semmcci: Internal Tests

Ivan Jacob Agaloos Pesigan

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
```

```
#> 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 0.0914 100 0.3255  0.3372  0.3832  0.7133  0.7811  0.8267
#> visual=~x3        0.7294 0.1002 100 0.4712  0.5059  0.5489  0.9414  0.9699  0.9868
#> textual=~x4       1.0000 0.0000 100 1.0000  1.0000  1.0000  1.0000  1.0000  1.0000
#> textual=~x5       1.1131 0.0590 100 0.9180  0.9479  1.0126  1.2311  1.2413  1.2484
#> textual=~x6       0.9261 0.0537 100 0.7908  0.7927  0.8303  1.0188  1.0469  1.0677
#> speed=~x7         1.0000 0.0000 100 1.0000  1.0000  1.0000  1.0000  1.0000  1.0000
#> speed=~x8         1.1800 0.1690 100 0.7396  0.7749  0.8207  1.4392  1.4891  1.5169
#> speed=~x9         1.0815 0.1361 100 0.7655  0.7799  0.8244  1.3321  1.3466  1.3561
#> x1~~x1            0.5491 0.1183 100 0.2054  0.2093  0.3392  0.7598  0.8087  0.8220
#> x2~~x2            1.1338 0.0832 100 0.8368  0.8827  0.9601  1.2924  1.3427  1.3586
#> x3~~x3            0.8443 0.0915 100 0.6366  0.6372  0.6645  1.0222  1.0468  1.0585
#> x4~~x4            0.3712 0.0424 100 0.2589  0.2671  0.2823  0.4520  0.4550  0.4573
#> x5~~x5            0.4463 0.0668 100 0.2786  0.2858  0.3030  0.5687  0.6124  0.6350
#> x6~~x6            0.3562 0.0447 100 0.2406  0.2432  0.2621  0.4504  0.4748  0.4793
#> x7~~x7            0.7994 0.0920 100 0.5332  0.5570  0.6185  0.9617  1.0039  1.0209
#> x8~~x8            0.4877 0.0785 100 0.3190  0.3244  0.3518  0.6350  0.6700  0.6782
#> x9~~x9            0.5661 0.0687 100 0.3752  0.4008  0.4537  0.6989  0.7148  0.7204
#> visual~~visual    0.8093 0.1440 100 0.5209  0.5219  0.5443  1.1015  1.1691  1.1744
#> textual~~textual  0.9795 0.1042 100 0.7478  0.7565  0.8023  1.1894  1.2015  1.2081
#> speed~~speed      0.3837 0.0814 100 0.1944  0.2063  0.2416  0.5475  0.5608  0.5676
#> visual~~textual   0.4082 0.0697 100 0.2102  0.2297  0.2576  0.5331  0.5513  0.5526
#> visual~~speed     0.2622 0.0512 100 0.1616  0.1628  0.1768  0.3697  0.3852  0.3959
#> textual~~speed    0.1735 0.0444 100 0.0693  0.0758  0.1033  0.2473  0.2848  0.2875
#> 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 0.0916 100 0.3407  0.3479  0.3883  0.7179  0.7446  0.7501
#> visual=~x3        0.7294 0.1077 100 0.4672  0.4870  0.5313  0.9536  0.9592  0.9604
#> textual=~x4       1.0000 0.0000 100 1.0000  1.0000  1.0000  1.0000  1.0000  1.0000
#> textual=~x5       1.1131 0.0633 100 0.9339  0.9387  0.9842  1.2318  1.2465  1.2472
#> textual=~x6       0.9261 0.0540 100 0.7762  0.7773  0.8019  1.0072  1.0480  1.0538
#> speed=~x7         1.0000 0.0000 100 1.0000  1.0000  1.0000  1.0000  1.0000  1.0000
#> speed=~x8         1.1800 0.1526 100 0.7950  0.8189  0.8761  1.4597  1.5887  1.6689
#> speed=~x9         1.0815 0.1630 100 0.7260  0.7412  0.7866  1.3414  1.4092  1.4266
#> x1~~x1            0.5491 0.1118 100 0.2851  0.2933  0.3551  0.7491  0.8339  0.8490
#> x2~~x2            1.1338 0.0983 100 0.8787  0.8902  0.9496  1.3419  1.3635  1.3760
#> x3~~x3            0.8443 0.0948 100 0.5964  0.6245  0.6600  1.0453  1.0817  1.0981
#> x4~~x4            0.3712 0.0486 100 0.2526  0.2537  0.2723  0.4647  0.5047  0.5066
#> x5~~x5            0.4463 0.0546 100 0.3035  0.3155  0.3514  0.5491  0.5823  0.5852
#> x6~~x6            0.3562 0.0414 100 0.2375  0.2481  0.2823  0.4402  0.4457  0.4468
#> x7~~x7            0.7994 0.0764 100 0.5802  0.6034  0.6485  0.9262  0.9846  0.9858
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#> x8~~x8          0.4877 0.0760 100 0.2979 0.3170 0.3561 0.6378 0.6820 0.6897
#> x9~~x9          0.5661 0.0801 100 0.3905 0.4014 0.4554 0.7342 0.7786 0.7802
#> visual~~visual  0.8093 0.1418 100 0.5021 0.5179 0.5504 1.1204 1.1728 1.1942
#> textual~~textual 0.9795 0.1041 100 0.7011 0.7411 0.8000 1.1576 1.2617 1.3120
#> speed~~speed    0.3837 0.0851 100 0.1740 0.1766 0.1967 0.5370 0.5862 0.5971
#> visual~~textual 0.4082 0.0632 100 0.2431 0.2463 0.2775 0.5153 0.5503 0.5525
#> visual~~speed   0.2622 0.0596 100 0.0980 0.1079 0.1309 0.3623 0.3785 0.3816
#> textual~~speed  0.1735 0.0475 100 0.0522 0.0664 0.0874 0.2579 0.2931 0.3178
#> Standardized Monte Carlo Confidence Intervals
#>                  est     se   R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> visual=~x1      0.7719 0.0555 100 0.6422 0.6500 0.6645 0.8692 0.9178 0.9189
#> visual=~x2      0.4236 0.0552 100 0.2849 0.2913 0.3076 0.5164 0.5310 0.5383
#> visual=~x3      0.5811 0.0514 100 0.4487 0.4501 0.4694 0.6728 0.6869 0.6945
#> textual=~x4     0.8516 0.0202 100 0.7995 0.8045 0.8119 0.8874 0.8997 0.8999
#> textual=~x5     0.8551 0.0252 100 0.7974 0.7974 0.8086 0.8981 0.9058 0.9064
#> textual=~x6     0.8380 0.0234 100 0.7813 0.7851 0.7935 0.8843 0.8938 0.8992
#> speed=~x7       0.5695 0.0538 100 0.4307 0.4365 0.4774 0.6786 0.6825 0.6836
#> speed=~x8       0.7230 0.0583 100 0.5699 0.5711 0.5765 0.7993 0.8067 0.8098
#> speed=~x9       0.6650 0.0524 100 0.5213 0.5363 0.5632 0.7486 0.7642 0.7666
#> x1~~x1          0.4042 0.0861 100 0.1555 0.1577 0.2445 0.5584 0.5774 0.5876
#> x2~~x2          0.8206 0.0456 100 0.7103 0.7180 0.7334 0.9054 0.9151 0.9188
#> x3~~x3          0.6623 0.0584 100 0.5177 0.5281 0.5473 0.7796 0.7974 0.7987
