fitDTVARMx: Internal Tests

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Tests

```
#> test-fitDTVARMx-fit-dt-var-id-mx-psi-diag
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   143.407404986776
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=143.4074 (started at 864.26372)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.759698255386954,0.51293068501254,-0.117571330106502,-0.0083159710380848 3,0.695728660324113,0.4
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   158.954950945854
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=158.95495 (started at 704.47502)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.762881446913649,0.381929224963492,-0.121087879936601,0.005971740759823,0.703854252822966,0.535
#>
#> Means of the estimated paramaters per individual.
#>      beta_11      beta_21      beta_31      beta_12      beta_22      beta_32
#>  0.761289851  0.447429955 -0.119329605 -0.001172115  0.699791457  0.507666249
```

```
#>      beta_13      beta_23      beta_33       psi_11       psi_22       psi_33
#> -0.023737292 -0.030511210  0.427704600  0.091023282  0.109070259  0.087071311
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7596983 0.5129307 -0.1175713 -0.008315971 0.6957287 0.4796895
#> [2,] 0.7628814 0.3819292 -0.1210879  0.005971741 0.7038543 0.5356430
#>          beta_13     beta_23   beta_33     psi_11     psi_22     psi_33
#> [1,] -0.00545524  0.02102876 0.3874918 0.08907097 0.09992115 0.09005935
#> [2,] -0.04201934 -0.08205118 0.4679174 0.09297560 0.11821937 0.08408327
#> Test passed

#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   143.407404986772
#>
#> Solution found

#>
#>  Solution found!   Final fit=143.4074 (started at 155.30127)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.759698244277544,0.512930696767456,-0.11757139938928,-0.00831595469091632,0.695728628998621,0.4
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   158.954950945827
#>
#> Solution found

#>
#>  Solution found!   Final fit=158.95495 (started at 173.82468)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.762881277475544,0.381929289092408,-0.121087909101016,0.00597173839718756,0.703854341041715,0.5

#> Test passed

#> test-fitDTVARMx-fit-dt-var-id-mx-psi-full-alpha
#> Running DTVAR with 21 parameters
#>
#> Beginning initial fit attempt
```

```
#> Running DTVAR with 21 parameters
#>
#>  Lowest minimum so far:   130.860713212673
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=130.86071 (started at 611.92411)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.907007229936191,0.5725967200705 76,-0.182862604928905,-0.100081655724612,0.650075339802413,0.54
#> Running DTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 21 parameters
#>
#>  Lowest minimum so far:   139.32688570416
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=139.32689 (started at 522.26725)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.688944224187242,0.3237090475172 82,-0.115752554598636,-0.0451097560064444,0.705665692048061,0.5
```

```
#>
#> Means of the estimated paramaters per individual.
#>        beta_11        beta_21        beta_31        beta_12        beta_22
#>   7.979757e-01   4.481529e-01  -1.493076e-01  -7.259571e-02   6.778705e-01
#>        beta_32        beta_13        beta_23        beta_33        alpha_1
#>   5.565601e-01  -2.564633e-02  -6.116042e-02   4.168568e-01  -7.032956e-02
#>        alpha_2        alpha_3         psi_11         psi_21         psi_22
#>  -7.478141e-02   3.616966e-02   6.885404e-02  -1.020105e-02   8.737757e-02
#>         psi_31         psi_32         psi_33       theta_11       theta_22
#>  -2.155005e-03  -8.153513e-03   8.302782e-02   1.072575e-02   9.927406e-03
#>       theta_33
#>  2.225074e-308
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31     beta_12   beta_22   beta_32     beta_13
#> [1,] 0.9070072 0.5725967 -0.1828626 -0.10008166 0.6500753 0.5445502  0.05538699
#> [2,] 0.6889442 0.3237090 -0.1157526 -0.04510976 0.7056657 0.5685701 -0.10667965
#>          beta_23   beta_33     alpha_1     alpha_2    alpha_3     psi_11
#> [1,]  0.01068892 0.3643206 -0.02853877 -0.08489982 0.05058161 0.05380210
#> [2,] -0.13300975 0.4693931 -0.11212035 -0.06466300 0.02175772 0.08390599
```

```
#>            psi_21     psi_22       psi_31        psi_32     psi_33    theta_11
#> [1,]  0.003243194 0.07543105  0.001439259  0.0005402401 0.08549315 0.020084579
