

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
```

```
#> 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-semccci-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 | 0.1113 | 100 | 0.2679 | 0.2799 | 0.3354 | 0.7553 | 0.8397 | 0.8763 |
| #> visual=~x3 | 0.7294 | 0.1010 | 100 | 0.4610 | 0.4622 | 0.4993 | 0.8882 | 0.9102 | 0.9166 |
| #> textual=~x4 | 1.0000 | 0.0000 | 100 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| #> textual=~x5 | 1.1131 | 0.0564 | 100 | 0.9790 | 0.9804 | 0.9911 | 1.2274 | 1.2437 | 1.2493 |
| #> textual=~x6 | 0.9261 | 0.0515 | 100 | 0.8241 | 0.8246 | 0.8340 | 1.0229 | 1.0551 | 1.0743 |
| #> speed=~x7 | 1.0000 | 0.0000 | 100 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| #> speed=~x8 | 1.1800 | 0.1813 | 100 | 0.7316 | 0.7510 | 0.7971 | 1.4948 | 1.6729 | 1.6786 |
| #> speed=~x9 | 1.0815 | 0.1677 | 100 | 0.6478 | 0.6496 | 0.6675 | 1.3810 | 1.4213 | 1.4251 |
| #> x1~~x1 | 0.5491 | 0.0990 | 100 | 0.2884 | 0.2917 | 0.3328 | 0.7292 | 0.7760 | 0.8107 |
| #> x2~~x2 | 1.1338 | 0.0971 | 100 | 0.8864 | 0.9084 | 0.9482 | 1.3021 | 1.3293 | 1.3317 |
| #> x3~~x3 | 0.8443 | 0.0940 | 100 | 0.5891 | 0.6219 | 0.6757 | 1.0011 | 1.0465 | 1.0559 |
| #> x4~~x4 | 0.3712 | 0.0447 | 100 | 0.2614 | 0.2674 | 0.2886 | 0.4531 | 0.4697 | 0.4747 |
| #> x5~~x5 | 0.4463 | 0.0494 | 100 | 0.3511 | 0.3548 | 0.3668 | 0.5622 | 0.5794 | 0.5811 |
| #> x6~~x6 | 0.3562 | 0.0402 | 100 | 0.2600 | 0.2652 | 0.2728 | 0.4196 | 0.4379 | 0.4442 |
| #> x7~~x7 | 0.7994 | 0.0825 | 100 | 0.5959 | 0.6128 | 0.6506 | 0.9674 | 0.9860 | 0.9975 |
| #> x8~~x8 | 0.4877 | 0.0701 | 100 | 0.2872 | 0.2982 | 0.3522 | 0.6132 | 0.6503 | 0.6756 |
| #> x9~~x9 | 0.5661 | 0.0724 | 100 | 0.3612 | 0.3737 | 0.4130 | 0.6985 | 0.7201 | 0.7278 |
| #> visual~~visual | 0.8093 | 0.1275 | 100 | 0.5574 | 0.5676 | 0.6003 | 1.0946 | 1.1234 | 1.1394 |
| #> textual~~textual | 0.9795 | 0.1247 | 100 | 0.6728 | 0.6874 | 0.7510 | 1.2183 | 1.2631 | 1.2853 |
| #> speed~~speed | 0.3837 | 0.0891 | 100 | 0.1530 | 0.1551 | 0.2003 | 0.5297 | 0.5950 | 0.6186 |
| #> visual~~textual | 0.4082 | 0.0810 | 100 | 0.2250 | 0.2375 | 0.2762 | 0.5971 | 0.6135 | 0.6210 |
| #> visual~~speed | 0.2622 | 0.0542 | 100 | 0.1073 | 0.1177 | 0.1403 | 0.3626 | 0.3932 | 0.4006 |
| #> textual~~speed | 0.1735 | 0.0466 | 100 | 0.0665 | 0.0721 | 0.0884 | 0.2682 | 0.2753 | 0.2768 |

```
#> 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 | 0.0989 | 100 | 0.2664 | 0.2965 | 0.3882 | 0.7210 | 0.7274 | 0.7312 |
| #> visual=~x3 | 0.7294 | 0.1106 | 100 | 0.3476 | 0.4176 | 0.5094 | 0.9463 | 0.9942 | 1.0049 |
| #> textual=~x4 | 1.0000 | 0.0000 | 100 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| #> textual=~x5 | 1.1131 | 0.0544 | 100 | 0.9865 | 0.9896 | 1.0051 | 1.1999 | 1.2298 | 1.2346 |
| #> textual=~x6 | 0.9261 | 0.0502 | 100 | 0.7995 | 0.8134 | 0.8376 | 1.0330 | 1.0453 | 1.0464 |
