semmcci: Internal Tests

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Tests

```
#> test-semmcci-mc-latent-med-defined-none
#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-latent-med-defined

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-latent-med-std-defined-none

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-latent-med-std-defined

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-moment

#> Test passed

#> test-semmcci-mc-simple-med-defined-equality

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-simple-med-defined-inequality

#> Test passed
#> Test passed
#> Test passed
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```
#> test-semmcci-mc-simple-med-defined-meanstructure

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-simple-med-defined-mi-amelia

#> Test passed

#> test-semmcci-mc-simple-med-defined-mi-list

#> Test passed

#> test-semmcci-mc-simple-med-defined-mi-mice

#> Test passed

#> test-semmcci-mc-simple-med-defined-none

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-simple-med-defined

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-simple-med-std-defined-meanstructure

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-simple-med-std-defined-none-random-x

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-simple-med-std-defined-none

#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-mc-simple-med-std-defined

#> Test passed
#> Test passed
#> Test passed
```

```
#> test-semmcci-mc-methods

#> Monte Carlo Confidence Intervals
#>                    est     se   R   0.05%   0.5%    2.5%  97.5%  99.5% 99.95%
#> visual=~x1      1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> visual=~x2      0.5535 0.0928 100 0.3658 0.3670 0.3745 0.7232 0.7398 0.7460
#> visual=~x3      0.7294 0.0973 100 0.4947 0.5013 0.5245 0.9177 0.9398 0.9412
#> textual=~x4     1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> textual=~x5     1.1131 0.0642 100 0.9320 0.9528 0.9962 1.2329 1.2754 1.2811
#> textual=~x6     0.9261 0.0484 100 0.8109 0.8152 0.8279 1.0056 1.0125 1.0148
#> speed=~x7       1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> speed=~x8       1.1800 0.1594 100 0.8162 0.8251 0.8491 1.4741 1.5203 1.5543
#> speed=~x9       1.0815 0.1567 100 0.7791 0.7906 0.8194 1.3888 1.4788 1.5265
#> x1~~x1          0.5491 0.1034 100 0.3079 0.3117 0.3323 0.7522 0.7755 0.7872
#> x2~~x2          1.1338 0.1131 100 0.7719 0.8168 0.9233 1.3194 1.4047 1.4192
#> x3~~x3          0.8443 0.0781 100 0.6700 0.6867 0.7098 0.9960 1.0268 1.0270
#> x4~~x4          0.3712 0.0493 100 0.2245 0.2347 0.2732 0.4473 0.4824 0.5012
#> x5~~x5          0.4463 0.0582 100 0.3240 0.3295 0.3503 0.5834 0.5951 0.5976
#> x6~~x6          0.3562 0.0388 100 0.2716 0.2720 0.2757 0.4239 0.4467 0.4643
#> x7~~x7          0.7994 0.0862 100 0.5388 0.5737 0.6500 0.9341 0.9605 0.9726
#> x8~~x8          0.4877 0.0821 100 0.3131 0.3165 0.3519 0.6569 0.7233 0.7322
#> x9~~x9          0.5661 0.0781 100 0.3889 0.3943 0.4098 0.7087 0.7472 0.7640
#> visual~~visual  0.8093 0.1452 100 0.4650 0.4807 0.5665 1.0951 1.1401 1.1515
#> textual~~textual 0.9795 0.1167 100 0.7401 0.7406 0.7632 1.1797 1.2478 1.2532
#> speed~~speed    0.3837 0.0860 100 0.1194 0.1475 0.2143 0.5283 0.5685 0.5821
#> visual~~textual 0.4082 0.0735 100 0.1955 0.2064 0.2453 0.5262 0.5619 0.5773
#> visual~~speed   0.2622 0.0589 100 0.0938 0.1169 0.1536 0.3689 0.4061 0.4121
#> textual~~speed  0.1735 0.0526 100 0.0173 0.0279 0.0595 0.2888 0.3019 0.3037
#> Monte Carlo Confidence Intervals (Multiple Imputation Estimates)
#>                    est     se   R   0.05%   0.5%    2.5%  97.5%  99.5% 99.95%
#> visual=~x1      1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> visual=~x2      0.5535 0.1016 100 0.2779 0.2866 0.3289 0.7385 0.7644 0.7795
#> visual=~x3      0.7294 0.1108 100 0.4748 0.4789 0.5147 0.9321 0.9598 0.9696
#> textual=~x4     1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> textual=~x5     1.1131 0.0630 100 0.9293 0.9334 0.9942 1.2242 1.2268 1.2272
#> textual=~x6     0.9261 0.0568 100 0.7393 0.7653 0.8114 1.0145 1.0708 1.0974
#> speed=~x7       1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> speed=~x8       1.1800 0.1660 100 0.7485 0.8043 0.8887 1.4708 1.4920 1.4971
#> speed=~x9       1.0815 0.1478 100 0.7465 0.7555 0.7928 1.3002 1.3722 1.3824
#> x1~~x1          0.5491 0.1148 100 0.2997 0.3090 0.3352 0.7697 0.8368 0.8821
#> x2~~x2          1.1338 0.1094 100 0.8242 0.8499 0.9218 1.3138 1.3801 1.3984
#> x3~~x3          0.8443 0.0891 100 0.5839 0.6102 0.6797 0.9903 1.0118 1.0209
#> x4~~x4          0.3712 0.0500 100 0.2221 0.2405 0.2806 0.4580 0.5061 0.5099
#> x5~~x5          0.4463 0.0569 100 0.3185 0.3219 0.3461 0.5652 0.5835 0.5939
#> x6~~x6          0.3562 0.0412 100 0.2533 0.2618 0.2893 0.4297 0.4626 0.4806
#> x7~~x7          0.7994 0.0831 100 0.5797 0.5944 0.6217 0.9245 0.9561 0.9822
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#> x8~~x8           0.4877 0.0758 100 0.3171 0.3187 0.3335 0.6316 0.6428 0.6448
#> x9~~x9           0.5661 0.0735 100 0.3955 0.4139 0.4424 0.6957 0.7261 0.7390
#> visual~~visual   0.8093 0.1575 100 0.4702 0.4724 0.5042 1.1152 1.1960 1.1978
#> textual~~textual 0.9795 0.1054 100 0.7298 0.7337 0.8247 1.1905 1.2585 1.2974
#> speed~~speed     0.3837 0.0904 100 0.1679 0.1764 0.2008 0.5643 0.5883 0.6038
#> visual~~textual  0.4082 0.0709 100 0.2760 0.2782 0.2847 0.5535 0.5873 0.5925
#> visual~~speed    0.2622 0.0583 100 0.1080 0.1180 0.1396 0.3713 0.3891 0.4015
#> textual~~speed   0.1735 0.0461 100 0.0447 0.0572 0.0871 0.2602 0.2822 0.2847
#> Standardized Monte Carlo Confidence Intervals
#>                    est     se   R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> visual=~x1        0.7719 0.0533 100 0.6157 0.6231 0.6659 0.8635 0.8744 0.8809
#> visual=~x2        0.4236 0.0577 100 0.2906 0.2912 0.2988 0.5311 0.5899 0.6038
#> visual=~x3        0.5811 0.0483 100 0.4312 0.4402 0.4732 0.6510 0.6749 0.6926
#> textual=~x4       0.8516 0.0242 100 0.7944 0.7973 0.8008 0.8945 0.9150 0.9201
#> textual=~x5       0.8551 0.0220 100 0.7895 0.7918 0.8088 0.8936 0.9060 0.9125
#> textual=~x6       0.8380 0.0225 100 0.7871 0.7876 0.7915 0.8767 0.8818 0.8833
#> speed=~x7         0.5695 0.0587 100 0.3748 0.3920 0.4402 0.6542 0.6869 0.7104
#> speed=~x8         0.7230 0.0557 100 0.5709 0.5745 0.5935 0.8057 0.8220 0.8246
#> speed=~x9         0.6650 0.0593 100 0.5068 0.5070 0.5329 0.7640 0.7777 0.7815
#> x1~~x1            0.4042 0.0816 100 0.2240 0.2354 0.2544 0.5566 0.6117 0.6209
#> x2~~x2            0.8206 0.0492 100 0.6354 0.6517 0.7179 0.9107 0.9152 0.9156
#> x3~~x3            0.6623 0.0547 100 0.5203 0.5441 0.5762 0.7759 0.8061 0.8140
#> x4~~x4            0.2748 0.0412 100 0.1535 0.1628 0.1999 0.3586 0.3642 0.3689
#> x5~~x5            0.2689 0.0374 100 0.1673 0.1791 0.2015 0.3458 0.3731 0.3768
#> x6~~x6            0.2977 0.0375 100 0.2198 0.2225 0.2314 0.3735 0.3797 0.3804
#> x7~~x7            0.6757 0.0642 100 0.4952 0.5274 0.5720 0.8062 0.8460 0.8594
#> x8~~x8            0.4772 0.0783 100 0.3200 0.3244 0.3509 0.6477 0.6700 0.6741
#> x9~~x9            0.5578 0.0774 100 0.3893 0.3952 0.4163 0.7158 0.7430 0.7432
#> visual~~visual   1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> textual~~textual 1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> speed~~speed     1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> visual~~textual  0.4585 0.0660 100 0.2889 0.2949 0.3093 0.5686 0.5799 0.5850
#> visual~~speed    0.4705 0.0828 100 0.2175 0.2542 0.3355 0.6285 0.6681 0.6952
#> textual~~speed   0.2830 0.0749 100 0.0457 0.0639 0.1386 0.4219 0.4619 0.4799
#> Standardized Monte Carlo Confidence Intervals
#>                    est     se   R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> visual=~x1        0.7719 0.0591 100 0.6208 0.6228 0.6426 0.8714 0.8816 0.8849
#> visual=~x2        0.4236 0.0626 100 0.2568 0.2570 0.2842 0.5341 0.5535 0.5582
#> visual=~x3        0.5811 0.0534 100 0.4245 0.4373 0.4646 0.6588 0.6757 0.6843
#> textual=~x4       0.8516 0.0224 100 0.7929 0.7959 0.8086 0.8910 0.9080 0.9189
#> textual=~x5       0.8551 0.0210 100 0.8008 0.8030 0.8124 0.8867 0.8955 0.9015
#> textual=~x6       0.8380 0.0198 100 0.7910 0.7932 0.8025 0.8790 0.8837 0.8859
#> speed=~x7         0.5695 0.0575 100 0.4086 0.4189 0.4414 0.6663 0.6911 0.7005
#> speed=~x8         0.7230 0.0535 100 0.5880 0.5952 0.6155 0.8101 0.8319 0.8395
#> speed=~x9         0.6650 0.0556 100 0.5052 0.5298 0.5605 0.7568 0.7711 0.7732
#> x1~~x1            0.4042 0.0900 100 0.2170 0.2228 0.2406 0.5871 0.6121 0.6146
```

```
#> x2~~x2          0.8206 0.0511 100 0.6884 0.6937 0.7146 0.9192 0.9340 0.9341
#> x3~~x3          0.6623 0.0605 100 0.5318 0.5434 0.5659 0.7841 0.8085 0.8198
#> x4~~x4          0.2748 0.0382 100 0.1556 0.1755 0.2061 0.3462 0.3666 0.3713
#> x5~~x5          0.2689 0.0357 100 0.1873 0.1981 0.2138 0.3401 0.3551 0.3588
#> x6~~x6          0.2977 0.0332 100 0.2152 0.2190 0.2274 0.3559 0.3708 0.3743
#> x7~~x7          0.6757 0.0648 100 0.5093 0.5223 0.5561 0.8051 0.8244 0.8330
#> x8~~x8          0.4772 0.0765 100 0.2952 0.3079 0.3437 0.6211 0.6457 0.6543
#> x9~~x9          0.5578 0.0731 100 0.4022 0.4054 0.4273 0.6858 0.7185 0.7446
#> visual~~visual   1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> textual~~textual 1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> speed~~speed     1.0000 0.0000 100 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000
#> visual~~textual  0.4585 0.0604 100 0.3252 0.3323 0.3486 0.5835 0.6110 0.6173
#> visual~~speed    0.4705 0.0662 100 0.3101 0.3294 0.3579 0.5829 0.6428 0.6477
#> textual~~speed   0.2830 0.0647 100 0.0899 0.1108 0.1599 0.4065 0.4185 0.4222
#> Monte Carlo Confidence Intervals
#> Monte Carlo Confidence Intervals (Multiple Imputation Estimates)
#> Standardized Monte Carlo Confidence Intervals
#> Standardized Monte Carlo Confidence Intervals

#> test-semmcci-npd

#> Test passed
#> Test passed
#> Test passed
#> Test passed

#> test-semmcci-zzz-coverage
#> test-semmcci-zzz-heywood

#> lavaan 0.6.15 ended normally after 18 iterations
#>
#>   Estimator                                         ML
#>   Optimization method                           NLMINB
#>   Number of model parameters                         8
#>
#>   Number of observations                            50
#>
#> Model Test User Model:
#>
#>   Test statistic                                 0.000
#>   Degrees of freedom                                 2
#>   P-value (Chi-square)                           1.000
#>
#> Parameter Estimates:
#>
#>   Standard errors                             Standard
#>   Information                                 Expected
```

```
#>    Information saturated (h1) model         Structured
#>
#> Latent Variables:
#>                   Estimate  Std.Err  z-value  P(>|z|)
#>   eta1 =~
#>     y1               1.000
#>     y2               0.991    0.152    6.524    0.000
#>     y3               0.901    0.138    6.537    0.000
#>     y4               1.399    0.143    9.814    0.000
#>
#> Variances:
#>                   Estimate  Std.Err  z-value  P(>|z|)
#>    .y1               0.000    0.055    0.000    1.000
#>    .y2               0.980    0.203    4.822    0.000
#>    .y3               0.807    0.167    4.820    0.000
#>    .y4               0.696    0.176    3.960    0.000
#>     eta1             0.980    0.204    4.815    0.000
#>
#> Standardized Monte Carlo Confidence Intervals
#>              est se R 0.05% 0.5% 2.5% 97.5% 99.5% 99.95%
#> eta1=~y1   1.0000 NA 0   NA   NA   NA    NA    NA     NA
#> eta1=~y2   0.7039 NA 0   NA   NA   NA    NA    NA     NA
#> eta1=~y3   0.7047 NA 0   NA   NA   NA    NA    NA     NA
#> eta1=~y4   0.8566 NA 0   NA   NA   NA    NA    NA     NA
#> y1~~y1     0.0000 NA 0   NA   NA   NA    NA    NA     NA