#> x4~~x4          0.2748 0.0344 100 0.1902 0.1906 0.2126 0.3409 0.3528 0.3607
#> x5~~x5          0.2689 0.0430 100 0.1784 0.1795 0.1934 0.3462 0.3641 0.3641
#> x6~~x6          0.2977 0.0391 100 0.1914 0.2012 0.2179 0.3703 0.3836 0.3896
#> x7~~x7          0.6757 0.0613 100 0.5326 0.5342 0.5395 0.7721 0.8094 0.8145
#> x8~~x8          0.4772 0.0809 100 0.3443 0.3492 0.3611 0.6676 0.6739 0.6752
#> x9~~x9          0.5578 0.0689 100 0.4123 0.4160 0.4396 0.6828 0.7121 0.7282
#> 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 0.0635 100 0.2575 0.2805 0.3162 0.5633 0.5825 0.5916
#> visual~~speed   0.4705 0.0687 100 0.3124 0.3182 0.3390 0.6011 0.6165 0.6170
#> textual~~speed  0.2830 0.0660 100 0.1210 0.1283 0.1633 0.4114 0.4268 0.4329
#> Standardized Monte Carlo Confidence Intervals
#>                  est     se   R  0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> visual=~x1      0.7719 0.0527 100 0.6179 0.6320 0.6565 0.8612 0.8943 0.8985
#> visual=~x2      0.4236 0.0510 100 0.2794 0.2882 0.3209 0.5144 0.5291 0.5358
#> visual=~x3      0.5811 0.0534 100 0.4405 0.4560 0.4827 0.6842 0.6903 0.6935
#> textual=~x4     0.8516 0.0228 100 0.7902 0.7932 0.8066 0.8981 0.9035 0.9037
#> textual=~x5     0.8551 0.0208 100 0.7978 0.8005 0.8086 0.8898 0.8986 0.9002
#> textual=~x6     0.8380 0.0219 100 0.7630 0.7682 0.7913 0.8716 0.8794 0.8812
#> speed=~x7       0.5695 0.0530 100 0.4077 0.4128 0.4568 0.6579 0.6685 0.6744
#> speed=~x8       0.7230 0.0508 100 0.5737 0.5907 0.6204 0.8017 0.8165 0.8256
#> speed=~x9       0.6650 0.0582 100 0.4859 0.4886 0.5153 0.7374 0.7634 0.7775
#> x1~~x1          0.4042 0.0806 100 0.1927 0.2001 0.2584 0.5689 0.6003 0.6181
```

```
#> x2~~x2          0.8206 0.0423 100 0.7129 0.7200 0.7353 0.8970 0.9168 0.9219
#> x3~~x3          0.6623 0.0620 100 0.5191 0.5235 0.5318 0.7670 0.7917 0.8059
#> x4~~x4          0.2748 0.0387 100 0.1833 0.1836 0.1934 0.3494 0.3707 0.3757
#> x5~~x5          0.2689 0.0355 100 0.1897 0.1925 0.2082 0.3462 0.3591 0.3635
#> x6~~x6          0.2977 0.0364 100 0.2236 0.2266 0.2403 0.3738 0.4099 0.4178
#> x7~~x7          0.6757 0.0592 100 0.5452 0.5530 0.5672 0.7912 0.8295 0.8338
#> x8~~x8          0.4772 0.0723 100 0.3184 0.3332 0.3573 0.6150 0.6507 0.6708
#> x9~~x9          0.5578 0.0740 100 0.3954 0.4170 0.4563 0.7344 0.7613 0.7639
#> 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 0.0596 100 0.3102 0.3122 0.3414 0.5662 0.6219 0.6605
#> visual~~speed    0.4705 0.0759 100 0.2619 0.2679 0.3139 0.5938 0.6226 0.6337
#> textual~~speed   0.2830 0.0708 100 0.1096 0.1312 0.1568 0.4119 0.4548 0.4714
#> 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]]
#> [[1]][[1]]
#> [[1]][[1]]$value
#> [[1]][[1]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[1]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[2]]
#> [[1]][[2]]$value
#> [[1]][[2]]$value[[1]]
#> [1] TRUE
#>
```

```
#>
#> [[1]][[2]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[3]]
#> [[1]][[3]]$value
#> [[1]][[3]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[3]]$visible
#> [1] TRUE
#>
#>
#> [[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  0.4226 20000   3.7952    4.1130    4.3927
#> alien67=~anomia67           1.0000  0.0000 20000   1.0000    1.0000    1.0000
#> alien67=~powerless67        0.9787  0.0617 20000   0.7819    0.8206    0.8586
#> alien71=~anomia71           1.0000  0.0000 20000   1.0000    1.0000    1.0000
#> alien71=~powerless71        0.9221  0.0596 20000   0.7238    0.7704    0.8044
#> alien71~alien67             0.6070  0.0517 20000   0.4442    0.4735    0.5051
#> alien71~ses                -0.2268  0.0523 20000  -0.3936   -0.3613   -0.3295
#> alien67~ses                -0.5750  0.0569 20000  -0.7511   -0.7201   -0.6866
#> anomia67~~anomia71          1.6229  0.3111 20000   0.5932    0.8201    1.0253
#> powerless67~~powerless71    0.3387  0.2605 20000  -0.5417   -0.3457   -0.1729
#> education~~education        2.8013  0.5111 20000   1.1091    1.4788    1.7987
#> sei~~sei                  264.5971 18.1580 20000 205.5058  217.3194  228.8914
#> anomia67~~anomia67          4.7307  0.4496 20000   3.2807    3.5823    3.8599
#> powerless67~~powerless67    2.5634  0.4043 20000   1.2227    1.5294    1.7712
#> anomia71~~anomia71          4.3992  0.5137 20000   2.7117    3.0571    3.3917
```

```
#> powerless71~~powerless71    3.0699   0.4317 20000       1.6491    1.9612    2.2285
#> ses~~ses                    6.7983   0.6529 20000       4.6536    5.1373    5.5118
#> alien67~~alien67            4.8415   0.4671 20000       3.3544    3.6772    3.9384
#> alien71~~alien71            4.0832   0.4059 20000       2.7464    3.0179    3.2884
#>                              97.5%     99.5%    99.95%
#> ses=~education              1.0000    1.0000   1.0000
#> ses=~sei                    6.0529    6.3075   6.5912
#> alien67=~anomia67           1.0000    1.0000   1.0000
#> alien67=~powerless67        1.0996    1.1371   1.1820
#> alien71=~anomia71           1.0000    1.0000   1.0000
#> alien71=~powerless71        1.0386    1.0743   1.1218
#> alien71~alien67             0.7077    0.7417   0.7744
#> alien71~ses                -0.1235   -0.0939  -0.0633
#> alien67~ses                -0.4633   -0.4285  -0.3856