| #> speed=~x7 | 1.0000 | 0.0000 | 100 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| #> speed=~x8 | 1.1800 | 0.1583 | 100 | 0.8424 | 0.8541 | 0.8921 | 1.5524 | 1.5870 | 1.5988 |
| #> speed=~x9 | 1.0815 | 0.1640 | 100 | 0.6873 | 0.7179 | 0.8255 | 1.4575 | 1.5557 | 1.5863 |
| #> x1~~x1 | 0.5491 | 0.1204 | 100 | 0.3046 | 0.3047 | 0.3268 | 0.7528 | 0.8918 | 0.9489 |
| #> x2~~x2 | 1.1338 | 0.0948 | 100 | 0.8657 | 0.9071 | 0.9789 | 1.3321 | 1.3646 | 1.3823 |
| #> x3~~x3 | 0.8443 | 0.0986 | 100 | 0.6297 | 0.6340 | 0.6661 | 1.0119 | 1.0870 | 1.1438 |
| #> x4~~x4 | 0.3712 | 0.0423 | 100 | 0.2974 | 0.2975 | 0.2984 | 0.4632 | 0.4782 | 0.4812 |
| #> x5~~x5 | 0.4463 | 0.0515 | 100 | 0.3218 | 0.3325 | 0.3464 | 0.5326 | 0.5688 | 0.5839 |
| #> x6~~x6 | 0.3562 | 0.0473 | 100 | 0.2489 | 0.2496 | 0.2680 | 0.4302 | 0.4615 | 0.4801 |
| #> x7~~x7 | 0.7994 | 0.0922 | 100 | 0.5645 | 0.5805 | 0.6047 | 0.9700 | 1.0335 | 1.0379 |

```

#> x8~~x8          0.4877 0.0689 100 0.3261 0.3261 0.3586 0.6185 0.6585 0.6799
#> x9~~x9          0.5661 0.0628 100 0.3941 0.3969 0.4234 0.6606 0.6738 0.6790
#> visual~~visual  0.8093 0.1528 100 0.3759 0.4297 0.5186 1.0611 1.0906 1.1160
#> textual~~textual 0.9795 0.0949 100 0.7777 0.7784 0.8105 1.1657 1.1915 1.1981
#> speed~~speed    0.3837 0.0859 100 0.1784 0.1945 0.2379 0.5480 0.6014 0.6191
#> visual~~textual 0.4082 0.0724 100 0.2420 0.2427 0.2612 0.5428 0.5690 0.5846
#> visual~~speed    0.2622 0.0586 100 0.0939 0.1130 0.1471 0.3633 0.4265 0.4272
#> textual~~speed   0.1735 0.0460 100 0.0287 0.0321 0.0730 0.2609 0.2785 0.2901
#> Standardized Monte Carlo Confidence Intervals
#>           est      se    R 0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> visual=~x1      0.7719 0.0476 100 0.6389 0.6559 0.6924 0.8655 0.8865 0.8870
#> visual=~x2      0.4236 0.0669 100 0.2417 0.2557 0.2855 0.5355 0.5517 0.5567
#> visual=~x3      0.5811 0.0571 100 0.4202 0.4236 0.4456 0.6636 0.6866 0.6913
#> textual=~x4      0.8516 0.0220 100 0.7903 0.7928 0.8021 0.8876 0.9040 0.9111
#> textual=~x5      0.8551 0.0195 100 0.7986 0.8044 0.8142 0.8837 0.8883 0.8898
#> textual=~x6      0.8380 0.0214 100 0.7856 0.7904 0.7990 0.8780 0.8861 0.8928
#> speed=~x7       0.5695 0.0578 100 0.3694 0.3728 0.4250 0.6560 0.6857 0.6858
#> speed=~x8       0.7230 0.0582 100 0.5734 0.5772 0.5944 0.8061 0.8273 0.8414
#> speed=~x9       0.6650 0.0600 100 0.4865 0.4982 0.5231 0.7541 0.7867 0.7897
#> x1~~x1          0.4042 0.0736 100 0.2133 0.2141 0.2510 0.5205 0.5694 0.5917
#> x2~~x2          0.8206 0.0552 100 0.6901 0.6956 0.7132 0.9185 0.9344 0.9415
#> x3~~x3          0.6623 0.0648 100 0.5221 0.5285 0.5596 0.8014 0.8206 0.8234
#> x4~~x4          0.2748 0.0375 100 0.1698 0.1828 0.2121 0.3566 0.3714 0.3754
#> x5~~x5          0.2689 0.0331 100 0.2082 0.2109 0.2190 0.3371 0.3529 0.3623
#> x6~~x6          0.2977 0.0359 100 0.2029 0.2148 0.2291 0.3616 0.3752 0.3828
#> x7~~x7          0.6757 0.0632 100 0.5296 0.5298 0.5697 0.8192 0.8610 0.8635