#> y2~~y2     0.5045 NA 0   NA   NA   NA    NA    NA     NA
#> y3~~y3     0.5034 NA 0   NA   NA   NA    NA    NA     NA
#> y4~~y4     0.2662 NA 0   NA   NA   NA    NA    NA     NA
#> eta1~~eta1 1.0000 NA 0   NA   NA   NA    NA    NA     NA
#> [[1]]
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#> [[1]][[1]]$value
#> [[1]][[1]]$value[[1]]
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#>
#>
#> [[1]][[1]]$visible
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#>
#> [[1]][[2]]
#> [[1]][[2]]$value
#> [[1]][[2]]$value[[1]]
#> [1] TRUE
#>
```

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#> [[1]][[3]]$visible
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#>
#> [[1]][[4]]
#> [[1]][[4]]$value
#> [[1]][[4]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[4]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[5]]
#> [[1]][[5]]$value
#> [[1]][[5]]$value[[1]]
#> Monte Carlo Confidence Intervals
#>                                est      se     R     0.05%      0.5%      2.5%
#> ses=~education              1.0000  0.0000 20000    1.0000    1.0000    1.0000
#> ses=~sei                    5.2195  0.4248 20000    3.8353    4.1272    4.3971
#> alien67=~anomia67           1.0000  0.0000 20000    1.0000    1.0000    1.0000
#> alien67=~powerless67        0.9787  0.0617 20000    0.7794    0.8225    0.8579
#> alien71=~anomia71           1.0000  0.0000 20000    1.0000    1.0000    1.0000
#> alien71=~powerless71        0.9221  0.0594 20000    0.7238    0.7719    0.8059
#> alien71~alien67             0.6070  0.0510 20000    0.4349    0.4733    0.5077
#> alien71~ses                -0.2268  0.0524 20000   -0.4068   -0.3642   -0.3288
#> alien67~ses                -0.5750  0.0561 20000   -0.7588   -0.7209   -0.6867
#> anomia67~~anomia71          1.6229  0.3130 20000    0.6136    0.8173    1.0057
#> powerless67~~powerless71    0.3387  0.2619 20000   -0.5278   -0.3387   -0.1658
#> education~~education        2.8013  0.5062 20000    1.1724    1.5200    1.8072
#> sei~~sei                  264.5971 18.1177 20000  209.1080  217.8148  228.8225
#> anomia67~~anomia67          4.7307  0.4506 20000    3.2547    3.5702    3.8491
#> powerless67~~powerless67    2.5634  0.4030 20000    1.2929    1.5387    1.7855
#> anomia71~~anomia71          4.3992  0.5142 20000    2.7484    3.0903    3.3983
```

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```
#> powerless71~~powerless71    3.0699  0.4336 20000     1.6536   1.9815   2.2256
#> ses~~ses                    6.7983  0.6475 20000     4.7835   5.1492   5.5278
#> alien67~~alien67            4.8415  0.4681 20000     3.3552   3.6363   3.9143
#> alien71~~alien71            4.0832  0.4033 20000     2.7275   3.0295   3.2839
#>                               97.5%    99.5%   99.95%
#> ses=~education              1.0000   1.0000   1.0000
#> ses=~sei                    6.0549   6.3162   6.6130
#> alien67=~anomia67           1.0000   1.0000   1.0000
#> alien67=~powerless67        1.0994   1.1367   1.1800
#> alien71=~anomia71           1.0000   1.0000   1.0000
#> alien71=~powerless71        1.0389   1.0736   1.1149
#> alien71~alien67             0.7063   0.7380   0.7652
#> alien71~ses                -0.1244  -0.0947  -0.0553
#> alien67~ses                -0.4649  -0.4317  -0.3955
#> anomia67~~anomia71          2.2345   2.4434   2.6633
#> powerless67~~powerless71    0.8571   1.0169   1.1933
#> education~~education        3.7951   4.1042   4.4450
#> sei~~sei                  299.9381 310.8187 323.0384
#> anomia67~~anomia67          5.6175   5.8855   6.1737
#> powerless67~~powerless67    3.3638   3.6147   3.8562
#> anomia71~~anomia71          5.4112   5.7434   6.0764
#> powerless71~~powerless71    3.9226   4.1893   4.4509
#> ses~~ses                    8.0599   8.4564   8.9531
#> alien67~~alien67            5.7571   6.0571   6.4733
#> alien71~~alien71            4.8705   5.1313   5.3979
#>
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#> [[1]][[5]]$visible
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#>
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#>
```

```
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#>
#> [[1]][[8]]
#> [[1]][[8]]$value
#> [[1]][[8]]$value[[1]]
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#>
#>
#> [[1]][[8]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[9]]
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#>
#>
#> [[1]][[9]]$visible
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#>
#> [[1]][[10]]
#> [[1]][[10]]$value
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#> [1] TRUE
#>
#>
#> [[1]][[10]]$visible
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#>
#>
#> [[1]][[11]]
#> [[1]][[11]]$value
#> [[1]][[11]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[11]]$visible
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#>
#>
#> [[1]][[12]]
```

```
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#>
#> [[1]][[12]]$visible
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#>
#>
#> [[1]][[13]]
#> [[1]][[13]]$value
#> [[1]][[13]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[13]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[14]]
#> [[1]][[14]]$value
#> [[1]][[14]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[14]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[15]]
#> [[1]][[15]]$value
#> [[1]][[15]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[15]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[16]]
#> [[1]][[16]]$value
#> [[1]][[16]]$value[[1]]
#> [1] TRUE
#>
#>
```

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#> [[1]][[16]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[17]]
#> [[1]][[17]]$value
#> [[1]][[17]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[17]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[18]]
#> [[1]][[18]]$value
#> [[1]][[18]]$value[[1]]
#>                          2.5%      97.5%
