI..Self.M.. + PAQ, data)
2. eval(mf, parent.frame())
3. eval(mf, parent.frame())
4. stats::model.frame(formula = Panas.. ~ EI..Self.M.. + PAQ, data = data,
 .      drop.unused.levels = TRUE)
5. model.frame.default(formula = Panas.. ~ EI..Self.M.. + PAQ, data = data,
 .      drop.unused.levels = TRUE)
6. eval(predvars, data, env)
7. eval(predvars, data, env)
```

In [8]:
```
#Case 8
cat("Mediation Analysis Results for Case 8", ":\n")

model.0 <- lm(Panas.. ~ EI..Social.A., data)
summary(model.0)

model.M <- lm(PAQ ~ EI..Social.A., data)
summary(model.M)

model.Y <- lm(Panas.. ~ EI..Social.A. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='EI..Social.A.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

Mediation Analysis Results for Case 8 :

```
Call:
lm(formula = Panas.. ~ EI..Social.A., data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-0.03441 -0.03124 -0.02934 -0.02672  0.97035

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)    2.054065   0.277335   7.406    2e-08 ***
EI..Social.A. -0.000317   0.003546  -0.089    0.929
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1741 on 32 degrees of freedom
Multiple R-squared:  0.0002498, Adjusted R-squared:  -0.03099
F-statistic: 0.007995 on 1 and 32 DF,  p-value: 0.9293
Call:
lm(formula = PAQ ~ EI..Social.A., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.7422 -0.6039  0.2657  0.3763  1.4632

Coefficients:
               Estimate Std. Error t value Pr(>|t|)
(Intercept)    2.232088   1.048859   2.128   0.0411 *
EI..Social.A. -0.007901   0.013409  -0.589   0.5598
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6586 on 32 degrees of freedom
Multiple R-squared:  0.01073,   Adjusted R-squared:  -0.02018
F-statistic: 0.3472 on 1 and 32 DF,  p-value: 0.5598
Call:
lm(formula = Panas.. ~ EI..Social.A. + PAQ, data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-0.06790 -0.04032 -0.02625 -0.01254  0.96014

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
(Intercept)    1.9935444  0.2994649   6.657 1.92e-07 ***
EI..Social.A. -0.0001028  0.0036027  -0.029    0.977
PAQ            0.0271140  0.0472401   0.574    0.570
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.176 on 31 degrees of freedom
Multiple R-squared:  0.01076,   Adjusted R-squared:  -0.05306
F-statistic: 0.1686 on 2 and 31 DF,  p-value: 0.8456
Running nonparametric bootstrap
```

Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

	Estimate	95% CI Lower	95% CI Upper	p-value
ACME	-2.14e-04	-2.42e-03	0.0	0.42
ADE	-1.03e-04	-2.75e-03	0.0	0.56
Total Effect	-3.17e-04	-3.10e-03	0.0	0.47
Prop. Mediated	6.76e-01	-1.40e+01	10.2	NA

Sample Size Used: 34

Simulations: 1500

In [9]:
```r
#Case 9
cat("Mediation Analysis Results for Case 9", ":\n")

model.0 <- lm(Panas.. ~ EI..RM., data)
summary(model.0)

model.M <- lm(PAQ ~ EI..RM., data)
summary(model.M)

model.Y <- lm(Panas.. ~ EI..RM. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='EI..RM.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

Mediation Analysis Results for Case 9 :
Call:
lm(formula = Panas.. ~ EI..RM., data = data)

Residuals:
    Min   1Q   Median   3Q   Max
-0.03198 -0.03020 -0.02898 -0.02870 0.97055

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) 2.036e+00 1.875e-01 10.858 2.91e-12 ***
EI..RM.   -9.383e-05 2.629e-03 -0.036   0.972

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1742 on 32 degrees of freedom
Multiple R-squared: 3.981e-05, Adjusted R-squared: -0.03121
F-statistic: 0.001274 on 1 and 32 DF, p-value: 0.9717

```
Call:
lm(formula = PAQ ~ EI..RM., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.7430 -0.4650 -0.1368  0.4597  1.5350