#> x8~~x8          0.4772 0.0820 100 0.2921 0.3153 0.3501 0.6467 0.6668 0.6712
#> x9~~x9          0.5578 0.0773 100 0.3764 0.3811 0.4314 0.7263 0.7516 0.7633
#> 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 0.0625 100 0.2720 0.3005 0.3433 0.5715 0.5825 0.5850
#> visual~~speed    0.4705 0.0771 100 0.2759 0.2763 0.3479 0.6253 0.6539 0.6599
#> textual~~speed   0.2830 0.0675 100 0.1077 0.1216 0.1730 0.4067 0.4893 0.5347
#> Standardized Monte Carlo Confidence Intervals
#>           est      se    R 0.05%   0.5%   2.5%  97.5%  99.5% 99.95%
#> visual=~x1      0.7719 0.0616 100 0.5767 0.6000 0.6430 0.8704 0.8812 0.8813
#> visual=~x2      0.4236 0.0542 100 0.2392 0.2638 0.3120 0.5210 0.5301 0.5321
#> visual=~x3      0.5811 0.0605 100 0.3163 0.3747 0.4489 0.6743 0.6951 0.6968
#> textual=~x4      0.8516 0.0186 100 0.7968 0.8032 0.8156 0.8810 0.8855 0.8857
#> textual=~x5      0.8551 0.0204 100 0.7807 0.7858 0.8092 0.8869 0.8899 0.8906
#> textual=~x6      0.8380 0.0244 100 0.7637 0.7731 0.7945 0.8844 0.8918 0.8937
#> speed=~x7       0.5695 0.0557 100 0.4168 0.4299 0.4557 0.6655 0.6991 0.7218
#> speed=~x8       0.7230 0.0506 100 0.5722 0.5816 0.6212 0.8065 0.8137 0.8151
#> speed=~x9       0.6650 0.0487 100 0.5546 0.5629 0.5855 0.7590 0.7823 0.7905
#> x1~~x1          0.4042 0.0929 100 0.2234 0.2235 0.2423 0.5866 0.6394 0.6673

```

```

#> x2~~x2      0.8206 0.0442 100 0.7169 0.7190 0.7285 0.9026 0.9296 0.9427
#> x3~~x3      0.6623 0.0665 100 0.5144 0.5168 0.5454 0.7985 0.8553 0.8992
#> x4~~x4      0.2748 0.0315 100 0.2155 0.2159 0.2239 0.3348 0.3549 0.3651
#> x5~~x5      0.2689 0.0344 100 0.2069 0.2080 0.2135 0.3452 0.3824 0.3904
#> x6~~x6      0.2977 0.0409 100 0.2014 0.2047 0.2178 0.3687 0.4022 0.4168
#> x7~~x7      0.6757 0.0632 100 0.4789 0.5107 0.5571 0.7923 0.8150 0.8263
#> x8~~x8      0.4772 0.0719 100 0.3356 0.3378 0.3496 0.6141 0.6616 0.6726
#> x9~~x9      0.5578 0.0655 100 0.3751 0.3880 0.4238 0.6572 0.6830 0.6924
#> 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 0.0650 100 0.2796 0.2824 0.3196 0.5764 0.6114 0.6290
#> visual~~speed   0.4705 0.0677 100 0.2662 0.2966 0.3447 0.5916 0.6383 0.6683
#> textual~~speed   0.2830 0.0692 100 0.0608 0.0627 0.1432 0.4171 0.4756 0.5132
#> 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 0.6.16 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]]$value
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#> [1] TRUE
#>
#>
#> [[1]][[1]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[2]]
#> [[1]][[2]]$value
#> [[1]][[2]]$value[[1]]
#> [1] TRUE
#>

```

```

#>
#> [[1]][[2]]$visible
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#>
#>
#> [[1]][[3]]
#> [[1]][[3]]$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  0.4204 20000    3.8608    4.1269    4.3979
#> alien67=~anomia67    1.0000  0.0000 20000    1.0000    1.0000    1.0000
#> alien67=~powerless67 0.9787  0.0613 20000    0.7837    0.8221    0.8582
#> alien71=~anomia71    1.0000  0.0000 20000    1.0000    1.0000    1.0000