#> anomia67~~anomia71          2.2392    2.4202   2.6258
#> powerless67~~powerless71    0.8488    0.9970   1.1850
#> education~~education        3.8060    4.1545   4.4917
#> sei~~sei                  299.9128  311.4473 326.7548
#> anomia67~~anomia67          5.6198    5.9100   6.1099
#> powerless67~~powerless67    3.3423    3.6068   3.8783
#> anomia71~~anomia71          5.4021    5.7209   6.0642
#> powerless71~~powerless71    3.9179    4.1716   4.4938
#> ses~~ses                    8.0565    8.4850   8.9355
#> alien67~~alien67            5.7619    6.0344   6.3547
#> alien71~~alien71            4.8719    5.0980   5.4687
#>
#>
#> [[1]][[5]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[6]]
#> [[1]][[6]]$value
#> [[1]][[6]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[6]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[7]]
#> [[1]][[7]]$value
#> [[1]][[7]]$value[[1]]
#> [1] TRUE
#>
```

```
#> 
#> [[1]][[7]]$visible
#> [1] TRUE
#> 
#> 
#> [[1]][[8]]
#> [[1]][[8]]$value
#> [[1]][[8]]$value[[1]]
#> [1] TRUE
#> 
#> 
#> [[1]][[8]]$visible
#> [1] TRUE
#> 
#> 
#> [[1]][[9]]
#> [[1]][[9]]$value
#> [[1]][[9]]$value[[1]]
#> [1] TRUE
#> 
#> 
#> [[1]][[9]]$visible
#> [1] TRUE
#> 
#> 
#> [[1]][[10]]
#> [[1]][[10]]$value
#> [[1]][[10]]$value[[1]]
#> [1] TRUE
#> 
#> 
#> [[1]][[10]]$visible
#> [1] TRUE
#> 
#> 
#> [[1]][[11]]
#> [[1]][[11]]$value
#> [[1]][[11]]$value[[1]]
#> [1] TRUE
#> 
#> 
#> [[1]][[11]]$visible
#> [1] TRUE
#> 
#> 
#> [[1]][[12]]
```

```
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#>
#>
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#>
#> [[1]][[13]]$visible
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#> [[1]][[15]]$visible
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#> [[1]][[16]]
#> [[1]][[16]]$value
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#> [1] TRUE
#>
#>
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#> [[1]][[16]]$visible
#> [1] TRUE
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#>
#> [[1]][[17]]
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#>
#> [[1]][[17]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[18]]
#> [[1]][[18]]$value
#> [[1]][[18]]$value[[1]]
#>                        2.5 %      97.5 %
#> visual=~x1        0.6565442 0.8611680
#> visual=~x2        0.3208704 0.5144389
#> visual=~x3        0.4826641 0.6842187
#> textual=~x4       0.8065995 0.8981141
#> textual=~x5       0.8085863 0.8898196
#> textual=~x6       0.7913139 0.8715864
#> speed=~x7         0.4568392 0.6579101
#> speed=~x8         0.6204336 0.8016899
#> speed=~x9         0.5152871 0.7373715
#> x1~~x1            0.2583858 0.5689432
#> x2~~x2            0.7353385 0.8970398
#> x3~~x3            0.5318406 0.7670231
#> x4~~x4            0.1933911 0.3493936
#> x5~~x5            0.2082195 0.3461841
#> x6~~x6            0.2403372 0.3738217
#> x7~~x7            0.5671541 0.7911623
#> x8~~x8            0.3572711 0.6149960
#> x9~~x9            0.4562589 0.7343611
#> visual~~visual    1.0000000 1.0000000
#> textual~~textual  1.0000000 1.0000000
#> speed~~speed      1.0000000 1.0000000
#> visual~~textual   0.3414077 0.5662050
#> visual~~speed     0.3139351 0.5938117
#> textual~~speed    0.1568157 0.4119323
#>
#>
#> [[1]][[18]]$visible
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#> [1] TRUE
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#>
#> [[1]][[19]]
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#> [[1]][[19]]$value[[1]]
#> [[1]][[19]]$value[[1]]$thetahatstar
#>                    y1             y2             y3
#>    [1,]   1.6380523269   1.4374493607   2.840342054
#>    [2,]  -0.9518256556  -1.9048782384  -2.244034848
#>    [3,]  -0.1120480166   1.2182715985   0.536368139
#>    [4,]  -0.1203825620   0.2517243042  -0.010418150
#>    [5,]   0.4728180576   1.0099117345   1.150053204
#>    [6,]  -1.4783569426  -3.0346905539  -3.527607156
#>    [7,]   1.2407122016   2.5281738523   2.950173448
#>    [8,]  -1.4473011063  -1.3447878330  -2.551055904
#>    [9,]  -0.6315607152  -1.8679001317  -1.824149698
#>   [10,]  -2.3231615517  -3.7879251337  -4.999074928
#>   [11,]  -0.2007613816   0.3240258254  -0.070524581
#>   [12,]  -0.2486640554  -0.0710790067  -0.349524878
#>   [13,]   0.5857032895   0.6102288293   1.069011507
#>   [14,]  -1.1677894601  -1.2300297037  -2.138824625
#>   [15,]  -0.4116737290   0.5174728639  -0.226172970
#>   [16,]   1.9597254420   4.9267994016   5.177905048
#>   [17,]   0.3711714432   1.1477413423   1.099791611
#>   [18,]   2.4742654308   4.1746388311   5.402108294
#>   [19,]  -0.6563596262   0.0079668612  -0.814045792
#>   [20,]   2.6364298836   4.7745872753   5.937270327
#>   [21,]   0.5558080827   0.4837741618   0.961555748
#>   [22,]  -0.2799635261   0.1031823892  -0.291846901
#>   [23,]   1.2972380605   2.0652216874   2.763740973
#>   [24,]  -1.1524965946  -1.6282155314  -2.340731197
#>   [25,]  -0.2619358159   1.2550394446   0.369865726
#>   [26,]  -2.0958201543  -4.2073402224  -4.948342656
#>   [27,]  -0.3346359722  -0.0908776845  -0.467717542
#>   [28,]  -0.8776261978  -1.8665869096  -2.130259553
#>   [29,]   0.4976245942   0.8441953889   1.089020815
#>   [30,]   0.5389410556   0.2098002462   0.788478857