#> visual=~x1          0.6425944 0.8713997
#> visual=~x2          0.2842331 0.5341463
#> visual=~x3          0.4645933 0.6588273
#> textual=~x4         0.8086065 0.8910231
#> textual=~x5         0.8123681 0.8866548
#> textual=~x6         0.8025489 0.8789873
#> speed=~x7           0.4414420 0.6662870
#> speed=~x8           0.6154922 0.8101200
#> speed=~x9           0.5605405 0.7567710
#> x1~~x1              0.2406465 0.5870657
#> x2~~x2              0.7146303 0.9192091
#> x3~~x3              0.5659418 0.7840939
#> x4~~x4              0.2060771 0.3461555
#> x5~~x5              0.2138428 0.3400580
#> x6~~x6              0.2273762 0.3559151
#> x7~~x7              0.5560616 0.8050773
#> x8~~x8              0.3436877 0.6210640
#> x9~~x9              0.4272659 0.6857929
#> visual~~visual      1.0000000 1.0000000
#> textual~~textual    1.0000000 1.0000000
#> speed~~speed        1.0000000 1.0000000
#> visual~~textual     0.3485602 0.5834751
#> visual~~speed       0.3578901 0.5828631
#> textual~~speed      0.1599254 0.4064753
#>
#>
#> [[1]][[18]]$visible
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#> [1] TRUE
#>
#>
#> [[1]][[19]]
#> [[1]][[19]]$value
#> [[1]][[19]]$value[[1]]
#> [[1]][[19]]$value[[1]]$thetahatstar
#>                    y1              y2              y3
#>    [1,]  1.1061788942  1.954840104  2.464236932
#>    [2,] -0.1063564581  1.659720573  0.788451095
#>    [3,]  1.1956922948  2.274313849  2.753152869
#>    [4,] -0.0940942210  0.417894862  0.114580578
#>    [5,]  1.7031035948  3.056394155  3.819906237
#>    [6,] -0.7323499872 -2.667917917 -2.393808240
#>    [7,]  0.1596883088  0.517374697  0.486249360
#>    [8,] -1.3323464922 -1.836647025 -2.680671103
#>    [9,] -0.3763629859 -1.022954139 -1.037013685
#>   [10,] -0.0530244630  0.218022493  0.054872932
#>   [11,] -1.1134567852 -1.016602591 -1.952629776
#>   [12,]  0.9771802369  2.105351736  2.386905892
#>   [13,]  0.1587364874 -0.101155568  0.141804057
#>   [14,] -0.8847744823 -1.616896073 -2.000605358
#>   [15,] -0.1699778536 -0.247715964 -0.349430905
#>   [16,] -1.8399657041 -2.581209847 -3.726863100
#>   [17,]  0.8365324341  1.890688989  2.092392113
#>   [18,]  0.7633708563  1.188642111  1.611554493
#>   [19,] -1.0595581441 -1.636124726 -2.229228116
#>   [20,] -1.0367334131 -2.596471202 -2.733718229
#>   [21,]  0.5963745833 -0.023112058  0.730840717
#>   [22,]  1.2545295521  0.703740168  1.954919093
#>   [23,] -0.7234888923 -2.765854802 -2.437109507
#>   [24,]  0.2443412686 -0.753203090 -0.113307602
#>   [25,]  0.4082934285  1.720689168  1.464044024
#>   [26,] -0.0985228661 -0.048431394 -0.149733400
#>   [27,] -0.1021450453 -0.420571408 -0.360772311
#>   [28,] -1.9011040049 -3.510124014 -4.318609785
#>   [29,]  0.8103487750  2.066692695  2.157416312
#>   [30,] -0.8168030550 -2.741266313 -2.539824782
#>   [31,]  0.2443497127  0.725306572  0.707213888
#>   [32,]  0.0467276071 -0.736851673 -0.350653455
#>   [33,]  0.0321486173 -0.534094413 -0.256311368
#>   [34,]  1.3993374001  1.035211467  2.319444218
#>   [35,]  0.7403442133  1.547607595  1.782051554
#>   [36,] -0.0655746402 -0.276991027 -0.235488662
#>   [37,] -2.5113709856 -3.429160114 -5.034668688
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#>     [38,] -0.8890900362 -1.499808128 -1.941007858
#>     [39,] -0.2334216056  0.507012768 -0.009701123
#>     [40,] -0.7293217130 -0.767134531 -1.335176847
#>     [41,] -0.4621087372 -0.342841240 -0.766502704
#>     [42,] -0.1811186592 -1.317219833 -0.956853132
#>     [43,] -0.5312745841 -0.939341538 -1.183783796
#>     [44,] -0.8269149958 -1.531921614 -1.881298491
#>     [45,] -0.1815009503  0.187892760 -0.122055368
#>     [46,]  0.1734184268  1.197187191  0.880638008
#>     [47,] -0.4580517738 -0.255794565 -0.713136493
#>     [48,]  0.5927850094  1.189814037  1.399487792
#>     [49,] -0.1618009791  0.653624008  0.160971438
#>     [50,] -0.0309612403 -1.502846239 -0.872624777
#>     [51,] -1.0779836183 -1.303524927 -2.067625344
#>     [52,]  0.7518661192  1.294735466  1.656085691
#>     [53,]  0.7049381857  1.220395763  1.556312092
#>     [54,]  0.6603818940  0.830152417  1.284182587
#>     [55,]  1.9291196870  5.001590235  5.181246077
#>     [56,]  0.9277434642  1.262936552  1.857754087
#>     [57,] -1.6991106421 -2.577877381 -3.549370331
#>     [58,] -0.2778818626 -1.531536730 -1.196451778
#>     [59,]  0.6051863356  0.059722092  0.787798278
#>     [60,] -1.0798297048 -1.626189993 -2.248992978
#>     [61,]  2.1485095712  3.071513111  4.383708793
#>     [62,] -1.7476941182 -2.760290350 -3.711184495
#>     [63,]  0.0169846801 -0.464494136 -0.236595249
#>     [64,]  1.9327906236  2.975597393  4.061482457
#>     [65,] -0.0807670641  1.057027701  0.485891237
#>     [66,]  0.3503353385  2.862028026  2.025166749
#>     [67,]  1.0972948418  1.262548942  2.068966090
#>     [68,]  2.7619858140  4.052275064  5.692982976
#>     [69,] -0.6683795339 -1.425891343 -1.624765643
#>     [70,]  0.6925464536  1.338211948  1.606242905
#>     [71,]  1.5347655122  2.761963789  3.446595555
#>     [72,]  1.3204721548  1.635859421  2.554435333
#>     [73,] -1.3217457596 -2.085697677 -2.805664891
#>     [74,] -0.4424733632 -0.795284950 -0.993105110
#>     [75,]  1.6880072673  2.017617606  3.224603931
#>     [76,] -0.5045482583 -1.370993037 -1.390005122
#>     [77,]  0.0113866386  0.624179813  0.360592569
#>     [78,] -1.7073862277 -2.833793000 -3.701712272
#>     [79,]  0.8019091132  0.875695354  1.485938566
#>     [80,] -2.0948672430 -3.168266078 -4.370511749
#>     [81,] -0.3756923527 -0.446917811 -0.716501375
#>     [82,] -0.9531469371 -1.501936246 -2.022066524
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#>    [83,] -0.1539114056  1.164645275  0.454404983
#>    [84,] -1.2741962524 -0.963390864 -2.123538332
#>    [85,]  0.8143875996  1.904303815  2.072333614
#>    [86,] -0.1688038721  0.262472965 -0.064833479