#> alien71=~powerless71 0.9221  0.0595 20000    0.7239    0.7668    0.8050
#> alien71~alien67      0.6070  0.0510 20000    0.4356    0.4751    0.5090
#> alien71~ses         -0.2268  0.0523 20000   -0.3962   -0.3611   -0.3297
#> alien67~ses         -0.5750  0.0562 20000   -0.7613   -0.7221   -0.6843
#> anomia67~~anomia71    1.6229  0.3122 20000    0.5980    0.8260    1.0101
#> powerless67~~powerless71 0.3387  0.2592 20000   -0.4798   -0.3149   -0.1684
#> education~~education  2.8013  0.5081 20000    1.1183    1.5243    1.8122
#> sei~~sei            264.5971 18.1932 20000  206.6768  217.8422  228.7895
#> anomia67~~anomia67    4.7307  0.4516 20000    3.2906    3.5855    3.8564
#> powerless67~~powerless67 2.5634  0.4015 20000    1.2455    1.5187    1.7753
#> anomia71~~anomia71    4.3992  0.5161 20000    2.7773    3.0839    3.3771

```

```

#> powerless71~~powerless71 3.0699 0.4333 20000 1.6557 1.9703 2.2217
#> ses~~ses 6.7983 0.6480 20000 4.6230 5.1367 5.5165
#> alien67~~alien67 4.8415 0.4665 20000 3.2850 3.6597 3.9366
#> alien71~~alien71 4.0832 0.4038 20000 2.7507 3.0491 3.2932
#> 97.5% 99.5% 99.95%
#> ses=~education 1.0000 1.0000 1.0000
#> ses=~sei 6.0521 6.2928 6.5558
#> alien67=~anomia67 1.0000 1.0000 1.0000
#> alien67=~powerless67 1.0998 1.1396 1.1791
#> alien71=~anomia71 1.0000 1.0000 1.0000
#> alien71=~powerless71 1.0380 1.0729 1.1182
#> alien71~alien67 0.7087 0.7374 0.7700
#> alien71~ses -0.1225 -0.0918 -0.0508
#> alien67~ses -0.4638 -0.4274 -0.3927
#> anomia67~~anomia71 2.2407 2.4357 2.6307
#> powerless67~~powerless71 0.8476 1.0150 1.1569
#> education~~education 3.8044 4.1123 4.4758
#> sei~~sei 300.1882 310.6552 323.0238
#> anomia67~~anomia67 5.6258 5.8792 6.2613
#> powerless67~~powerless67 3.3481 3.5843 3.8446
#> anomia71~~anomia71 5.4150 5.7084 6.0452
#> powerless71~~powerless71 3.9271 4.2009 4.5435
#> ses~~ses 8.0595 8.4751 8.9368
#> alien67~~alien67 5.7566 6.0383 6.3362
#> alien71~~alien71 4.8673 5.0997 5.3748
#>
#>
#> [[1]][[5]]$visible
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#>
#>
#> [[1]][[6]]
#> [[1]][[6]]$value
#> [[1]][[6]]$value[[1]]
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#>
#>
#> [[1]][[6]]$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]]$value[[1]]
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#>
#>
#> [[1]][[10]]$visible
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#>
#>
#> [[1]][[11]]
#> [[1]][[11]]$value
#> [[1]][[11]]$value[[1]]
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#>
#>
#> [[1]][[11]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[12]]

```

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

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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,] 1.0727428736 2.314749679 2.622277641
#> [2,] -1.8574203408 -3.481572579 -4.248292296
#> [3,] -0.1780160680 -0.173131073 -0.318062903
#> [4,] -0.1935793715 -0.222504057 -0.364869964