#> [2,] -0.023645299 0.09932410 -0.005749269 -0.0168472654 0.08056248 0.001366913
#>         theta_22      theta_33
#> [1,] 0.008943096 2.225074e-308
#> [2,] 0.010911715 2.225074e-308
#> Test passed
```

```
#> Running DTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 21 parameters
#>
#>  Lowest minimum so far:   130.860713212637
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=130.86071 (started at 258.45164)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.907007204309977,0.572596987786318,-0.182862254278148,-0.100081604525029,0.650074994301332,0.54
#> Running DTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 21 parameters
#>
#>  Lowest minimum so far:   139.326885704181
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=139.32689 (started at 270.70682)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.688944186887408,0.323709081867955,-0.115752660001728,-0.0451097085798538,0.705665730422289,0.5
#> Test passed
```

```
#> Running DTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 21 parameters
#>
#>  Lowest minimum so far:   130.860713212673
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=130.86071 (started at 611.92411)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.907007229936191,0.5725967200705 76,-0.182862604928905,-0.100081655724612,0.650075339802413,0.54
#> Running DTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 21 parameters
#>
#>  Lowest minimum so far:   139.32688570416
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=139.32689 (started at 522.26725)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.688944224187242,0.3237090475172 82,-0.115752554598636,-0.0451097560064444,0.705665692048061,0.5
#> Running DTVAR with 18 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 18 parameters
#>
#>  Lowest minimum so far:   140.259503017323
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=140.2595 (started at 611.92411)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.842911381533429,0.5168467667895 1,-0.150736217507425,-0.047837265484594,0.720824610700867,0.505
#> Running DTVAR with 18 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 18 parameters
#>
#>  Lowest minimum so far:   151.701621719597
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=151.70162 (started at 522.26725)  (1 attempt(s):  1
valid, 0 errors)
```

```
#>  Start values from best fit:
#> 0.763111965923868,0.369703043085254,-0.130137252464082,0.00643112242385293,0.732546649286381,0.55
#> test-fitDTVARMx-fit-dt-var-id-mx-psi-full
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   141.227445040053
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=141.22745 (started at 864.26372)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.759132597237725,0.5117467240654,-0.117001720448976,-0.00765252376376461,0.696207291827696,0.478
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   152.4278763817 49
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=152.42788 (started at 704.47502)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.763892338563301,0.383013731924256,-0.120352902982372,0.00499878077485043,0.70344260993121,0.535

#>
#> Means of the estimated paramaters per individual.
#>      beta_11      beta_21      beta_31      beta_12      beta_22      beta_32
#>  0.761512468  0.447380228 -0.118677312 -0.001326871  0.699824951  0.507138094
#>      beta_13      beta_23      beta_33       psi_11       psi_21       psi_22
#> -0.023866582 -0.030153805  0.428050275  0.091046873 -0.003051278  0.109030721
#>       psi_31       psi_32       psi_33
#> -0.003780057 -0.008290530  0.087063236
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7591326 0.5117467 -0.1170017 -0.007652524 0.6962073 0.4789361
#> [2,] 0.7638923 0.3830137 -0.1203529  0.004998781 0.7034426 0.5353401
#>          beta_13     beta_23   beta_33     psi_11      psi_21     psi_22
```

```
#> [1,] -0.00573355  0.02068753 0.3880270 0.08903364  0.01356789 0.09988748
#> [2,] -0.04199961 -0.08099514 0.4680735 0.09306011 -0.01967044 0.11817396
#>             psi_31       psi_32     psi_33
#> [1,] -0.0004085943 -0.003218197 0.09006036
#> [2,] -0.0071515206 -0.013362864 0.08406612
#> Test passed
```

```
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   141.227445040052
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=141.22745 (started at 155.30127)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.759132618087095,0.511746732947333,-0.117001718768712,-0.00765252326881371,0.696207294595838,0.