#>   [31,]  -0.8402041280  -2.0332984951  -2.176112945
#>   [32,]  -0.8788834572  -2.5251764568  -2.497316955
#>   [33,]  -1.1320748390  -2.5004699526  -2.799330368
#>   [34,]  -1.3656496222  -0.8849929995  -2.194071287
#>   [35,]   0.7869406277   1.5400460943   1.835960016
#>   [36,]   0.2792412500   1.3019603978   1.070741654
#>   [37,]   0.1908047819  -0.2116366750   0.120480177
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#>    [38,]   0.6716806237   2.2648705943   2.094480392
#>    [39,]   1.0743503654   0.4253706416   1.575755890
#>    [40,]   0.9465956930   1.5992260417   2.067889019
#>    [41,]  -0.0787223501   0.2662027332   0.049566207
#>    [42,]  -1.1480013547  -2.0749125772  -2.583023882
#>    [43,]   1.9177369791   4.3261676169   4.792220798
#>    [44,]   2.6776185827   4.6292136860   5.907955539
#>    [45,]   0.7175253523   0.1115163055   0.956626360
#>    [46,]  -0.9672698948  -1.2897279479  -1.921910843
#>    [47,]   0.5225663998   0.5524037680   0.958190605
#>    [48,]   0.2750568007   1.3339272863   1.083264016
#>    [49,]   0.3716342947   1.2583537533   1.161754034
#>    [50,]  -0.6759420380   0.1018521756  -0.786362242
#>    [51,]  -0.0185735936   0.3790517736   0.187196972
#>    [52,]  -1.5456456529  -3.1063852299  -3.651302348
#>    [53,]  -0.4663986680  -0.6608823689  -0.948351671
#>    [54,]  -0.9722707713  -0.4328724655  -1.452627916
#>    [55,]   0.0477041125   0.2070565635   0.174393779
#>    [56,]   0.5523100203   0.8604463009   1.166231002
#>    [57,]   0.4568377331  -0.1400678013   0.491935570
#>    [58,]  -0.3783403639  -0.5157616004  -0.758008811
#>    [59,]   0.4281170196   1.3397996178   1.277385885
#>    [60,]  -0.1008055738   0.0948732047  -0.073051838
#>    [61,]   0.0151548040  -1.3702359471  -0.741525850
#>    [62,]  -0.9826951130  -1.8616551164  -2.258541409
#>    [63,]  -0.4077616571  -0.9545494031  -1.038205423
#>    [64,]  -1.2622303848  -2.8943928874  -3.180242415
#>    [65,]  -0.2541303664  -1.1618980892  -0.961700177
#>    [66,]  -0.5334701563  -0.5700574147  -0.981584402
#>    [67,]  -1.6468339758  -3.4243290124  -3.953927611
#>    [68,]   1.8230637414   2.4585520292   3.637716744
#>    [69,]   2.4961929199   4.6724215751   5.705700008
#>    [70,]  -0.1935720468  -0.5457299953  -0.544237693
#>    [71,]  -0.6368684018  -1.6466461108  -1.707981557
#>    [72,]   0.8943842343   1.4300778235   1.908912216
#>    [73,]  -1.7169392509  -2.6696291982  -3.622520660
#>    [74,]  -0.7033224045  -1.4326127551  -1.672068792
#>    [75,]   0.2416967825  -0.0720633381   0.261398823
#>    [76,]  -1.3017992820  -2.3253314843  -2.913778770
#>    [77,]   0.0318868103   0.9314331076   0.556668580
#>    [78,]   1.0108892203   1.5249535199   2.106843596
#>    [79,]  -1.2577449354  -2.8507091802  -3.150406523
#>    [80,]  -0.8025117416  -0.5110447899  -1.284324235
#>    [81,]  -0.5615627719  -0.4554471283  -0.953011410
#>    [82,]  -0.0642760502   1.2952017088   0.638631797
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#>    [83,]   0.9783700405   1.8863733437   2.266865713
#>    [84,]   1.3201887283   0.1956985354   1.754852911
#>    [85,]  -0.1317251135   1.0862390484   0.438558663
#>    [86,]   0.1938149761   0.4701130934   0.502576406
#>    [87,]  -0.7933750017  -1.9338472306  -2.062526692
#>    [88,]  -1.3131400322  -2.6927468490  -3.131820598
#>    [89,]   0.9787152459   2.5658672618   2.644386852
#>    [90,]   0.9987321470   0.2563860271   1.387682128
#>    [91,]   1.3066038119   1.3463705256   2.376487576
#>    [92,]   0.0065326986   0.3945925337   0.227128477
#>    [93,]   0.8658668391   1.0797861169   1.678954374
#>    [94,]  -0.1440528973  -1.0451046132  -0.759620329
#>    [95,]  -1.5911021606  -2.3981597610  -3.314950203
#>    [96,]   0.7415507806   0.5439180168   1.226550425
#>    [97,]  -0.9892342185  -0.7844737569  -1.668904985
#>    [98,]   1.6632665068   3.2702251722   3.888897463
#>    [99,]  -0.2474771046  -0.6724381114  -0.681773900
#>   [100,]  -0.4812102296  -0.7846599130  -1.035512741
#>   [101,]  -0.9447239790  -1.9080109827  -2.236917744
#>   [102,]  -2.5661421085  -4.3733625174  -5.626959963
#>   [103,]  -2.9215176762  -4.9149750054  -6.370678302
#>   [104,]  -0.2643011591  -0.5566040337  -0.638470089
#>   [105,]   0.5135343599   0.3975129356   0.860969909
#>   [106,]   0.6133703951   1.3795554049   1.530455863
#>   [107,]   1.6544219679   2.8212431967   3.628702305
#>   [108,]  -0.2971611441  -1.0586084023  -0.958037227
#>   [109,]  -0.6762382992   0.5415496336  -0.542717993
#>   [110,]  -1.3932658123  -3.0595164112  -3.435277563
#>   [111,]  -0.9521564483  -0.9739738817  -1.727834397
#>   [112,]  -0.8119325887  -2.9278123397  -2.637276645
#>   [113,]   0.4309287315  -0.1985437318   0.427175880
#>   [114,]   0.5508618569   1.8102191600   1.691509344
#>   [115,]   0.7989082202   0.8450808746   1.465206759
#>   [116,]   0.4351110506   1.0409459392   1.120256019
#>   [117,]  -1.2331107118  -1.8029552232  -2.538228570
#>   [118,]  -0.2234995320   0.8031718483   0.167027391
#>   [119,]   0.7942398911   0.4656709694   1.248828836
#>   [120,]   2.7062536671   4.9086309291   6.098727777
#>   [121,]  -0.6604558700  -0.0436639253  -0.847806649
#>   [122,]  -0.6821366004  -1.1580544464  -1.493282160