#> [5,] 0.6448987592 1.338694603 1.547095055
#> [6,] -1.3980605368 -2.880150401 -3.341715861
#> [7,] 0.9313070168 1.864572053 2.196080279
#> [8,] 0.6613645906 0.905628284 1.327293936
#> [9,] -0.2144038875 -0.141381688 -0.345818192
#> [10,] -1.2063621714 -1.637786506 -2.413211963
#> [11,] 0.5399057471 1.354543446 1.424966355
#> [12,] -0.8869686347 -1.888241023 -2.153926508
#> [13,] 1.0045978106 1.067046818 1.844879289
#> [14,] -2.1768653780 -4.112041682 -4.996517697
#> [15,] 1.8234031395 1.898461970 3.327313433
#> [16,] 1.4836617749 2.642793048 3.316735466
#> [17,] -0.6330953016 -2.155134878 -1.985466554
#> [18,] -0.7005455331 -0.475657996 -1.137536264
#> [19,] 0.8593266152 1.981057204 2.170966568
#> [20,] 0.9040368367 2.293701424 2.400223754
#> [21,] 0.5369334230 0.734773809 1.077313728
#> [22,] 2.8517920087 4.992915893 6.326985746
#> [23,] 1.2728736443 1.145318320 2.222851188
#> [24,] 0.9691393715 2.274001777 2.470472808
#> [25,] 0.8152707347 1.496916297 1.847351850
#> [26,] 0.6355935397 0.454123856 1.044591907
#> [27,] -0.1736482301 -0.025238936 -0.230542354
#> [28,] -1.7172155076 -2.750989910 -3.668016935
#> [29,] 0.7344625479 1.370902125 1.676653100
#> [30,] -0.4034674582 -1.057445827 -1.089953852
#> [31,] -1.3562303195 -2.771436550 -3.229222797
#> [32,] 0.9186621234 2.249868753 2.394135891
#> [33,] -0.9312476458 -1.199775532 -1.827072008
#> [34,] -0.5997120116 -0.931808891 -1.264943568
#> [35,] -0.7639297311 -0.262750710 -1.098420437
#> [36,] -2.4463241037 -3.395426552 -4.934835838
#> [37,] -0.3548391639 -0.368721007 -0.647101921

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#> [38,] 0.0019203765 0.756683020 0.422322066
#> [39,] -1.6006448718 -1.026848678 -2.565829532
#> [40,] 0.0984526442 0.345502646 0.314507942
#> [41,] 0.6153003782 1.780475832 1.755356564
#> [42,] 0.7765351881 1.662581425 1.890986623
#> [43,] -1.1313650165 -2.698673967 -2.908440164
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#> [70,] -0.5209129148 -1.372061810 -1.411004639
#> [71,] -0.6169738234 -1.017510416 -1.334029454
#> [72,] 0.2997104949 -0.146353429 0.292512849
#> [73,] -1.5327646023 -1.910456331 -2.971549473
#> [74,] 0.1702754011 0.867274714 0.693631108
#> [75,] -0.1811430432 -1.171140941 -0.875815869
#> [76,] 1.5997246570 2.655533477 3.468533917
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#> [79,] -0.7931552875 -1.926907580 -2.058401498
#> [80,] -0.0438918689 1.665060542 0.869306623
#> [81,] -1.3997368402 -1.852234452 -2.773355862
#> [82,] 0.3734316802 0.793575406 0.906062814

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#> [83,] -1.4223088170 -1.981977878 -2.873504826
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#> [85,] 2.9717850263 4.628988785 6.274650284
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#> [87,] -0.6196370009 0.170205712 -0.678217658
#> [88,] 1.0963583135 2.057295933 2.508849564