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   152.427876381749
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=152.42788 (started at 173.82468)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.763892345928953,0.383013729597576,-0.120352907158379,0.00499877965420416,0.703442611112905,0.5
#> Test passed
```

```
#> test-fitDTVARMx-fit-dt-var-id-mx-theta-diag
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   141.007091765542
#>
#> Solution found
```

```
#>
#>  Solution found!  Final fit=141.00709 (started at 611.92411)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.874067073976316,0.560970873321944,-0.157379395224968,-0.060316286602635,0.691271352979595,0.501
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:  158.95495094583
#>
#> Solution found
```

```
#>
#>  Solution found!  Final fit=158.95495 (started at 522.26725)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.762881202903151,0.381929333900888,-0.121087935820448,0.0059717522349965,0.703854338321474,0.535
#>
#> Means of the estimated paramaters per individual.
#>       beta_11       beta_21       beta_31       beta_12       beta_22
#>  8.184741e-01  4.714501e-01 -1.392337e-01 -2.717227e-02  6.975628e-01
#>       beta_32       beta_13       beta_23       beta_33        psi_11
#>  5.186768e-01 -2.890123e-03 -3.372155e-02  4.216677e-01  7.556594e-02
#>        psi_22        psi_33      theta_11      theta_22      theta_33
#>  1.031500e-01  8.625905e-02  9.121430e-03  2.428910e-03  1.086906e-15
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.8740671 0.5609709 -0.1573794 -0.060316287 0.6912714 0.5017106
#> [2,] 0.7628812 0.3819293 -0.1210879  0.005971752 0.7038543 0.5356429
#>          beta_13     beta_23   beta_33     psi_11     psi_22    psi_33
#> [1,]  0.03623910  0.01460806 0.3754179 0.05815627 0.08808056 0.0884348
#> [2,] -0.04201934 -0.08205117 0.4679174 0.09297562 0.11821939 0.0840833
#>          theta_11      theta_22     theta_33
#> [1,] 1.824286e-02  4.857820e-03 1.563815e-17
#> [2,] 4.106886e-16 2.225074e-308 2.158173e-15
#> Test passed
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:  141.007091765538
```

```
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=141.00709 (started at 258.45164)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.874067142181008,0.5609708958694,-0.15737939309628,-0.0603162743016983,0.691271362120305,0.5017
#> Running DTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 15 parameters
#>
#>  Lowest minimum so far:   158.954950945828
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=158.95495 (started at 270.70682)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.762881282455708,0.381929306213834,-0.121087899520994,0.00597174192083925,0.703854337192701,0.53

#> Test passed

#> test-fitDTVARMx-fit-dt-var-id-mx-theta-null
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   143.407404986776
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=143.4074 (started at 864.26372)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.759698255386954,0.51293068501254,-0.117571330106502,-0.0083159710380848 3,0.695728660324113,0.47
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   158.954950945854
```

```
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=158.95495 (started at 704.47502)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.762881446913649,0.381929224963492,-0.121087879936601,0.005971740759823,0.703854252822966,0.535
#>
#> Means of the estimated paramaters per individual.
#>      beta_11      beta_21      beta_31      beta_12      beta_22      beta_32
#>  0.761289851  0.447429955 -0.119329605 -0.001172115  0.699791457  0.507666249
#>      beta_13      beta_23      beta_33       psi_11       psi_22       psi_33
#> -0.023737292 -0.030511210  0.427704600  0.091023282  0.109070259  0.087071311
#>
#> Estimated paramaters per individual.