#>    [87,]  0.1552177180  0.283403646  0.350830487
#>    [88,] -0.8037148253 -2.246525776 -2.248943743
#>    [89,] -0.0808544257  0.361815691  0.099968740
#>    [90,] -0.9191810016 -2.039369293 -2.277964535
#>    [91,] -0.4000449855 -2.209902375 -1.725251231
#>    [92,] -2.1785110904 -3.627323047 -4.729571319
#>    [93,]  1.7505958074  3.050512590  3.875864035
#>    [94,]  0.5867981079  0.936583302  1.251489792
#>    [95,]  1.7368673002  3.591241408  4.158826722
#>    [96,]  0.8188538856  1.641544978  1.932082829
#>    [97,] -2.7153402917 -5.093476722 -6.212640289
#>    [98,] -0.7344160059 -0.389103912 -1.131738160
#>    [99,] -0.2964414942 -0.670727965 -0.741882436
#>   [100,]  1.7861279629  2.384959061  3.550817565
#>   [101,] -0.8825364753 -0.816846105 -1.553820373
#>   [102,]  1.3936519877  1.906713869  2.796001971
#>   [103,] -0.8138348412 -1.139621582 -1.647277712
#>   [104,]  0.6223188274  0.684968726  1.156147850
#>   [105,] -3.2987685443 -6.006376493 -7.446784571
#>   [106,] -0.6968202550 -1.514470919 -1.709388598
#>   [107,]  0.9639393603  1.842566551  2.224560013
#>   [108,] -1.0219514496 -1.597906308 -2.161123713
#>   [109,]  0.5269301245  0.030599154  0.674052367
#>   [110,] -0.2978263664 -0.895095131 -0.868123726
#>   [111,]  1.6930246314  2.755430668  3.640315841
#>   [112,]  0.8036243375  1.022674711  1.569644805
#>   [113,] -1.0686588655 -1.297167268 -2.052469333
#>   [114,]  0.0453506106  0.490901491  0.328981061
#>   [115,] -0.0666280027  0.122070206 -0.015339907
#>   [116,]  0.3648282113  0.215139513  0.574326760
#>   [117,] -1.9906646680 -3.900487585 -4.646925543
#>   [118,]  0.1059166249  0.128484708  0.203379504
#>   [119,]  0.5901185843  0.535331350  1.032952325
#>   [120,]  1.0632031990  1.627819451  2.229164345
#>   [121,] -0.6741534960 -0.665833841 -1.210165564
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#>   [123,]  0.6270020806  1.276839388  1.490451208
#>   [124,] -0.2251878440 -0.050089542 -0.308602247
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#>   [127,]  1.2498035295  2.457710062  2.922405695
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#>  [128,]   1.1568318954   3.890995162   3.601885186
#>  [129,]   0.9430007990   0.294922741   1.339572536
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#>  [131,]  -0.4200516065  -2.092412270  -1.684996990
#>  [132,]  -0.6734290603  -1.081848340  -1.440132837
#>  [133,]   0.3427907870  -0.226243815   0.301897275
#>  [134,]   0.0758754214   0.295965823   0.258863743
#>  [135,]  -0.1422164740  -1.051726903  -0.761005440
#>  [136,]  -0.9935808921  -2.917795380  -2.858229381
#>  [137,]  -1.7739738751  -1.292524748  -2.929406360
#>  [138,]  -0.8877343244  -1.055468608  -1.692727483
#>  [139,]   1.3041404559   3.286753147   3.450246936
#>  [140,]   0.3716813718   1.524652019   1.309597126
#>  [141,]   0.6490187295   0.831833646   1.270945965
#>  [142,]  -1.2870361117  -2.074762017  -2.756313834
#>  [143,]  -0.7708585822  -2.110892499  -2.132701888
#>  [144,]  -1.5902564336  -2.666975889  -3.463077295
#>  [145,]  -0.3198577253  -0.244037810  -0.534286827
#>  [146,]  -1.1431708709  -2.392829930  -2.753431188
#>  [147,]   0.5285133017   0.330533592   0.842477612
#>  [148,]  -0.4168508344  -0.498956828  -0.796704638
#>  [149,]   0.3945071633   0.423658095   0.727054891
#>  [150,]  -0.6758165213  -1.041295450  -1.420604796
#>  [151,]   1.2561528191   1.952375992   2.649883878
#>  [152,]  -0.8714294580  -0.534291429  -1.383164134
#>  [153,]  -1.1345532599  -2.483854457  -2.793200004
#>  [154,]  -0.0344178365   0.164510284   0.048377980
#>  [155,]  -0.7902740097  -2.023764539  -2.108560160
#>  [156,]   0.4573068428   0.129750671   0.642258495
#>  [157,]  -1.4429272906  -1.237715730  -2.486181310
#>  [158,]  -0.7198296471  -1.819582529  -1.907405009
#>  [159,]   3.1223406912   4.734664308   6.521035619
#>  [160,]   0.0491429343  -0.138530306  -0.015598283
#>  [161,]   0.6632322115   0.788631470   1.264694487
#>  [162,]  -0.6921601565  -2.907655180  -2.476736485
#>  [163,]  -1.3289630139  -2.653891918  -3.129988674
#>  [164,]   1.5252495270   2.372140367   3.218393638
#>  [165,]   0.8753447955   0.632426958   1.442507590
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#>  [169,]  -0.2314517111  -0.121338305  -0.355953242
#>  [170,]  -1.1971568116  -1.038438771  -2.069120167
#>  [171,]  -0.7457763757  -0.625434554  -1.277057921
#>  [172,]   0.0516619555  -0.665886752  -0.305117863
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#>   [173,] -0.3212567457  0.808968849  0.048343232
#>   [174,] -1.0606753199 -2.882961260 -2.922563286
#>   [175,] -0.3466536671 -0.215550791 -0.551891717
#>   [176,] -0.1014696588  0.219581391 -0.004672117
#>   [177,]  1.3159439784  1.065465822  2.232244223
#>   [178,] -1.4744507057 -2.209755489 -3.064931735
#>   [179,] -0.9818244839 -1.286335624 -1.938177521
#>   [180,] -1.9080883828 -3.787830296 -4.481434521
#>   [181,] -0.7049143469 -2.009704631 -1.994315741
#>   [182,] -0.1215374384  1.259467530  0.547397041
#>   [183,] -0.2319346683 -1.106288805 -0.903161769
#>   [184,] -0.9313635951 -0.969538969 -1.699444942
#>   [185,]  0.8756116763  1.890922478  2.141252707
#>   [186,]  1.2526170479  1.573258748  2.435080646
#>   [187,]  0.3165709162  1.444939375  1.196638332
#>   [188,]  1.2635545144  3.000765032  3.240925665
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#>   [191,]  0.8957286546  1.417812571  1.903781979
#>   [192,] -1.6440355951 -2.645916777 -3.518451887
#>   [193,]  1.9409408312  4.028001613  4.655685879
#>   [194,]  0.3525682695  0.402847188  0.663208764
#>   [195,] -2.4175675967 -5.210264857 -5.906136337
#>   [196,]  1.7376927997  3.265365113  3.979008402
#>   [197,] -0.7565610910 -1.586688762 -1.823962081
#>   [198,] -1.2438764132 -3.650066246 -3.576722463
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#>   [200,]  1.0606942602  1.996606002  2.430696845