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#> [91,] 1.2940568752 3.135010331 3.353462007
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#> [111,] -1.3020558769 -2.871428128 -3.217159512
#> [112,] 1.1975064155 2.147430120 2.684999884
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#> [114,] -0.2687387582 -0.791303684 -0.774252165
#> [115,] 0.5992032864 1.235021471 1.432579485
#> [116,] -1.0802267958 -1.623659638 -2.248083902
#> [117,] 1.7791968634 3.027174376 3.898577237
#> [118,] -0.9721827365 -0.786001609 -1.648490028
#> [119,] -0.5825262525 -1.871720254 -1.765124732
#> [120,] 0.0155004231 -0.781978367 -0.414636543
#> [121,] -0.3181237533 -0.412379097 -0.625546965
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#> [123,] 0.5077701610 -0.519611151 0.344816600
#> [124,] 1.2300994250 1.860157751 2.566218564
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#> [126,] 1.4342660547 1.297594792 2.508611299
#> [127,] -0.0474028089 -0.111158150 -0.120798455

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#> [159,] -1.6063951541 -1.617650278 -2.900870170
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#> [163,] -0.2302903131 -0.814685938 -0.739283910
#> [164,] -0.9997158368 -1.306262627 -1.971546326
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#> [168,] -1.0795457111 -3.158291631 -3.098891107
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#> [170,]  1.1482902466  1.210329792  2.103576877
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#> [172,]  1.5592396524  3.670596752  3.981367561

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#> [173,] 1.1198392591 1.457704388 2.205381620
#> [174,] -0.4948655895 -0.916614933 -1.125770208
#> [175,] 0.4453892359 1.888073917 1.603193267
#> [176,] -0.7158420054 -2.298807110 -2.168382080
#> [177,] 0.2332696534 1.070403113 0.884911412
#> [178,] -1.3013732755 -1.848081219 -2.648393633
#> [179,] -0.7695376315 -1.441800058 -1.759736398
#> [180,] 0.4231445976 0.888436120 1.020697532
#> [181,] 0.0758591174 0.511216722 0.378298649
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#> [183,] -0.3172228210 0.668086806 -0.024810182
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#> [186,] -1.8437765231 -2.994936939 -3.961216327
#> [187,] -0.6461366372 -1.358871691 -1.559836103
#> [188,] 1.1452468462 1.950529533 2.510561685
#> [189,] -0.2424555968 0.320769240 -0.124323686
#> [190,] 1.5989467525 1.609141682 2.886860250
#> [191,] -0.2659150078 -1.210863361 -1.003569060
#> [192,] 2.0734994680 4.186234344 4.908796337
#> [193,] -0.0207378782 -0.367273817 -0.229681303
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#> [218,] 0.2658819603 1.019677931 0.897427941
#> [219,] 1.2796270732 2.875411066 3.191401615
#> [220,] -1.8208047687 -3.205829157 -4.049607370
#> [221,] 0.7853386195 2.020327373 2.100498346
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#> [263,] -1.1110258502 -2.477558843 -2.760368002