#>   [123,]   0.8235566083   1.7714520204   2.010039997
#>   [124,]  -1.7643227604  -3.7958020150  -4.306585693
#>   [125,]  -1.2929495209  -3.7187531072  -3.676033959
#>   [126,]  -1.8651892205  -3.6012055713  -4.324371232
#>   [127,]   1.5081814373   1.5769039213   2.755787146
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#>  [128,]   1.8852601391   2.7804215690   3.893898501
#>  [129,]  -2.2605715837  -4.3076367007  -5.209444675
#>  [130,]   0.0285493494   0.0257561585   0.049894046
#>  [131,]  -1.4096697078  -3.3776632646  -3.632291070
#>  [132,]  -2.1905467034  -3.0412330314  -4.419324063
#>  [133,]  -0.2433105257  -0.7499693640  -0.719604860
#>  [134,]  -2.0445040881  -3.2042131578  -4.327659046
#>  [135,]  -1.0194780315  -1.4552327337  -2.078861551
#>  [136,]  -0.2964650569  -0.2906918382  -0.531007679
#>  [137,]  -0.7142909712  -1.2254858652  -1.570799619
#>  [138,]  -1.2890566846  -1.7932138826  -2.602586020
#>  [139,]  -1.8753976623  -4.0058350515  -4.561653371
#>  [140,]   1.6601958767   2.9155681684   3.688248661
#>  [141,]   0.6833924802   0.4806939011   1.118941474
#>  [142,]  -0.6706027727  -1.9488131906  -1.917737708
#>  [143,]   1.6784084253   3.1880371355   3.862168207
#>  [144,]   0.2174193238   1.1917716541   0.932500833
#>  [145,]   0.6473950169   0.9990701806   1.361730503
#>  [146,]  -1.2437846474  -0.7785648862  -1.983045002
#>  [147,]  -1.1754408573  -3.3051248597  -3.299956693
#>  [148,]  -0.4008192062  -0.8268411549  -0.958675598
#>  [149,]   0.8464815485   0.3476963240   1.248502128
#>  [150,]   0.3862573709   1.1379406300   1.113164470
#>  [151,]  -0.8371917364  -1.5333703233  -1.894917350
#>  [152,]   0.6735309040  -0.4592320020   0.585024766
#>  [153,]   0.1090458641   0.7086614231   0.529255388
#>  [154,]   1.0328377929   1.4933577482   2.116678688
#>  [155,]  -0.4327736164  -0.9674795462  -1.076570515
#>  [156,]  -1.5888062385  -1.9030894505  -3.037343940
#>  [157,]  -0.8204972073  -0.5556859053  -1.331525694
#>  [158,]  -0.4837976249  -0.4237035106  -0.838423479
#>  [159,]  -1.6386498805  -2.7775045809  -3.584761733
#>  [160,]   0.1046899532  -1.1211422203  -0.491640756
#>  [161,]  -0.6998759550  -1.0961404810  -1.481043115
#>  [162,]  -0.9122605392  -1.5688424541  -2.008212164
#>  [163,]  -0.1374813477   0.5315443842   0.123548442
#>  [164,]  -2.2808248729  -4.5578624829  -5.373564946
#>  [165,]   2.5760901680   4.2932303309   5.594894982
#>  [166,]  -0.1423208663  -1.1342657024  -0.806941193
#>  [167,]  -0.3638352149   1.0220840313   0.113518753
#>  [168,]  -1.6857497704  -3.1409965188  -3.845217142
#>  [169,]   0.9367039644   1.2494182539   1.861425559
#>  [170,]   2.9819339507   4.7451837060   6.351789102
#>  [171,]  -0.1128758880  -0.6259855920  -0.488149725
#>  [172,]   2.1141942767   3.4989159196   4.578108984
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#>   [173,]  -1.7421701790  -3.1643780322  -3.928548001
#>   [174,]   0.1698557072   0.5268082521   0.504163126
#>   [175,]   0.7399272522   0.2152634218   1.042136378
#>   [176,]   1.8848555835   4.4578312399   4.824286167
#>   [177,]   0.0347557759   0.3203414430   0.221115832
#>   [178,]  -0.7900975215  -0.2494757702  -1.123684102
#>   [179,]  -0.9180652309  -2.1628983019  -2.345126619
#>   [180,]  -0.2641149938  -0.1909869573  -0.435335775
#>   [181,]  -0.1040643993   0.9565258709   0.401065627
#>   [182,]   1.9841385745   3.4112118225   4.367260075
#>   [183,]  -0.3923504431  -1.6281900629  -1.392830316
#>   [184,]  -1.1126875949  -2.2559269112  -2.639443721
#>   [185,]   0.8169510608   1.6253456455   1.920720093
#>   [186,]  -0.2565035047  -0.5560977141  -0.628465587
#>   [187,]   1.1562644784   1.2998398071   2.163194892
#>   [188,]  -2.9502270088  -4.6430712190  -6.255583037
#>   [189,]  -0.5280868544  -1.3091695950  -1.385047849
#>   [190,]  -0.4689930211  -1.0156577652  -1.148472268
#>   [191,]   0.6101696504   0.8941530766   1.257086630
#>   [192,]  -1.2313952448  -0.9695036738  -2.073558702
#>   [193,]  -0.9426940610  -2.9014758380  -2.785717878
#>   [194,]   0.5710807637   0.3155665662   0.887252296
#>   [195,]  -1.7521384800  -3.7457917712  -4.263638552
#>   [196,]  -0.3905925261  -0.5463520160  -0.790263408
#>   [197,]  -0.1259660110   0.7218955887   0.243544781
#>   [198,]   0.8394084727   0.1646714252   1.138110991
#>   [199,]  -1.0838719254  -2.1302732054  -2.533778623
#>   [200,]  -0.5936486262  -1.0181965363  -1.305324177
#>   [201,]   0.8382903408   0.1047802480   1.103479608
#>   [202,]  -0.9571895960  -3.7002310066  -3.247069191
#>   [203,]  -0.7519833894  -1.1489362918  -1.575319487
#>   [204,]   0.4619655712   2.1960314155   1.794767137
#>   [205,]  -0.4111527961  -0.1214241580  -0.580084475
#>   [206,]   1.3450689916   2.8271047268   3.246198356
#>   [207,]  -0.2457738645  -0.0868198596  -0.354656383
#>   [208,]   1.5543467911   2.6722761464   3.421240124
#>   [209,]  -0.9681496928  -2.3556617856  -2.514556585
#>   [210,]   2.5623006999   2.8441104030   4.773498908
#>   [211,]  -2.7506310433  -5.0570414581  -6.236427090
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#>   [213,]  -1.3642430197  -4.2762799851  -4.074339573
#>   [214,]   0.1849342670   0.1132445438   0.293455239