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  3.248633   0.650328   4.995 2.01e-05 ***
EI..RM.     -0.023164   0.009118  -2.540   0.0161 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.604 on 32 degrees of freedom
Multiple R-squared:  0.1678,    Adjusted R-squared:  0.1418
F-statistic: 6.454 on 1 and 32 DF,  p-value: 0.01613
Call:
lm(formula = Panas.. ~ EI..RM. + PAQ, data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-0.07781 -0.04297 -0.02184 -0.01394  0.95864

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept) 1.9322801  0.2525894   7.650 1.26e-08 ***
EI..RM.     0.0006458  0.0029100   0.222    0.826
PAQ         0.0319330  0.0514661   0.620    0.539
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1759 on 31 degrees of freedom
Multiple R-squared:  0.01231,    Adjusted R-squared:  -0.05142
F-statistic: 0.1931 on 2 and 31 DF,  p-value: 0.8254
```

Running nonparametric bootstrap

```
Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

                Estimate 95% CI Lower 95% CI Upper p-value
ACME           -7.40e-04    -4.02e-03          0.0    0.13
ADE             6.46e-04    -1.03e-03          0.0    0.21
Total Effect   -9.38e-05    -1.95e-03          0.0    0.65
Prop. Mediated  7.88e+00    -2.44e+01         18.5      NA

Sample Size Used: 34


Simulations: 1500
```

```
In [10]: #Case 10
         cat("Mediation Analysis Results for Case 10", ":\n")
```

```r
model.0 <- lm(Panas.. ~ Total, data)
summary(model.0)

model.M <- lm(PAQ ~ Total, data)
summary(model.M)

model.Y <- lm(Panas.. ~ Total + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='Total', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

```
Mediation Analysis Results for Case 10 :
Call:
lm(formula = Panas.. ~ Total, data = data)

Residuals:
     Min      1Q   Median      3Q      Max
-0.09487 -0.05897 -0.02308  0.00385  0.94103

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.1308     0.1053  20.239   <2e-16 ***
Total        -0.0359     0.0358  -1.003    0.324
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1715 on 32 degrees of freedom
Multiple R-squared:  0.03046,   Adjusted R-squared:  0.0001603
F-statistic: 1.005 on 1 and 32 DF,  p-value: 0.3236
Call:
lm(formula = PAQ ~ Total, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.6282 -0.6154  0.3654  0.3846  1.3974

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.65385    0.40646   4.069 0.000288 ***
Total       -0.01282    0.13822  -0.093 0.926678
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.662 on 32 degrees of freedom
Multiple R-squared:  0.0002688, Adjusted R-squared:  -0.03097
F-statistic: 0.008603 on 1 and 32 DF,  p-value: 0.9267
```

```
Call:
lm(formula = Panas.. ~ Total + PAQ, data = data)

Residuals:
     Min       1Q    Median       3Q      Max
-0.10439 -0.04232 -0.02422 -0.00676  0.93117

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.08693    0.13107  15.922   <2e-16 ***
Total       -0.03556    0.03619  -0.983    0.333
PAQ          0.02651    0.04628   0.573    0.571
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1733 on 31 degrees of freedom
Multiple R-squared:  0.04061,   Adjusted R-squared:  -0.02128
F-statistic: 0.6561 on 2 and 31 DF,  p-value: 0.5259
```

Running nonparametric bootstrap


```
Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

                Estimate 95% CI Lower 95% CI Upper p-value
ACME            -0.00034     -0.01451         0.01    0.87
ADE             -0.03556     -0.13145         0.00    0.19
Total Effect    -0.03590     -0.12956         0.00    0.33
Prop. Mediated   0.00947     -0.35256         1.00      NA

Sample Size Used: 34


Simulations: 1500
```

In [11]:
```r
#Case 11
cat("Mediation Analysis Results for Case 10", ":\n")

model.0 <- lm(Panas.. ~ CBCL, data)
summary(model.0)

model.M <- lm(PAQ ~ CBCL, data)
summary(model.M)

model.Y <- lm(Panas.. ~ CBCL + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='CBCL', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

Mediation Analysis Results for Case 10 :

```
Call:
lm(formula = Panas.. ~ CBCL, data = data)