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#> [1432,] -0.0962808043 0.059203054 -0.087204983

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#> [1956,]  0.9087932592  1.191212065  1.794319481
#> [1957,] -0.7027084921 -0.735307762 -1.284328179
#> [1958,]  0.7148776159  2.224298315  2.125830244
#> [1959,]  0.7991626507  1.144923332  1.631924039
#> [1960,]  1.6000198495  4.103935043  4.272704244
#> [1961,]  0.2331291943  1.281297266  1.001773688
#> [1962,]  0.5213054660 -0.227945867  0.523556871
#> [1963,] -0.2262517122 -0.656934506 -0.646702416
#> [1964,] -0.8420662249 -1.518681550 -1.892844084
#> [1965,] -1.4367088867 -2.994525093 -3.453382730
#> [1966,]  0.8508330344  1.269915299  1.765721263
#> [1967,] -1.4132539843 -1.553053722 -2.624178686
#> [1968,]  0.9042568803  1.177204505  1.780889100
#> [1969,] -0.0706293092  0.542884432  0.213204822
#> [1970,]  1.6497180357  3.581994763  4.045021865
#> [1971,] -1.0420239551 -1.311437188 -2.027175351
#> [1972,] -0.5418423742 -1.785634255 -1.666618640

```

```

#> [1973,] -0.2669729130 -0.875897424 -0.818996175
#> [1974,]  1.4510190603  2.418018323  3.151290105
#> [1975,]  1.4263603914  2.568672284  3.204147888
#> [1976,]  0.5303313239  0.882705914  1.151177169
#> [1977,]  0.3311868552  0.226044071  0.538428249
#> [1978,]  0.3182443027  0.262528782  0.542536637
#> [1979,]  0.4387503601  1.048298669  1.128874621
#> [1980,] -1.1032186389 -2.520648527 -2.774545539
#> [1981,]  0.6543396225  1.738524737  1.780756604
#> [1982,] -0.7739536061 -1.768614620 -1.946611427
#> [1983,]  1.3200671693  1.307097083  2.371480991
#> [1984,]  2.2192366905  3.697465982  4.819281704
#> [1985,] -0.0040586774 -0.088370341 -0.054102928
#> [1986,]  1.8115656903  2.861953813  3.847250009
#> [1987,]  0.3408585143  0.332531383  0.609584610
#> [1988,]  0.4222992876  0.896477794  1.024106240
#> [1989,]  1.6748017368  3.602188137  4.087507206
#> [1990,]  1.2558285805  1.695572938  2.506964616
#> [1991,]  0.1071029271  1.293612352  0.851455860
#> [1992,] -0.5059964928 -1.377752120 -1.395562049
#> [1993,] -0.2281291355 -0.323051437 -0.463752401
#> [1994,] -0.0943305197 -0.303530459 -0.286074931
#> [1995,] -0.1970678587  0.276801282 -0.092126478
#> [1996,]  0.4886748154  0.443253971  0.855354923
#> [1997,] -0.3816235340 -1.947837681 -1.556845124
#> [1998,]  0.7852162463  0.934335909  1.497665955
#> [1999,] -0.9676594177 -1.795768004 -2.203227614
#> [2000,] -0.4075844004 -0.741822062 -0.919929620
#>
#> [[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

```
ls()  
#> [1] "i"      "root"   "tex_file"
```

Class

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

References

- Pesigan, I. J. A., & Cheung, S. F. (2023). Monte Carlo confidence intervals for the indirect effect with missing data. *Behavior Research Methods*. <https://doi.org/10.3758/s13428-023-02114-4>
- R Core Team. (2023). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Vienna, Austria. <https://www.R-project.org/>