#>   [215,]   0.4390759063   1.2553977131   1.244211869
#>   [216,]   0.7274614752   1.8418700656   1.929290393
#>   [217,]  -1.4060463148  -2.2246552521  -2.987901600
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#> [1239,]   1.7292091640   2.3857281580   3.480267800
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#> [1493,] -0.1978625504 -0.5650071283 -0.560285865
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#> [1503,]  1.0911284653  2.7098194315  2.864451271
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#> [1523,] -0.8342335372 -1.6225205631 -1.940703187
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#> [1568,]  -0.5589562726  -1.2152222271  -1.371404529
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#> [1572,]  -0.7520802068  -0.8554185592  -1.412550164
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#> [1748,]  -0.1662318449  -1.0625990990  -0.796985731
#> [1749,]  -1.9378287155  -2.6775097380  -3.902338687
#> [1750,]   0.6078402166   1.7691627174   1.739775589
#> [1751,]  -1.3991399732  -2.1249816105  -2.923974835
#> [1752,]   1.2541906165   3.1549733774   3.314828250
#> [1753,]   0.7734915725   0.4881714209   1.235442914
#> [1754,]   1.2886856237   1.1796427072   2.261617002
#> [1755,]   0.5742897259   1.8999956433   1.770545608
#> [1756,]   0.8749805910   1.0401035690   1.668296884
#> [1757,]  -1.7602476687  -2.5952638037  -3.635255693
#> [1758,]  -1.6303064466  -1.8026735989  -3.033367260
#> [1759,]  -1.4678912057  -3.2797217612  -3.650538656
#> [1760,]   1.0590031145   2.2774280689   2.584432511
#> [1761,]   0.9634151389   1.5724342189   2.073994185
#> [1762,]  -0.5840598990  -1.6661798932  -1.652970863
#> [1763,]  -0.5907507369  -0.0795183640  -0.780783483
#> [1764,]   1.2142201680   1.6876257377   2.450669411
#> [1765,]   0.6627099653   0.9993932403   1.381007216
#> [1766,]   0.8914949901   1.6268548076   2.014512375
#> [1767,]   0.3132411617   0.6381066727   0.744727827
#> [1768,]   1.4154527519   1.5535107393   2.627174130
#> [1769,]   1.5521342000   3.3549515305   3.797337324
#> [1770,]   2.9573062781   4.7731139147   6.336578993
#> [1771,]   0.4457522631   0.7348013099   0.963627943
#> [1772,]  -1.1549343734  -2.8516995213  -3.022753447
#> [1773,]   1.5721623058   2.3641684401   3.272468830
#> [1774,]   2.7553285791   4.7108979628   6.050189674
#> [1775,]  -0.0358989849   0.5494625664   0.260163418
#> [1776,]   0.6678799180   0.3480408464   1.025980733
#> [1777,]   1.1228612143   1.2375059805   2.086949039
#> [1778,]   1.1904287346   2.1471296903   2.676007434
#> [1779,]  -0.1520368087  -0.6919278720  -0.573577799
#> [1780,]   1.0134237097   2.0746345594   2.415054016
#> [1781,]   0.3393961685  -0.0004283469   0.422982385
#> [1782,]  -2.0389347499  -3.5811644570  -4.529906384
#> [1783,]  -1.5545349414  -2.7414769236  -3.459878278
#> [1784,]   0.5523820822   0.9190251560   1.198829674
#> [1785,]   1.3890948306   2.9666265657   3.378526459
#> [1786,]   0.7614337628   0.5807601726   1.271789952
#> [1787,]  -0.5284526632  -1.7817978701  -1.647792910
#> [1788,]   0.5626116405   0.1961902631   0.810442623
#> [1789,]  -1.1292879655  -2.0787391680  -2.561812265
#> [1790,]   1.8447517462   3.5500296863   4.270485645
#> [1791,]   1.1070366893   1.7937069175   2.375884413
#> [1792,]  -0.0188554409   0.1911201096   0.082551309
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#> [1793,]   1.5566822795   2.2296498917   3.178513391
#> [1794,]  -1.3089111539  -2.4221629521  -2.976384540
#> [1795,]  -0.0960672955  -0.0340144386  -0.138670547
#> [1796,]   0.2220904817   0.3768860984   0.486098306
#> [1797,]  -2.3782096231  -3.4970379706  -4.906288553
#> [1798,]  -1.0947545700  -0.7086969554  -1.758433759
#> [1799,]   0.3485370273   1.4509271747   1.239822399
#> [1800,]  -0.6382893002  -0.1476541832  -0.877875628
#> [1801,]  -0.4333891793  -0.6270392035  -0.888407972
#> [1802,]   0.1250213834   0.9647058807   0.691270489
#> [1803,]   0.5416077339   1.4519227080   1.481130111
#> [1804,]  -0.5328332491  -1.7154736233  -1.616448231
#> [1805,]  -1.0369995411  -2.3196213156  -2.580409989
#> [1806,]  -1.4344474985  -3.0008584236  -3.454077559
#> [1807,]  -0.3029798676  -0.8084113503  -0.826444168
#> [1808,]   1.1549552492   1.2892974138   2.155711723
#> [1809,]  -0.9108049270  -1.8147075844  -2.142841898
#> [1810,]   0.1283475095   0.8799237210   0.648367551
#> [1811,]  -0.1553785767   0.5204076598   0.095050547
#> [1812,]   1.0278489199   1.8048999023   2.283350517
#> [1813,]   0.9577307029   2.0473060682   2.330439804
#> [1814,]  -2.1779420227  -3.6171056099  -4.723191453
#> [1815,]   0.2935959410   0.6573897280   0.730931926
#> [1816,]  -0.0436327506  -0.6683736321  -0.425328533
#> [1817,]  -0.3816282503  -0.7181877569  -0.874446780
#> [1818,]  -0.6201759113  -2.5016451751  -2.161655046
#> [1819,]  -0.5007599580   1.0347626335  -0.050187516
#> [1820,]  -1.5385661593  -3.0317190201  -3.601037744
#> [1821,]  -0.3739794456  -0.6558928440  -0.830337808
#> [1822,]  -2.0371318067  -3.2905914680  -4.366402308
#> [1823,]  -0.1319465020  -1.0530550840  -0.748936079
#> [1824,]  -0.1446031113  -0.0295109587  -0.196694477
#> [1825,]  -0.5068772366  -0.9629843545  -1.166481574