Residuals:
   Min    1Q Median    3Q    Max
 -0.25   0.00   0.00   0.00   0.75

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.50000    0.15562  16.064  < 2e-16 ***
CBCL        -0.25000    0.08149  -3.068  0.00436 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1531 on 32 degrees of freedom
Multiple R-squared:  0.2273,    Adjusted R-squared:  0.2031
F-statistic: 9.412 on 1 and 32 DF,  p-value: 0.004365
```
```
Call:
lm(formula = PAQ ~ CBCL, data = data)

Residuals:
    Min     1Q  Median     3Q    Max
-0.6333 -0.6333  0.3667  0.3667  1.3667

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.3667     0.6716   2.035   0.0502 .
CBCL          0.1333     0.3517   0.379   0.7071
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6606 on 32 degrees of freedom
Multiple R-squared:  0.004472, Adjusted R-squared:  -0.02664
F-statistic: 0.1438 on 1 and 32 DF,  p-value: 0.7071
```
```
Call:
lm(formula = Panas.. ~ CBCL + PAQ, data = data)

Residuals:
    Min      1Q   Median      3Q     Max
-0.26790 -0.01313 -0.01313  0.02267  0.73210

Coefficients:
             Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.45107    0.16602  14.764 1.43e-15 ***
CBCL        -0.25477    0.08198  -3.108  0.00402 **
PAQ          0.03580    0.04112   0.871  0.39066
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.1537 on 31 degrees of freedom
Multiple R-squared:  0.2457,    Adjusted R-squared:  0.1971
F-statistic: 5.049 on 2 and 31 DF,  p-value: 0.01264
```

```
Running nonparametric bootstrap


Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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"prediction from a rank-deficient fit may be misleading"
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t):
"prediction from a rank-deficient fit may be misleading"
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c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
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c):
"prediction from a rank-deficient fit may be misleading"
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"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
```

"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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"prediction from a rank-deficient fit may be misleading"
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t):
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Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
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c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.

```
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
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c):
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t):
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t):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
```

Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

```
                 Estimate 95% CI Lower 95% CI Upper p-value
ACME              0.00477     -0.01070         0.03   0.753
ADE              -0.25477     -1.00000         0.00   0.088 .
Total Effect     -0.25000     -1.00000         0.00   0.077 .
Prop. Mediated   -0.01909     -1.17692         1.00     NA
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1


Sample Size Used: 34


Simulations: 1500
```

In [12]:
```r
#Case 12
cat("Mediation Analysis Results for Case 12", ":\n")

model.0 <- lm(Panas...1 ~ BFI..E., data)
summary(model.0)

model.M <- lm(PAQ ~ BFI..E., data)
summary(model.M)

model.Y <- lm(Panas...1 ~ BFI..E. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..E.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)


#Case 13
cat("Mediation Analysis Results for Case 13", ":\n")

model.0 <- lm(Panas...1 ~ BFI..A., data)
summary(model.0)

model.M <- lm(PAQ ~ BFI..A., data)
summary(model.M)

model.Y <- lm(Panas...1 ~ BFI..A. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..A.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)


#Case 14
cat("Mediation Analysis Results for Case 14", ":\n")

model.0 <- lm(Panas...1 ~ BFI..C., data)
```

```r
summary(model.0)

model.M <- lm(PAQ ~ BFI..C., data)
summary(model.M)

model.Y <- lm(Panas...1 ~ BFI..C. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..C.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)

#Case 15
cat("Mediation Analysis Results for Case 15", ":\n")

model.0 <- lm(Panas...1 ~ BFI..N., data)
summary(model.0)

model.M <- lm(PAQ ~ BFI..N., data)
summary(model.M)

model.Y <- lm(Panas...1 ~ BFI..N. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..N.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)

#Case 16
cat("Mediation Analysis Results for Case 16", ":\n")

model.0 <- lm(Panas...1 ~ BFI..O., data)
summary(model.0)

model.M <- lm(PAQ ~ BFI..O., data)
summary(model.M)

model.Y <- lm(Panas...1 ~ BFI..O. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..O.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)

#Case 17
cat("Mediation Analysis Results for Case 17", ":\n")

model.0 <- lm(Panas...1 ~ EI..Self.A., data)
summary(model.0)

model.M <- lm(PAQ ~ EI..Self.A., data)
summary(model.M)

model.Y <- lm(Panas...1 ~ EI..Self.A. + PAQ, data)
summary(model.Y)
```

```r
results <- mediate(model.M, model.Y, treat='EI..Self.A.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)