#>   [201,]  0.4203745302 -0.140389750  0.446288032
#>   [202,] -0.8976685615 -1.276893336 -1.827996727
#>   [203,] -0.3921878863 -0.614234175 -0.829924545
#>   [204,] -0.4874216342 -1.061062014 -1.196649830
#>   [205,] -0.5779002988 -0.423322236 -0.955556003
#>   [206,]  0.0248861828  0.294486205  0.194460077
#>   [207,] -0.8978972690 -1.051889176 -1.703414033
#>   [208,] -3.0208320674 -6.073245050 -7.137312703
#>   [209,]  0.8324461614  1.194401391  1.700886149
#>   [210,]  0.6976220463  0.358939299  1.069116746
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#>   [212,]  1.1575404281  1.924031554  2.511186261
#>   [213,]  1.6647646928  2.639781726  3.540895953
#>   [214,]  0.3899508485 -0.056445530  0.454935848
#>   [215,]  0.8559334899  1.234021767  1.752162019
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#>   [217,] -1.6512025961 -3.636227543 -4.076970004
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#>   [218,]  -0.9494599571  -1.671256528  -2.111434602
#>   [219,]  -1.8494004441  -5.638004330  -5.435020984
#>   [220,]   0.7869066841   1.126819695   1.606594338
#>   [221,]   1.1550816274   1.475423043   2.259161246
#>   [222,]   1.2653496439   2.990290446   3.237351198
#>   [223,]   2.1133591367   3.791334772   4.739347802
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#>   [225,]  -1.9859220159  -3.346827883  -4.333753599
#>   [226,]   0.6261176633   0.633519867   1.132332958
#>   [227,]  -1.2451587088  -1.467792643  -2.367250977
#>   [228,]  -0.5009682382  -0.815295242  -1.077151900
#>   [229,]   0.5150929410   1.856972210   1.672852221
#>   [230,]  -0.7791195508  -0.418905362  -1.204021126
#>   [231,]  -1.0494455689  -3.160201654  -3.062416827
#>   [232,]  -0.6607660787  -1.021654438  -1.390937262
#>   [233,]   1.3968965966   2.149726672   2.934909863
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#> [1282,] -0.0365016807   0.542563497   0.255583174
#> [1283,]   0.6162331931 -0.086407274   0.720477804
#> [1284,] -0.6820378623 -0.449017449 -1.099673188
#> [1285,]   0.9531386147   0.755941705   1.608060409
#> [1286,]   1.5363840783   3.741656858   3.992302510
#> [1287,]   0.1061404513 -0.701003123 -0.256672406
#> [1288,] -2.0065829120 -2.701794682 -4.001550894
#> [1289,]   0.3688291047   0.398969904   0.681333964
#> [1290,] -0.4957272582 -1.934738464 -1.691860624
#> [1291,] -1.1383624360 -1.792261116 -2.414144621
#> [1292,]   1.0081060548   0.858193857   1.733349349
#> [1293,]   0.8003204266   2.105615647   2.166511775
#> [1294,]   0.8446111681   0.815954974   1.506033748
#> [1295,]   0.4847165505   0.887650985   1.097040785
#> [1296,]   0.5107515628   0.738850528   1.046927890
#> [1297,] -1.3806608400 -4.413163220 -4.170776724
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#> [1298,]   0.2737242686   0.346757827   0.533764656
#> [1299,]   1.7609092676   3.361182132   4.061133298
#> [1300,] -1.5675936691 -2.410628885 -3.292555436
#> [1301,]   0.0740052391   0.598055613   0.424178850
#> [1302,]   0.3200518635   2.043883668   1.533368009
#> [1303,]   0.8501741443   0.855917191   1.535148023
#> [1304,] -2.7142713317 -4.863115878 -6.083466694
#> [1305,] -0.1985151763 -0.385166257 -0.461295523
#> [1306,] -1.0656293145 -1.833766715 -2.346481771
#> [1307,] -2.6763271207 -5.353116792 -6.308081028
#> [1308,]   1.1321662363   2.146042112   2.602751726
#> [1309,]   0.3759906030   1.164519229   1.115112029
#> [1310,] -1.7159524238 -3.302593620 -3.972558860
#> [1311,]   0.9861248929   1.511851573   2.068691953
#> [1312,]   0.5980208405   0.563625297   1.058508233
#> [1313,] -1.5712836201 -1.353754130 -2.710635489
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#> [1318,]   0.3139042541 -0.363455177   0.189729796
#> [1319,]   0.7833027950   1.149375815   1.614618064
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#> [1323,] -1.4139561920 -1.476002971 -2.582294383
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#> [1326,] -1.3969368142 -1.888753133 -2.790130626
#> [1327,]   1.0540830404   2.628959726   2.773382631
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#> [1334,]   0.5247937221   0.116059264   0.718815100
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#> [1336,] -1.2882699287 -2.987708184 -3.264499278
#> [1337,]   0.8259395731   1.415595146   1.815525840
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#> [1340,] -0.8363953430 -0.897134236 -1.540839873
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#> [1342,] -0.6987213702 -1.079816665 -1.470544337
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#> [1399,]   1.6042457050   3.280343618   3.820915041
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#> [1402,]   1.3412349728   2.940060738   3.304103270
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#> [1451,]   1.0196863156   1.898685765   2.325219143
#> [1452,]   1.4565274035   1.020201492   2.382429079
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#> [1558,] -1.6923737192 -2.025533132 -3.234441593
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#> [1612,]  0.1915611728  0.282455261  0.395623720
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#> [1621,]  -0.6517662335  -1.338382315  -1.555485349
#> [1622,]   0.1909084780   0.583287305   0.561759011
#> [1623,]  -3.2002087064  -4.823580182  -6.667480032
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#> [1805,]  -0.1909669012 -0.110529759 -0.299471219
#> [1806,]   0.4064441721  2.154087081  1.702255736
#> [1807,]   0.0919865291  1.023988746  0.682976208
#> [1808,]  -0.8866197303 -2.107479780 -2.275159762
#> [1809,]  -0.2603332412 -0.933706179 -0.842798079
#> [1810,]   1.2988986588  1.339583093  2.363112666
#> [1811,]  -0.5513019299 -2.382073129 -2.009413116
#> [1812,]   0.5881084062  2.564607954  2.156609227
#> [1813,]   1.8434983317  3.154611346  4.049482039
#> [1814,]  -0.4455127019 -0.707222351 -0.948024047
#> [1815,]  -0.3835888130  0.040683107 -0.455750005