#> [1826,]   0.5808767333   0.3826336977   0.936687121
#> [1827,]   0.6231648845   0.1521438513   0.861507368
#> [1828,]  -0.4393053388  -0.4968786427  -0.823551641
#> [1829,]  -3.0270151209  -5.1264327451  -6.619581656
#> [1830,]   1.3767373342   3.1744154098   3.478431022
#> [1831,]   0.5395933821   0.5002201053   0.950463157
#> [1832,]   0.3332793902   0.6946999843   0.801122008
#> [1833,]  -0.7428100223  -2.8674670919  -2.517593128
#> [1834,]  -0.8548986453  -0.9879543338  -1.614314466
#> [1835,]   0.4957990426   0.6159551070   0.960080589
#> [1836,]  -1.5862652211  -2.0619989620  -3.122363469
#> [1837,]  -0.1441454656   0.4625041766   0.076923998
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#> [1838,]   0.5844609986   1.6503333347   1.644676849
#> [1839,]   0.7181327787   0.7663569556   1.320792952
#> [1840,]  -2.0526267898  -2.8852983782  -4.160803539
#> [1841,]  -0.0221489579  -0.5245293146  -0.318711107
#> [1842,]   0.1840795768  -0.3747893005   0.021551108
#> [1843,]   1.7238926684   4.2735894747   4.521322229
#> [1844,]  -0.7302163209  -1.3525842898  -1.661192509
#> [1845,]   1.0082763029   1.3297675449   1.995265298
#> [1846,]  -0.2126848215   0.1973320820  -0.155702591
#> [1847,]  -1.4359810219  -2.8688132314  -3.382710278
#> [1848,]  -0.3594175522  -0.2993935747  -0.614337256
#> [1849,]  -0.1634485541   0.2231780067  -0.079962563
#> [1850,]   0.0774409437  -0.3364697269  -0.090159334
#> [1851,]  -0.6338398299   0.3883446115  -0.574870340
#> [1852,]  -0.6154887131  -1.1810368403  -1.422927870
#> [1853,]  -0.6371305737  -0.2164920490  -0.914632853
#> [1854,]  -1.4844918452  -2.4218436531  -3.195152883
#> [1855,]   0.2388234051   0.2839403711   0.455382933
#> [1856,]   0.0861253000   0.2208504830   0.229959264
#> [1857,]   0.9264368185   0.8336334852   1.617879499
#> [1858,]  -0.7460521964  -0.0292052280  -0.946519551
#> [1859,]   0.4396179965   1.1175168616   1.168369745
#> [1860,]   0.6534828622   2.7864192184   2.361225805
#> [1861,]   1.0945887983   2.2270890754   2.600871099
#> [1862,]   0.8807505205   0.5049965040   1.378529852
#> [1863,]   0.1029427586   0.1942328526   0.236158621
#> [1864,]  -0.7110330986  -1.4021981510  -1.664805038
#> [1865,]   0.6213304103   1.1859988101   1.432966033
#> [1866,]  -2.3508205741  -3.9432097844  -5.119741644
#> [1867,]   1.2207398992   1.5991004676   2.409671564
#> [1868,]   1.1716420255   3.3816631413   3.337695169
#> [1869,]   0.4315116672   0.7782070480   0.969958578
#> [1870,]  -0.1624153660  -0.1856013607  -0.305529633
#> [1871,]   0.5951016830   1.3311072041   1.480788428
#> [1872,]   0.6673663691   0.4174319275   1.063849493
#> [1873,]   2.9104110467   5.1438174304   6.483826527
#> [1874,]  -1.0523157332  -1.0387034481  -1.888653181
#> [1875,]   1.8623771115   4.3814266338   4.753854613
#> [1876,]  -0.0892249696   0.3016096877   0.056119032
#> [1877,]  -1.2842937940  -1.4864201118  -2.426389095
#> [1878,]   2.2704124793   3.3900765699   4.712508615
#> [1879,]  -2.1865269000  -2.7728843166  -4.265389148
#> [1880,]   1.1930565175   2.7593494334   3.019040551
#> [1881,]  -1.9423066082  -4.3871212929  -4.856685363
#> [1882,]   0.7330705527   0.8000201466   1.358101713
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#> [1883,]  -1.1503681817  -2.1172917062  -2.609493910
#> [1884,]  -0.1294250068  -0.4064004279  -0.386925566
#> [1885,]  -0.2010627980   0.0652586300  -0.214505401
#> [1886,]  -2.1310927191  -2.8761431624  -4.253568191
#> [1887,]   2.3828499990   5.7440654266   6.159081167
#> [1888,]   0.1979711066   0.6414076070   0.602820300
#> [1889,]   0.7767404771   1.4143677935   1.753494441
#> [1890,]  -0.8272712287  -1.3202101778  -1.764251723
#> [1891,]  -1.4316734448  -1.9196883340  -2.850614237
#> [1892,]   0.5205041289   0.2102998219   0.765765629
#> [1893,]   0.2791975316  -0.4795416865   0.082028069
#> [1894,]   1.7135850906   1.8034907373   3.137667508
#> [1895,]  -1.8664696069  -2.5532017240  -3.744369590
#> [1896,]   1.1311557825   0.8944264182   1.906897404
#> [1897,]   1.0423041258   1.0179402168   1.864646187
#> [1898,]   0.2048511051  -0.0748515772   0.213905658
#> [1899,]  -1.8640582229  -3.4233200088  -4.224241862
#> [1900,]   0.6981846566  -0.0403642535   0.848221556
#> [1901,]  -2.0731733025  -3.4909038338  -4.522510294
#> [1902,]   1.1549648622   2.6914102868   2.933837652
#> [1903,]   0.8077768956   0.6106939281   1.346190875
#> [1904,]   0.1151714623  -0.6135041836  -0.196852671
#> [1905,]   0.7440982944   2.6831852201   2.416930854
#> [1906,]  -1.3832792981  -2.4898987446  -3.106710627
#> [1907,]   0.1647743564  -0.4895301115  -0.066198455
#> [1908,]   0.8509717301   1.3867102769   1.830710536
#> [1909,]   0.5496104308   0.8438040614   1.153628923
#> [1910,]   1.5191643940   1.8976436707   2.947479801
#> [1911,]  -0.8062926173  -0.6646943054  -1.374307959
#> [1912,]  -1.7169853549  -3.8189902766  -4.260425428
#> [1913,]   0.1119876522   0.6907590414   0.522988665
#> [1914,]   1.4575791603   1.6801718046   2.749996490
#> [1915,]   0.5742085876   0.3208576940   0.894088984
#> [1916,]  -0.7812610371  -1.5249027841  -1.820473779
#> [1917,]   0.3626169539   0.8930026124   0.947755007
#> [1918,]  -1.0769184301  -1.2045321327  -2.011360220
#> [1919,]   0.9228577929   2.3711485248   2.466673001
#> [1920,]  -0.3406203988  -1.0033643535  -0.981571897
#> [1921,]   1.0831435434   1.8704209348   2.388663215
#> [1922,]  -1.0062061036  -0.7747145380  -1.684652621
#> [1923,]  -1.5243602830  -3.0281943442  -3.581367258
#> [1924,]  -0.3650676708  -1.8407859736  -1.476791085
#> [1925,]   0.5166110114   0.6795358154   1.021317321
#> [1926,]  -0.1103124443  -0.3878313854  -0.352787549
#> [1927,]  -1.2290131958  -1.8677228280  -2.569062360
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#> [1928,]    1.6295113949    4.1775590831    4.350337859
#> [1929,]    1.1998085031    2.7001708000    2.994618475
#> [1930,]    1.4538972035    3.1894590167    3.582996377
#> [1931,]    1.2776764903    0.8516005262    2.065839161
#> [1932,]   -0.9409546639   -2.4034497619   -2.507165264
#> [1933,]   -1.6663188416   -1.9816157166   -3.177579365
#> [1934,]   -1.3680560337   -2.5530520644   -3.122774976
#> [1935,]    1.0796001834    2.5869456188    2.781885917
#> [1936,]    0.3160441021    1.6467203126    1.307961378
#> [1937,]    0.5810423440    0.6915687695    1.108339664
#> [1938,]    0.9078942076    1.8136580198    2.138629826
#> [1939,]   -1.3727850318   -2.3778741613   -3.031455538
#> [1940,]   -0.0553203839    0.8415972338    0.398067838
#> [1941,]    1.3400802849    2.2015533572    2.892822721
#> [1942,]    0.9885612628    1.6572940482    2.152444541
#> [1943,]    0.0374883186    1.5560244763    0.910275605
#> [1944,]    0.8123458986    0.5385242157    1.311837160
#> [1945,]    0.0501377955    0.2060115060    0.176848569
#> [1946,]   -1.6358367409   -2.7795218284   -3.582373293
#> [1947,]    0.3069357323   -0.4311744661    0.143458822
#> [1948,]   -1.6178719316   -2.7239175143   -3.529113476
#> [1949,]    0.3148882687   -0.0971570283    0.338741166
#> [1950,]    0.8812432597    0.7068971837    1.491190711
#> [1951,]   -0.1194464037   -0.7983869004   -0.592018532
#> [1952,]   -0.4353464307   -0.4842628712   -0.811613738
#> [1953,]   -0.8517416392   -0.9670990948   -1.598803959
#> [1954,]   -0.3663810245   -0.6464539496   -0.815624541
#> [1955,]   -0.2795143531   -0.4388238955   -0.592077587
#> [1956,]   -0.0319849951    0.3342656212    0.145618788
#> [1957,]    0.7041943484    0.9350821116    1.397047412
#> [1958,]    2.1233842996    3.0601629043    4.346079202
#> [1959,]    0.8332621800    1.5073195440    1.875560182
#> [1960,]   -1.4824338845   -3.5555987848   -3.821773278
#> [1961,]    0.6914831563    0.8505487569    1.334284342
#> [1962,]    0.9151978390    1.9950404936    2.248396984
#> [1963,]    2.0934065234    2.8058315550    4.167554276
#> [1964,]   -1.7407668001   -3.3807441565   -4.046872157
#> [1965,]    1.0704446586    2.3047556961    2.613865572
#> [1966,]   -0.4693174599    0.0927580753   -0.533752452
#> [1967,]    0.1679950745   -0.4874328723   -0.061018405
#> [1968,]   -0.2392431244    0.1728793237   -0.202390510
#> [1969,]    1.2182943310    1.6932070374    2.458847197
#> [1970,]   -0.0525269606   -1.7122082768   -1.015703956
#> [1971,]    1.5685086972    2.6113542739    3.405090644
#> [1972,]    1.9301114074    3.3285105920    4.253993579
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#> [1973,]   1.3129897263   2.8239684003   3.204455637
#> [1974,] -1.1894235448 -1.7192092612 -2.437276061
#> [1975,] -0.3485617169 -1.6812182134 -1.367655071
#> [1976,] -1.1424377782 -1.8364635200 -2.443756973
#> [1977,]   0.1665462359   0.3835436648   0.420530435
#> [1978,] -0.2744029379 -0.1288714024 -0.413693100
#> [1979,]   1.0107903286   1.8157840624   2.268119055
#> [1980,]   1.4248980778   2.0201853412   2.897937124
#> [1981,] -0.7798530968 -1.2218431787 -1.650532714
#> [1982,] -1.0861073212 -0.6408853714 -1.710018226
#> [1983,] -0.2280293887   0.5733250686   0.033823412
#> [1984,] -0.6764551679 -2.1780683197 -2.052262523
#> [1985,] -0.1303135830 -1.5270652283 -1.009955647
#> [1986,]   1.5038468374   2.3645255108   3.187478994
#> [1987,]   0.4285077075   0.4022282073   0.757560186
#> [1988,] -1.1474158860 -0.8352392727 -1.894327033
#> [1989,]   0.8894905913   0.9773815715   1.651582476
#> [1990,] -0.2961305113 -0.2424040974 -0.503792833
#> [1991,]   1.6738796395   2.4384049076   3.440506402
#> [1992,] -0.1856181543   0.2659546197 -0.083868373
#> [1993,]   0.6903224879   0.9819342564   1.405750463
#> [1994,]   0.1798966034   1.3154523013   0.954348347
#> [1995,]   1.1006031864   0.3559122566   1.569946126
#> [1996,] -1.5488477898 -1.9572586600 -3.017578213
#> [1997,]   0.4901648679   1.5663479592   1.480483130
#> [1998,] -0.5513802501 -0.8600132382 -1.164831266
#> [1999,]   0.5913945392   2.0454742769   1.872609512
#> [2000,]   0.0220714291   0.1792725632   0.127011389
#>
#> [[1]][[19]]$value[[1]]$decomposition
#> [1] "eigen"
#>
#>
#>
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#> [1] TRUE
#>
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#> [[1]][[20]]$value
#> [[1]][[20]]$value[[1]]
#> [[1]][[20]]$value[[1]]$M
#> [1] 2
#>
#> [[1]][[20]]$value[[1]]$est
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#>      [,1] [,2] [,3]
#> [1,]    1    0    0
#> [2,]    0    1    0
#> [3,]    0    0    1
#>
#> [[1]][[20]]$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/