#Case 18
cat("Mediation Analysis Results for Case 18", ":\n")

model.0 <- lm(Panas...1 ~ EI..Self.M., data)
summary(model.0)

model.M <- lm(PAQ ~ EI..Self.M., data)
summary(model.M)

model.Y <- lm(Panas...1 ~ EI..Self.M.. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='EI..Self.M.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)

#Case 19
cat("Mediation Analysis Results for Case 19", ":\n")

model.0 <- lm(Panas...1 ~ EI..Social.A., data)
summary(model.0)

model.M <- lm(PAQ ~ EI..Social.A., data)
summary(model.M)

model.Y <- lm(Panas...1 ~ EI..Social.A. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='EI..Social.A.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)


#Case 20
cat("Mediation Analysis Results for Case 20", ":\n")

model.0 <- lm(Panas...1 ~ EI..RM., data)
summary(model.0)

model.M <- lm(PAQ ~ EI..RM., data)
summary(model.M)

model.Y <- lm(Panas...1 ~ EI..RM. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='EI..RM.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)

#Case 21
cat("Mediation Analysis Results for Case 21", ":\n")
```

```r
model.0 <- lm(Panas...1 ~ Total, data)
summary(model.0)

model.M <- lm(PAQ ~ Total, data)
summary(model.M)

model.Y <- lm(Panas...1 ~ Total + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='Total', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)

#Case 22
cat("Mediation Analysis Results for Case 22", ":\n")

model.0 <- lm(Panas...1 ~ CBCL, data)
summary(model.0)

model.M <- lm(PAQ ~ CBCL, data)
summary(model.M)

model.Y <- lm(Panas...1 ~ CBCL + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='CBCL', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

```
Mediation Analysis Results for Case 12 :
Call:
lm(formula = Panas...1 ~ BFI..E., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.5248 -0.5248  0.3168  0.4753  0.6337

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.8416     0.5922   3.110  0.00392 **
BFI..E.      -0.1584     0.2972  -0.533  0.59769
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5122 on 32 degrees of freedom
Multiple R-squared:  0.008801,  Adjusted R-squared:  -0.02217
F-statistic: 0.2841 on 1 and 32 DF,  p-value: 0.5977
```

```
Call:
lm(formula = PAQ ~ BFI..E., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.8317 -0.6238  0.3762  0.3762  1.3762

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.2079     0.7620   1.585    0.123
BFI..E.       0.2079     0.3824   0.544    0.590

Residual standard error: 0.6591 on 32 degrees of freedom
Multiple R-squared:  0.009154,  Adjusted R-squared:  -0.02181
F-statistic: 0.2956 on 1 and 32 DF,  p-value: 0.5904
Call:
lm(formula = Panas...1 ~ BFI..E. + PAQ, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.5784 -0.4359  0.2792  0.4217  0.7521

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.6695     0.6143   2.718   0.0107 *
BFI..E.      -0.1880     0.2982  -0.631   0.5330
PAQ           0.1425     0.1372   1.038   0.3072
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5116 on 31 degrees of freedom
Multiple R-squared:  0.0421,    Adjusted R-squared:  -0.0197
F-statistic: 0.6813 on 2 and 31 DF,  p-value: 0.5134
```

```
Running nonparametric bootstrap


Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
```