#> [1816,]   0.3330221225  2.072956178  1.565675683
#> [1817,]   0.6278281336  1.172601894  1.433633834
#> [1818,]   1.2119368911  2.648898678  2.981288446
#> [1819,]   0.3952712189  0.817971621  0.946835151
#> [1820,]   0.1126766900  1.364520216  0.897757124
#> [1821,]  -0.9838305329 -1.977766314 -2.324394107
#> [1822,]  -1.1685437175 -2.338843543 -2.755110426
#> [1823,]   0.4782960175  1.319710979  1.328809718
#> [1824,]   0.1324156434  0.117114437  0.230113216
#> [1825,]  -2.4292554021 -5.328461608 -5.986305040
#> [1826,]   1.1822177030  3.036628890  3.159403260
#> [1827,]  -1.1386621631 -1.365012884 -2.177413493
#> [1828,]  -0.4939233122 -1.709059966 -1.564369022
#> [1829,]  -0.1031697149  0.977389210  0.413759560
#> [1830,]   1.1049950224  1.480591761  2.199572693
#> [1831,]   1.3457569889  0.888320906  2.171112428
#> [1832,]  -0.2783414123  0.798238905  0.095903108
#> [1833,]   1.3939423537  2.661783127  3.215395876
#> [1834,]   2.4321000151  4.585864762  5.577742055
#> [1835,]   0.8461393236  1.854634768  2.084363125
#> [1836,]   0.3820202403 -0.204385111  0.362946269
#> [1837,]  -0.9730425874 -1.449475983 -2.017762744
```

```
#> [1838,]   0.2864778346   0.752189496   0.774665695
#> [1839,]  -1.7638918441  -3.725420968  -4.266989814
#> [1840,]  -1.8943887140  -2.881078875  -3.961142239
#> [1841,]   0.8337614123   1.423591108   1.829716938
#> [1842,]   1.2822612304   2.909328068   3.213508871
#> [1843,]   1.9880121615   4.247876753   4.836404366
#> [1844,]   0.3715255820   0.743394458   0.875837623
#> [1845,]   1.9562533769   3.207733690   4.219565957
#> [1846,]   0.0788949734   0.018537698   0.108668069
#> [1847,]   1.5003760798   2.951244631   3.508755577
#> [1848,]  -0.0668740213  -0.705711704  -0.475030990
#> [1849,]   0.2592183351   0.613271464   0.663579963
#> [1850,]  -1.1840582079  -1.338810277  -2.219480085
#> [1851,]   2.2532675092   4.392503458   5.247434140
#> [1852,]  -0.6877152893  -0.870546399  -1.340683742
#> [1853,]  -0.7577953230  -0.669946273  -1.316747444
#> [1854,]  -2.6136222318  -3.610474525  -5.262795813
#> [1855,]   2.2529019280   3.169760736   4.568407251
#> [1856,]   1.0252852117   2.064364200   2.424145447
#> [1857,]   0.7959076775   1.267181867   1.695713522
#> [1858,]  -0.9109583047  -1.996477362  -2.243907773
#> [1859,]   1.8108904418   2.114754341   3.431743565
#> [1860,]   0.8696211400   1.354926659   1.836327392
#> [1861,]   1.8262698011   2.709505152   3.780983111
#> [1862,]   1.2199553261   0.657210403   1.885983667
#> [1863,]  -0.1635554737   0.428860692   0.034049389
#> [1864,]   0.0683675721   0.584273510   0.409500304
#> [1865,]  -0.6032878883  -0.935427691  -1.271410896
#> [1866,]  -0.7665694694  -1.989457508  -2.059962116
#> [1867,]  -1.3460396443  -3.017664902  -3.353161659
#> [1868,]  -1.6716881716  -3.814378667  -4.201381514
#> [1869,]  -2.5340456108  -4.867433799  -5.861125161
#> [1870,]  -0.4065055583   0.904089975  -0.005172056
#> [1871,]  -0.5115511136   0.086959232  -0.589635072
#> [1872,]  -1.7198883503  -2.952373598  -3.783109431
#> [1873,]   0.7180282902   1.233898994   1.580128913
#> [1874,]  -0.9713296076  -0.332139194  -1.395551556
#> [1875,]  -0.3321403128   0.410825895  -0.186181025
#> [1876,]  -0.7067636801  -1.117851834  -1.501680860
#> [1877,]  -0.0960709796   0.313843837   0.054371637
#> [1878,]   0.4849010026   1.511764684   1.443627765
#> [1879,]   1.7499361078   3.809982316   4.296515304
#> [1880,]  -1.2249412384  -2.321304164  -2.815703363
#> [1881,]  -0.5200597095  -0.972793174  -1.188363333
#> [1882,]   0.6300539731   2.544532473   2.197773442
```

```
#> [1883,] -0.1958564802 -0.663202272 -0.612278530
#> [1884,] -0.9019061949 -0.847559308 -1.595018560
#> [1885,]  0.2990673083  1.169156215  1.021763583
#> [1886,]  0.3616247642  1.143735610  1.085664083
#> [1887,]  2.3629654606  3.882399955  5.101139161
#> [1888,] -0.0186623565 -0.868185428 -0.505078141
#> [1889,] -0.3586072728 -1.032337703 -1.020080158
#> [1890,] -0.7687322610 -0.823316769 -1.415499787
#> [1891,] -0.0333518894  1.646977931  0.872414671
#> [1892,]  1.2869856993  1.657700380  2.524799224
#> [1893,] -1.0964249056 -2.581788487 -2.800004010
#> [1894,]  0.1419065168  0.716900734  0.574804424
#> [1895,]  0.1042445844  0.262407471  0.275616031
#> [1896,] -1.6518998614 -2.335884051 -3.356203284
#> [1897,]  1.9491639944  3.089341516  4.145022942
#> [1898,] -0.2752761076  0.315434809 -0.168210579
#> [1899,] -1.0709404248 -1.674329066 -2.264623398
#> [1900,]  0.7689382594  1.025413049  1.527911636
#> [1901,] -2.0757159152 -2.702889486 -4.088365910
#> [1902,] -1.3997660453 -3.164921588 -3.501878681
#> [1903,] -0.5902942500 -0.288697928 -0.896300153
#> [1904,] -0.3332322534 -0.952085017 -0.943901146
#> [1905,]  0.7594262263  2.095329467  2.109809142
#> [1906,] -0.0840972401 -1.000391269 -0.660042813
#> [1907,] -1.8865895597 -2.912512498 -3.968861197
#> [1908,] -1.4739044008 -3.538177643 -3.801469181
#> [1909,]  1.6805336689  2.993084737  3.756627923
#> [1910,] -1.3025806208 -3.383156386 -3.501801615
#> [1911,] -1.2666113685 -2.256244668 -2.831559869
#> [1912,]  0.2727172533 -0.139741984  0.262521902
#> [1913,] -0.0449331299 -0.785699280 -0.492060901
#> [1914,] -1.4947663662 -2.919126652 -3.483936245
#> [1915,]  1.8278228705  3.789525347  4.382285747
#> [1916,]  1.1930028008  1.723613702  2.444183600
#> [1917,]  0.5518403028  0.743188500  1.100572104
#> [1918,] -0.8048536274  0.140370430 -0.925736346
#> [1919,]  1.2464039711  1.536770761  2.407083761
#> [1920,]  0.7994230270  0.917232304  1.505889735
#> [1921,] -2.2963226113 -3.514373998 -4.813797889
#> [1922,]  0.6081599034  0.499138961  1.035364221
#> [1923,]  0.8030443845  1.928747664  2.071754169
#> [1924,] -0.6645760987 -1.709707632 -1.777528994
#> [1925,]  0.9418929479  1.100109706  1.785036123
#> [1926,]  0.3583421805 -0.374973351  0.238750880
#> [1927,] -0.9344200300 -1.741616821 -2.131727137
