

```
In [1]: 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 dependency '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

Running nonparametric bootstrap

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

[illegible]

[illegible]

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


[illegible]

[illegible]

```
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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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.
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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):
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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"
```

```
"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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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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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.
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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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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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"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"

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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.M, 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"
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.
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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.  
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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.  
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):  
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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"
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[illegible]

[illegible]

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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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"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"
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.
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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.
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.
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Warning message in predict.lm(new.fit.M, 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.M, 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.
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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.
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c):
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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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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"

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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):  
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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.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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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.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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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	0.00563	-0.02439	0.05	0.59
ADE	0.00427	-0.02083	0.04	0.41
Total Effect	0.00990	-0.06061	0.07	0.68
Prop. Mediated	0.56838	-1.74375	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	-6.03e-02	0.01	0.64
ADE	9.25e-02	-4.44e-16	0.32	0.25
Total Effect	8.49e-02	-4.44e-16	0.28	0.37
Prop. Mediated	-8.96e-02	-4.32e+00	1.00	NA

Sample Size Used: 34

Simulations: 1500

```
In [3]: #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

```
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):
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c):
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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"
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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.
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):
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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):
"prediction from a rank-deficient fit may be misleading"
```

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[illegible]

```
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):
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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.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.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"
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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):
"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.
```

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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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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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t):
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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.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"  
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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.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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"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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[illegible]

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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.
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t):
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c):
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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):
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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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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.
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	-4.15e-02	0.02	0.55
ADE	6.94e-03	-2.15e-02	0.05	0.45
Total Effect	2.65e-17	-6.06e-02	0.06	0.86
Prop. Mediated	-2.62e+14	-3.35e+14	4.60	NA

Sample Size Used: 34

Simulations: 1500

```

In [4]: #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	-1.47e-02	0.01	0.80
ADE	7.77e-02	-4.51e-16	0.27	0.12
Total Effect	7.92e-02	-4.24e-16	0.27	0.31
Prop. Mediated	1.87e-02	-2.01e-01	1.00	NA

Sample Size Used: 34

Simulations: 500

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

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

model.M <- lm(PAQ ~ BFI..0., data)
summary(model.M)

model.Y <- lm(Panas.. ~ BFI..0. + PAQ, data)
summary(model.Y)

results <- mediate(model.M, model.Y, treat='BFI..0.', mediator='PAQ',
                   boot=TRUE, sims=1500)
summary(results)
```

Mediation Analysis Results for Case 5 :

Call:

```
lm(formula = Panas.. ~ BFI..0., 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..0.	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..0., 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..0.	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..0. + 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..0.	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	-7.91e-03	0.02	0.63
ADE	9.75e-02	-5.22e-16	0.34	0.17
Total Effect	1.00e-01	-5.55e-16	0.33	0.17
Prop. Mediated	2.51e-02	-4.17e-01	0.72	NA

Sample Size Used: 34

Simulations: 1500

```
In [6]: #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	-2.87e-03	0.00	0.44
ADE	4.45e-04	-4.61e-03	0.00	0.46
Total Effect	-7.84e-17	-3.24e-03	0.00	0.76
Prop. Mediated	5.68e+12	-1.48e+01	8.09	NA

Sample Size Used: 34

Simulations: 1500

```
In [7]: #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	-0.000214	-0.002420	0.00	0.38
ADE	-0.000103	-0.002708	0.00	0.60
Total Effect	-0.000317	-0.002925	0.00	0.47
Prop. Mediated	0.675765	-8.403419	6.58	NA

Sample Size Used: 34

Simulations: 1500

```
In [10]: #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	-4.35e-03	0.0	0.13
ADE	6.46e-04	-8.96e-04	0.0	0.21
Total Effect	-9.38e-05	-2.03e-03	0.0	0.67
Prop. Mediated	7.88e+00	-2.08e+01	27.5	NA

Sample Size Used: 34

Simulations: 1500

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

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	-0.01427	0.01	0.82
ADE	-0.03556	-0.12814	0.00	0.22
Total Effect	-0.03590	-0.12180	0.00	0.37
Prop. Mediated	0.00947	-0.27049	1.00	NA

Sample Size Used: 34

Simulations: 1500

```
In [12]: #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.
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"
```

[illegible]

[illegible]

```
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):
```



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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.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.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.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.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.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"
```

[illegible]

```
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.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.
```

```
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	-0.01189	0.03	0.749
ADE	-0.25477	-1.00000	0.00	0.081 .
Total Effect	-0.25000	-1.00000	0.00	0.084 .
Prop. Mediated	-0.01909	-1.50481	1.00	NA

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

Sample Size Used: 34

Simulations: 1500

```
In [ ]: #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)
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)

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")

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)
```

In []:

In []:

In []:

In []:

In []:

In []: