betaMC: Staging

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Staging...

References

R Core Team. (2022). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Vienna, Austria. https://www.R-project.org/

1 Standardized Slopes

```
df <- nas1982
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = df)
mvn <- BetaMC(object, type = "mvn")
adf <- BetaMC(object, type = "adf")
hc3 <- BetaMC(object, type = "hc3")
summary(mvn)
summary(adf)
summary(hc3)
coef(mvn)
coef(adf)
coef(hc3)
vcov(mvn)
vcov(adf)
vcov(hc3)
confint(mvn)
confint(adf)
confint(hc3)
```

2 Multiple Correlation

```
df <- nas1982
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = df)
std_mvn <- BetaMC(object, type = "mvn")
```

```r
std_adf <- BetaMC(object, type = "adf")
std_hc3 <- BetaMC(object, type = "hc3")
mvn <- RSqBetaMC(std_mvn)
adf <- RSqBetaMC(std_adf)
hc3 <- RSqBetaMC(std_hc3)
summary(mvn)

#> Multiple correlation
#> type = "mvn"
#>        est     se     R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0559 20000 0.5039 0.6010 0.6622 0.8799 0.9015 0.9247
#> adj 0.7906 0.0599 20000 0.4684 0.5725 0.6380 0.8713 0.8944 0.9193

summary(adf)

#> Multiple correlation
#> type = "adf"
#>        est     se     R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0559 20000 0.5450 0.6074 0.6611 0.8809 0.9037 0.9258
#> adj 0.7906 0.0599 20000 0.5125 0.5793 0.6369 0.8724 0.8968 0.9205

summary(hc3)

#> Multiple correlation
#> type = "hc3"
#>        est     se     R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> rsq 0.8045 0.0621 20000 0.4775 0.5715 0.6468 0.8876 0.9113 0.9353
#> adj 0.7906 0.0665 20000 0.4402 0.5409 0.6215 0.8796 0.9050 0.9306

coef(mvn)

#>       rsq       adj
#> 0.8045263 0.7905638

coef(adf)

#>       rsq       adj
#> 0.8045263 0.7905638

coef(hc3)

#>       rsq       adj
#> 0.8045263 0.7905638

vcov(mvn)

#>             rsq         adj
#> rsq 0.003124727 0.003347922
#> adj 0.003347922 0.003587059
```

```
vcov(adf)

#>              rsq         adj
#> rsq 0.003125566 0.003348821
#> adj 0.003348821 0.003588022

vcov(hc3)

#>              rsq         adj
#> rsq 0.003850878 0.004125941
#> adj 0.004125941 0.004420651

confint(mvn)

#>          2.5%     97.5%
#> rsq 0.6621765 0.8799038
#> adj 0.6380462 0.8713255

confint(adf)

#>          2.5%     97.5%
#> rsq 0.6611051 0.8808870
#> adj 0.6368983 0.8723789

confint(hc3)

#>          2.5%    97.5%
#> rsq 0.6467515 0.887594
#> adj 0.6215194 0.879565
```

3 Differences of Standardized Slopes

```
df <- nas1982
object <- lm(QUALITY ~ NARTIC + PCTGRT + PCTSUPP, data = df)
std_mvn <- BetaMC(object, type = "mvn")
std_adf <- BetaMC(object, type = "adf")
std_hc3 <- BetaMC(object, type = "hc3")
mvn <- DiffBetaMC(std_mvn)
adf <- DiffBetaMC(std_adf)
hc3 <- DiffBetaMC(std_hc3)
summary(mvn)

#> Difference between standardized regression coefficients
#> type = "mvn"
#>                   est     se     R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
```

```
#> NARTIC-PCTGRT  0.1037 0.1352 20000 -0.3548 -0.2474 -0.1654 0.3622 0.4479 0.5320
#> NARTIC-PCTSUPP 0.2319 0.1252 20000 -0.2113 -0.0994 -0.0235 0.4686 0.5397 0.6183
#> PCTGRT-PCTSUPP 0.1282 0.1226 20000 -0.2757 -0.1837 -0.1129 0.3674 0.4415 0.5319

summary(adf)

#> Difference between standardized regression coefficients
#> type = "adf"
#>                    est     se     R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1212 20000 -0.3116 -0.2093 -0.1340 0.3391 0.4125 0.5187
#> NARTIC-PCTSUPP 0.2319 0.1184 20000 -0.1461 -0.0720 -0.0043 0.4627 0.5363 0.6053
#> PCTGRT-PCTSUPP 0.1282 0.1214 20000 -0.2845 -0.1900 -0.1111 0.3647 0.4408 0.5213

summary(hc3)

#> Difference between standardized regression coefficients
#> type = "hc3"
#>                    est     se     R   0.05%    0.5%    2.5%  97.5%  99.5% 99.95%
#> NARTIC-PCTGRT  0.1037 0.1438 20000 -0.4110 -0.2705 -0.1800 0.3827 0.4684 0.5437
#> NARTIC-PCTSUPP 0.2319 0.1338 20000 -0.2324 -0.1240 -0.0390 0.4811 0.5642 0.6643
#> PCTGRT-PCTSUPP 0.1282 0.1375 20000 -0.3341 -0.2409 -0.1465 0.3914 0.4698 0.5650

coef(mvn)

#>  NARTIC-PCTGRT NARTIC-PCTSUPP PCTGRT-PCTSUPP
#>      0.1036564      0.2318974      0.1282410

coef(adf)

#>  NARTIC-PCTGRT NARTIC-PCTSUPP PCTGRT-PCTSUPP
#>      0.1036564      0.2318974      0.1282410

coef(hc3)

#>  NARTIC-PCTGRT NARTIC-PCTSUPP PCTGRT-PCTSUPP
#>      0.1036564      0.2318974      0.1282410

vcov(mvn)

#>                NARTIC-PCTGRT NARTIC-PCTSUPP PCTGRT-PCTSUPP
#> NARTIC-PCTGRT    0.018274446    0.009457467   -0.008816979
#> NARTIC-PCTSUPP   0.009457467    0.015673309    0.006215843
#> PCTGRT-PCTSUPP  -0.008816979    0.006215843    0.015032822

vcov(adf)

#>                NARTIC-PCTGRT NARTIC-PCTSUPP PCTGRT-PCTSUPP
#> NARTIC-PCTGRT    0.014684206    0.006988478   -0.007695729
#> NARTIC-PCTSUPP   0.006988478    0.014024433    0.007035956
#> PCTGRT-PCTSUPP  -0.007695729    0.007035956    0.014731684
```

```r
vcov(hc3)

#>                 NARTIC-PCTGRT NARTIC-PCTSUPP PCTGRT-PCTSUPP
#> NARTIC-PCTGRT    0.020678100    0.009834027   -0.010844073
#> NARTIC-PCTSUPP   0.009834027    0.017899712    0.008065685
#> PCTGRT-PCTSUPP  -0.010844073    0.008065685    0.018909758

confint(mvn)

#>                         2.5%     97.5%
#> NARTIC-PCTGRT  -0.16536686 0.3621956
#> NARTIC-PCTSUPP -0.02352486 0.4685713
#> PCTGRT-PCTSUPP -0.11286011 0.3673944

confint(adf)

#>                          2.5%     97.5%
#> NARTIC-PCTGRT  -0.134035645 0.3390986
#> NARTIC-PCTSUPP -0.004267218 0.4626725
#> PCTGRT-PCTSUPP -0.111111500 0.3646886

confint(hc3)

#>                         2.5%     97.5%
#> NARTIC-PCTGRT  -0.18003751 0.3827233
#> NARTIC-PCTSUPP -0.03897954 0.4810736
#> PCTGRT-PCTSUPP -0.14652157 0.3914047
```