```

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#> [1928,]   0.9516828523   1.574857770   2.060709233
#> [1929,]   0.9529574874   1.674113576   2.117381493
#> [1930,]  -0.5667280010  -0.735107288  -1.114652025
#> [1931,]  -1.0039644677  -2.254952789  -2.503327602
#> [1932,]   0.9665138791   2.909556675   2.819905231
#> [1933,]   0.3156515183  -0.146369684   0.312381959
#> [1934,]  -0.3104417279   0.655027171  -0.023601847
#> [1935,]   0.7761843008   1.820833496   1.978372347
#> [1936,]  -0.7094415606  -1.765028329  -1.864175981
#> [1937,]   1.8326845803   3.334559013   4.135860933
#> [1938,]  -0.2941573603  -0.898217086  -0.865281105
#> [1939,]   1.6224866913   2.868531847   3.615122887
#> [1940,]  -0.2732442802  -0.409769211  -0.568134800
#> [1941,]   0.5878249344   1.640482906   1.643405033
#> [1942,]   0.1452040298   0.391836310   0.398519210
#> [1943,]   1.5928417310   0.884509767   2.477107039
#> [1944,]  -3.3007566171  -4.751546352  -6.752885466
#> [1945,]   0.4307945942  -0.165525352   0.445332432
#> [1946,]  -0.3351252154  -0.009934065  -0.423407299
#> [1947,]  -0.4211733804  -1.220176571  -1.202341526
#> [1948,]  -1.9119110669  -2.564248366  -3.807164588
#> [1949,]   3.8359565021   6.445561368   8.360376216
#> [1950,]   1.0492273868   2.529157913   2.711941902
#> [1951,]   0.5244798304   0.331468556   0.837966822
#> [1952,]  -0.6800618441  -2.446245909  -2.205587309
#> [1953,]  -1.1900558523  -0.204314729  -1.597361495
#> [1954,]  -0.9509212043  -2.372986648  -2.502687584
#> [1955,]  -0.3487885754  -0.114123810  -0.498266176
#> [1956,]  -1.0771461431  -3.894488993  -3.504457607
#> [1957,]  -1.2433257891  -2.479035671  -2.926162905
#> [1958,]   0.8996821523   0.762604790   1.545099023
#> [1959,]   1.2502700364   1.922493411   2.625964587
#> [1960,]  -0.6244526681  -1.522494057  -1.623600198
#> [1961,]   0.6724898624   1.317748900   1.569876610
#> [1962,]  -0.3068236261  -0.250386545  -0.521556853
#> [1963,]   0.6643797484   0.676552309   1.203926201
#> [1964,]  -1.4839359994  -3.544230375  -3.817337393
#> [1965,]   2.5885696380   3.365818377   5.095781821
#> [1966,]  -0.2599268358  -2.530707287  -1.728560051
#> [1967,]   0.1953899592   1.565591189   1.112484856
#> [1968,]  -0.9851479674  -2.350914849  -2.533118736
#> [1969,]   0.8338655289   1.131525302   1.667762475
#> [1970,]  -0.3645373457   0.447464466  -0.206246590
#> [1971,]  -0.8171996434  -3.288630127  -2.844083320
#> [1972,]  -0.6009049400   0.121834347  -0.681703243
```

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#> [1973,]  -0.4187052022 -1.348984104 -1.270746546
#> [1974,]  -0.2814198011 -0.809665291 -0.800255090
#> [1975,]  -1.4086053715 -1.579159552 -2.632869603
#> [1976,]   0.5005903615  1.254085235  1.320190770
#> [1977,]  -1.3568409194 -2.081880544 -2.847309490
#> [1978,]   0.2213222885  1.253829008  0.971806984
#> [1979,]   1.7853307578  2.160434990  3.425222008
#> [1980,]  -0.2490981423 -1.368861843 -1.070281314
#> [1981,]  -3.0577878945 -6.350404893 -7.337207974
#> [1982,]  -1.2543325273 -2.425835534 -2.910364234
#> [1983,]   0.3625843622  0.438219914  0.695329009
#> [1984,]   0.7696267707  1.253431218  1.655310733
#> [1985,]  -0.3139857948  0.120900407 -0.324439218
#> [1986,]  -0.6400097629 -0.530305073 -1.092376233
#> [1987,]  -0.7553922481 -0.255811989 -1.083923670
#> [1988,]  -1.3791333634 -2.550609916 -3.135232890
#> [1989,]  -1.6192516522 -3.701165568 -4.073165714
#> [1990,]  -0.9785075023 -1.090325145 -1.825263703
#> [1991,]  -1.0641980880 -1.592628534 -2.210875466
#> [1992,]   1.0433163944  1.335057884  2.041895493
#> [1993,]  -1.5493470091 -1.644157804 -2.844442863
#> [1994,]  -0.7145459358 -1.132466421 -1.519495657
#> [1995,]  -0.5122162506 -0.630550455 -0.988652320
#> [1996,]   0.3573166209  1.714188622  1.396869454
#> [1997,]   1.0160310867  0.915715035  1.775153547
#> [1998,]  -0.6622144691 -0.844874244 -1.294637769
#> [1999,]  -0.5461691557 -1.781839398 -1.669908061
#> [2000,]   0.3162502839  2.444504805  1.750955474
#>
#> [[1]][[19]]$value[[1]]$decomposition
#> [1] "eigen"
#>
#>
#>
#> [[1]][[19]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[20]]
#> [[1]][[20]]$value
#> [[1]][[20]]$value[[1]]
#> [[1]][[20]]$value[[1]]$M
#> [1] 2
#>
#> [[1]][[20]]$value[[1]]$est
```

```
#> [1] 0 0 0
#>
#> [[1]][[20]]$value[[1]]$within
#>      [,1] [,2] [,3]
#> [1,]    1    0    0
#> [2,]    0    1    0
#> [3,]    0    0    1
#>
#> [[1]][[20]]$value[[1]]$between
#>      [,1] [,2] [,3]
#> [1,]    0    0    0
#> [2,]    0    0    0
#> [3,]    0    0    0
#>
#> [[1]][[20]]$value[[1]]$total
#>      [,1] [,2] [,3]
#> [1,]    1    0    0
#> [2,]    0    1    0
#> [3,]    0    0    1
#>
#> [[1]][[20]]$value[[1]]$ariv
#> [1] NA
#>
#> [[1]][[20]]$value[[1]]$total_adj
#> [1] NA
#>
#>
#>
#> [[1]][[20]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[21]]
#> [[1]][[21]]$value
#> [[1]][[21]]$value[[1]]
#>              est se R 0.05% 0.5% 2.5% 97.5% 99.5% 99.95%
#> eta1=~y1   1.0000 NA 0    NA   NA   NA    NA    NA     NA
#> eta1=~y2   0.7039 NA 0    NA   NA   NA    NA    NA     NA
#> eta1=~y3   0.7047 NA 0    NA   NA   NA    NA    NA     NA
#> eta1=~y4   0.8566 NA 0    NA   NA   NA    NA    NA     NA
#> y1~~y1     0.0000 NA 0    NA   NA   NA    NA    NA     NA
#> y2~~y2     0.5045 NA 0    NA   NA   NA    NA    NA     NA
#> y3~~y3     0.5034 NA 0    NA   NA   NA    NA    NA     NA
#> y4~~y4     0.2662 NA 0    NA   NA   NA    NA    NA     NA
#> eta1~~eta1 1.0000 NA 0    NA   NA   NA    NA    NA     NA
```

```
#> 
#> 
#> [[1]][[21]]$visible
#> [1] TRUE
```

Environment

```r
ls()

#> [1] "i"        "root"      "tex_file"
```

Class

```
#> [[1]]
#> [1] "character"
#>
#> [[2]]
#> [1] "root_criterion"
#>
#> [[3]]
#> [1] "character"
```

References

R Core Team. (2023). *R: A language and environment for statistical computing.* R Foundation for Statistical Computing. Vienna, Austria. https://www.R-project.org/