

# Serial Mediation Analysis R

## Notes

1. The author accepts no responsibility for the topicality, correctness, completeness, or quality of the information provided.
2. This pdf is part of a YouTube tutorial: <https://youtu.be/tDKD54Uv6RM>
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## Step 1

```
library(boot)
```

```
## Warning: package 'boot' was built under R version 4.1.3
```

```
Serial_Mediation_function<-function(data_used,i)
{
  # Sample a data
  data_temp=data_used[i,]

  # a path
  result_a<-lm(M1~X, data = data_temp)
  a_0<-result_a$coefficients[1]
  a_1<-result_a$coefficients[2]

  # d path
  result_d<-lm(M2~M1+X, data = data_temp)
  d_0<-result_d$coefficients[1]
  d_1<-result_d$coefficients[2]
  d_2<-result_d$coefficients[3]

  # b path
  result_b<-lm(Y~M2+M1+X, data = data_temp)
  b_0<-result_b$coefficients[1]
  b_1<-result_b$coefficients[2]
  b_2<-result_b$coefficients[3]
  c_1_apostrophe<-result_b$coefficients[4]

  #calculating the indirect effect
  indirect_effect<-a_1*d_1*b_1
  return(indirect_effect)
}
```

## Step 2

```
Mediation_data <- read.csv('https://raw.githubusercontent.com/tidydatayt/serial_mediation_R/main/df_serial_mediation_data.csv')
head(Mediation_data)
```

```
##   X.1      X      M1      M2      Y
## 1   1 1.6589330 3.230957 11.99716 46.35009
## 2   2 3.5024245 6.178766 28.37735 104.33976
## 3   3 2.5283077 7.051897 23.85784  88.20432
## 4   4 2.5421914 6.072521 21.20176  77.93777
## 5   5 1.8633266 4.127025 17.10519  62.61427
## 6   6 0.8632661 2.548584 10.36870  37.60888
```

## Step 3

```
# use boot() to do bootstrapping mediation analysis
boot_mediation <- boot(Mediation_data, Serial_Mediation_function, R=5000)

# print out confidence intervals
boot.ci(boot.out = boot_mediation, type = c("norm", "perc"))
```

```
## BOOTSTRAP CONFIDENCE INTERVAL CALCULATIONS
## Based on 5000 bootstrap replicates
##
## CALL :
## boot.ci(boot.out = boot_mediation, type = c("norm", "perc"))
##
## Intervals :
## Level      Normal      Percentile
## 95%   (15.70, 18.97 )   (15.75, 18.96 )
## Calculations and Intervals on Original Scale
```