“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.

```
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
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Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
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c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
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c):
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c):
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t):
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c):

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t):
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c):
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Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.

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t):
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"prediction from a rank-deficient fit may be misleading"
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
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"prediction from a rank-deficient fit may be misleading"
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
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t):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
```
"prediction from a rank-deficient fit may be misleading"
```
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
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"prediction from a rank-deficient fit may be misleading"
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Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
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"prediction from a rank-deficient fit may be misleading"
```
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
```
"prediction from a rank-deficient fit may be misleading"
```
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
```
"prediction from a rank-deficient fit may be misleading"
```
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
```
"prediction from a rank-deficient fit may be misleading"
```
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
```
"prediction from a rank-deficient fit may be misleading"
```
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
```
"prediction from a rank-deficient fit may be misleading"
```
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
```
"prediction from a rank-deficient fit may be misleading"
```
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
```
"prediction from a rank-deficient fit may be misleading"
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"prediction from a rank-deficient fit may be misleading"
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```
Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

                Estimate 95% CI Lower 95% CI Upper p-value
ACME              0.0296       -0.1690          0.27     0.58
ADE              -0.1880       -0.8476          0.70     0.47
Total Effect     -0.1584       -0.6452          0.52     0.48
Prop. Mediated   -0.1870       -0.6275          0.32       NA

Sample Size Used: 34


Simulations: 1500
Mediation Analysis Results for Case 13 :
Call:
lm(formula = Panas...1 ~ BFI..A., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.5890 -0.5343  0.4110  0.4657  0.5205

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.64384    0.33893    4.85 3.07e-05 ***
BFI..A.     -0.05479    0.15673   -0.35    0.729
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5135 on 32 degrees of freedom
Multiple R-squared:  0.003805,  Adjusted R-squared:  -0.02733
F-statistic: 0.1222 on 1 and 32 DF,  p-value: 0.7289
```

```
Call:
lm(formula = PAQ ~ BFI..A., data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-1.13973 -0.56712  0.00548  0.43288  1.43288

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   0.4219     0.3782   1.115  0.27296
BFI..A.       0.5726     0.1749   3.274  0.00255 **
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5731 on 32 degrees of freedom
Multiple R-squared:  0.2509,    Adjusted R-squared:  0.2275
F-statistic: 10.72 on 1 and 32 DF,  p-value: 0.002551
Call:
lm(formula = Panas...1 ~ BFI..A. + PAQ, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.6257 -0.4500  0.2510  0.4009  0.5855

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.5547     0.3411   4.558 7.59e-05 ***
BFI..A.      -0.1757     0.1788  -0.983    0.333
PAQ           0.2112     0.1564   1.350    0.187
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.507 on 31 degrees of freedom
Multiple R-squared:  0.05913,   Adjusted R-squared:  -0.001576
F-statistic: 0.974 on 2 and 31 DF,  p-value: 0.3888
```

Running nonparametric bootstrap

Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

	Estimate	95% CI Lower	95% CI Upper	p-value
ACME	0.1209	-0.0662	0.30	0.16
ADE	-0.1757	-0.4832	0.19	0.33
Total Effect	-0.0548	-0.3574	0.26	0.73
Prop. Mediated	-2.2066	-19.6003	16.05	0.77

Sample Size Used: 34

Simulations: 1500
Mediation Analysis Results for Case 14 :

```
Call:
lm(formula = Panas...1 ~ BFI..C., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.5294 -0.5294  0.4706  0.4706  0.4706

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) 1.529e+00  5.220e-01    2.93  0.00621 **
BFI..C.     5.935e-16  2.572e-01    0.00  1.00000
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5145 on 32 degrees of freedom
Multiple R-squared:  1.077e-30, Adjusted R-squared:  -0.03125
F-statistic: 3.446e-29 on 1 and 32 DF,  p-value: 1
Call:
lm(formula = PAQ ~ BFI..C., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.8677 -0.6177  0.2574  0.3824  1.3823

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.1176     0.6658   3.181  0.00326 **
BFI..C.      -0.2500     0.3281  -0.762  0.45167
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6562 on 32 degrees of freedom
Multiple R-squared:  0.01782,   Adjusted R-squared:  -0.01287
F-statistic: 0.5806 on 1 and 32 DF,  p-value: 0.4517
Call:
lm(formula = Panas...1 ~ BFI..C. + PAQ, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.5816 -0.4707  0.2818  0.4440  0.5550

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.24013    0.59914   2.070   0.0469 *
BFI..C.      0.03415    0.25969   0.132   0.8962
PAQ          0.13661    0.13866   0.985   0.3322
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5147 on 31 degrees of freedom
Multiple R-squared:  0.03036,   Adjusted R-squared:  -0.0322
F-statistic: 0.4853 on 2 and 31 DF,  p-value: 0.6201
```

```
Running nonparametric bootstrap


Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
c):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
t):
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t):
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c):
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t):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
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“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.t):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.c):
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Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.t):
“prediction from a rank-deficient fit may be misleading”
Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.c):
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t):
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Warning message in predict.lm(new.fit.Y, type = "response", newdata = pred.data.
c):
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Warning message in predict.lm(new.fit.M, type = "response", newdata = pred.data.
t):
"prediction from a rank-deficient fit may be misleading"
```

Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

	Estimate	95% CI Lower	95% CI Upper	p-value
ACME	-3.42e-02	-1.68e-01	9.00e-02	0.57
ADE	3.42e-02	-4.97e-01	5.40e-01	0.87
Total Effect	5.62e-16	-5.15e-01	5.50e-01	0.97
Prop. Mediated	-6.08e+13	-3.22e+13	2.63e+13	NA

Sample Size Used: 34

Simulations: 1500
Mediation Analysis Results for Case 15 :

```
Call:
lm(formula = Panas...1 ~ BFI..N., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.6040 -0.5248  0.3960  0.4753  0.5545

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.36634    0.31830   4.293 0.000153 ***
BFI..N.      0.07921    0.14860   0.533 0.597691
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5122 on 32 degrees of freedom
Multiple R-squared:  0.008801,  Adjusted R-squared:  -0.02217
F-statistic: 0.2841 on 1 and 32 DF,  p-value: 0.5977
Call:
lm(formula = PAQ ~ BFI..N., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.6782 -0.6139  0.3218  0.3861  1.3861

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.48515    0.41073   3.616  0.00102 **
BFI..N.      0.06436    0.19175   0.336  0.73934
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.661 on 32 degrees of freedom
Multiple R-squared:  0.003508,  Adjusted R-squared:  -0.02763
F-statistic: 0.1126 on 1 and 32 DF,  p-value: 0.7393
Call:
lm(formula = Panas...1 ~ BFI..N. + PAQ, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.6459 -0.5128  0.2946  0.4249  0.6261

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.17280    0.37835   3.100   0.0041 **
BFI..N.      0.07082    0.14909   0.475   0.6381
PAQ          0.13031    0.13721   0.950   0.3496
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.513 on 31 degrees of freedom
Multiple R-squared:  0.03683,   Adjusted R-squared:  -0.02531
F-statistic: 0.5926 on 2 and 31 DF,  p-value: 0.559
Running nonparametric bootstrap
```

```
Causal Mediation Analysis


Nonparametric Bootstrap Confidence Intervals with the Percentile Method


                   Estimate 95% CI Lower 95% CI Upper p-value
ACME               0.00839     -0.05093         0.09    0.76
ADE                0.07082     -0.24108         0.37    0.62
Total Effect       0.07921     -0.23211         0.38    0.59
Prop. Mediated     0.10588     -3.33774         2.35      NA


Sample Size Used: 34



Simulations: 1500
Mediation Analysis Results for Case 16 :
Call:
lm(formula = Panas...1 ~ BFI..O., data = data)


Residuals:
    Min      1Q  Median      3Q     Max
-0.6667 -0.2000  0.3333  0.3333  0.8000


Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.6000     0.4098   6.345 4.01e-07 ***
BFI..O.      -0.4667     0.1752  -2.664    0.012 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1


Residual standard error: 0.4655 on 32 degrees of freedom
Multiple R-squared:  0.1815,    Adjusted R-squared:  0.1559
F-statistic: 7.095 on 1 and 32 DF,  p-value: 0.012
Call:
lm(formula = PAQ ~ BFI..O., data = data)


Residuals:
    Min      1Q  Median      3Q     Max
-0.7000 -0.5833  0.3000  0.4167  1.4167


Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   1.3500     0.5809   2.324   0.0266 *
BFI..O.       0.1167     0.2484   0.470   0.6417
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1


Residual standard error: 0.6599 on 32 degrees of freedom
Multiple R-squared:  0.006848, Adjusted R-squared:  -0.02419
F-statistic: 0.2207 on 1 and 32 DF,  p-value: 0.6417
```

```
Call:
lm(formula = Panas...1 ~ BFI..O. + PAQ, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.7345 -0.2488  0.1029  0.4282  0.7512

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)   2.3804     0.4380   5.435 6.17e-06 ***
BFI..O.      -0.4856     0.1738  -2.794  0.00884 **
PAQ           0.1627     0.1233   1.320  0.19664
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.4602 on 31 degrees of freedom
Multiple R-squared:  0.225,    Adjusted R-squared:  0.175
F-statistic:   4.5 on 2 and 31 DF,  p-value: 0.01923
```

Running nonparametric bootstrap

```
Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

               Estimate 95% CI Lower 95% CI Upper p-value
ACME             0.0190      -0.0665         0.11  0.6480
ADE             -0.4856      -0.7699        -0.17  0.0053 **
Total Effect    -0.4667      -0.7586        -0.15  0.0093 **
Prop. Mediated  -0.0407      -0.4271         0.18  0.6573
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Sample Size Used: 34


Simulations: 1500
Mediation Analysis Results for Case 17 :
Call:
lm(formula = Panas...1 ~ EI..Self.A., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.5886 -0.5245  0.4188  0.4607  0.6235

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 1.149591   0.840840   1.367    0.181
EI..Self.A. 0.004933   0.010860   0.454    0.653

Residual standard error: 0.5128 on 32 degrees of freedom
Multiple R-squared:  0.006406, Adjusted R-squared:  -0.02464
F-statistic: 0.2063 on 1 and 32 DF,  p-value: 0.6527
```

```
Call:
lm(formula = PAQ ~ EI..Self.A., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.7746 -0.6098  0.2254  0.4137  1.5079

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  2.82617    1.06414   2.656   0.0122 *
EI..Self.A. -0.01570    0.01374  -1.142   0.2620
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.649 on 32 degrees of freedom
Multiple R-squared:  0.03916,   Adjusted R-squared:  0.009129
F-statistic: 1.304 on 1 and 32 DF,  p-value: 0.262
Call:
lm(formula = Panas...1 ~ EI..Self.A. + PAQ, data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.6317 -0.5056  0.2342  0.4866  0.6160

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 0.718750   0.926030   0.776    0.444
EI..Self.A. 0.007325   0.011045   0.663    0.512
PAQ         0.152447   0.139251   1.095    0.282

Residual standard error: 0.5113 on 31 degrees of freedom
Multiple R-squared:  0.04339,   Adjusted R-squared:  -0.01833
F-statistic: 0.703 on 2 and 31 DF,  p-value: 0.5028
Running nonparametric bootstrap



Causal Mediation Analysis

Nonparametric Bootstrap Confidence Intervals with the Percentile Method

               Estimate 95% CI Lower 95% CI Upper p-value
ACME           -0.00239     -0.00978         0.01    0.59
ADE             0.00733     -0.01092         0.04    0.38
Total Effect    0.00493     -0.01143         0.04    0.57
Prop. Mediated -0.48506     -5.45459         3.90    0.99

Sample Size Used: 34


Simulations: 1500
Mediation Analysis Results for Case 18 :
```

```
Call:
lm(formula = Panas...1 ~ EI..Self.M., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.8471 -0.4651  0.2261  0.3910  0.6867

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 0.842224   0.363474   2.317   0.0271 *
EI..Self.M. 0.010468   0.005389   1.943   0.0609 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.4866 on 32 degrees of freedom
Multiple R-squared:  0.1055,    Adjusted R-squared:  0.07753
F-statistic: 3.773 on 1 and 32 DF,  p-value: 0.06092
Call:
lm(formula = PAQ ~ EI..Self.M., data = data)

Residuals:
    Min      1Q  Median      3Q     Max
-0.7516 -0.5779  0.2301  0.4064  1.4573

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  1.960531   0.490648   3.996 0.000354 ***
EI..Self.M. -0.005223   0.007274  -0.718 0.477955
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.6569 on 32 degrees of freedom
Multiple R-squared:  0.01586,   Adjusted R-squared:  -0.0149
F-statistic: 0.5156 on 1 and 32 DF,  p-value: 0.478
```

```
Error in eval(predvars, data, env): object 'EI..Self.M..' not found
Traceback:

1. lm(Panas...1 ~ EI..Self.M.. + PAQ, data)
2. eval(mf, parent.frame())
3. eval(mf, parent.frame())
4. stats::model.frame(formula = Panas...1 ~ EI..Self.M.. + PAQ,
 .     data = data, drop.unused.levels = TRUE)
5. model.frame.default(formula = Panas...1 ~ EI..Self.M.. + PAQ,
 .     data = data, drop.unused.levels = TRUE)
6. eval(predvars, data, env)
7. eval(predvars, data, env)
```

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