#>        beta_11   beta_21    beta_31      beta_12   beta_22   beta_32
#> [1,] 0.7596983 0.5129307 -0.1175713 -0.008315971 0.6957287 0.4796895
#> [2,] 0.7628814 0.3819292 -0.1210879  0.005971741 0.7038543 0.5356430
#>          beta_13     beta_23   beta_33     psi_11     psi_22     psi_33
#> [1,] -0.00545524  0.02102876 0.3874918 0.08907097 0.09992115 0.09005935
#> [2,] -0.04201934 -0.08205118 0.4679174 0.09297560 0.11821937 0.08408327
#> Test passed
```

```
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   143.407404986772
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=143.4074 (started at 155.30127)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.759698244277544,0.512930696767456,-0.11757139938928,-0.0083159546909163 2,0.695728628998621,0.4
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   158.954950945827
```

```
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=158.95495 (started at 173.82468)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.762881277475544,0.381929289092408,-0.121087909101016,0.00597173839718756,0.703854341041715,0.53
```

```
#> Test passed
```

```
#> test-fitDTVARMx-fit-dt-var-mx-theta-null
#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
#>  Lowest minimum so far:   314.833515756451
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=314.83352 (started at 1681.6314)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.779809576758782,0.456449509059093,-0.149069435059919,-0.0215205293644486,0.709204637901126,0.49
```

```
#> Summary of DTVAR
#>
#> free parameters:
#>       name       matrix  row  col     Estimate   Std.Error A
#> 1  beta_11 DTVAR_1.beta eta1 eta1  0.779809577 0.047072463
#> 2  beta_21 DTVAR_1.beta eta2 eta1  0.456449509 0.054243686
#> 3  beta_31 DTVAR_1.beta eta3 eta1 -0.149069435 0.048836546
#> 4  beta_12 DTVAR_1.beta eta1 eta2 -0.021520529 0.038964011
#> 5  beta_22 DTVAR_1.beta eta2 eta2  0.709204638 0.043964740
#> 6  beta_32 DTVAR_1.beta eta3 eta2  0.493807895 0.040264748
#> 7  beta_13 DTVAR_1.beta eta1 eta3  0.001827002 0.039865722
#> 8  beta_23 DTVAR_1.beta eta2 eta3 -0.027125794 0.044899602
#> 9  beta_33 DTVAR_1.beta eta3 eta3  0.453982960 0.040562888
#> 10  psi_11  DTVAR_1.psi eta1 eta1  0.087188163 0.008810128
#> 11  psi_22  DTVAR_1.psi eta2 eta2  0.111929802 0.011280144
#> 12  psi_33  DTVAR_1.psi eta3 eta3  0.089489071 0.009032654
#>                  lbound ubound
#> 1
#> 2
```

```
#> 3
#> 4
#> 5
#> 6
#> 7
#> 8
#> 9
#> 10 2.2250738585072e-308
#> 11 2.2250738585072e-308
#> 12 2.2250738585072e-308
#>
#> Model Statistics:
#>                |  Parameters  |  Degrees of Freedom  |  Fit (-2lnL units)
#>        Model:             12                   588              314.8335
#>    Saturated:             NA                    NA                    NA
#> Independence:             NA                    NA                    NA
#> Number of observations/statistics: 200/600
#>
#> Information Criteria:
#>       |  df Penalty  |  Parameters Penalty  |  Sample-Size Adjusted
#> AIC:      -861.1665              338.8335                340.5020
#> BIC:     -2800.5771              378.4133                340.3961
#> CFI: NA
#> TLI: 1   (also known as NNFI)
#> RMSEA:  0  [95% CI (NA, NA)]
#> Prob(RMSEA <= 0.05): NA
#> To get additional fit indices, see help(mxRefModels)
#> timestamp: 2024-08-02 02:21:06
#> Wall clock time: 0.9171004 secs
#> optimizer:  SLSQP
#> OpenMx version number: 2.21.11
#> Need help?  See help(mxSummary)
#>
#> Summary of DTVAR
#>
#> free parameters:
#>       name       matrix  row  col     Estimate   Std.Error A
#> 1  beta_11 DTVAR_1.beta eta1 eta1  0.779809577 0.047072463
#> 2  beta_21 DTVAR_1.beta eta2 eta1  0.456449509 0.054243686
#> 3  beta_31 DTVAR_1.beta eta3 eta1 -0.149069435 0.048836546
#> 4  beta_12 DTVAR_1.beta eta1 eta2 -0.021520529 0.038964011
#> 5  beta_22 DTVAR_1.beta eta2 eta2  0.709204638 0.043964740
#> 6  beta_32 DTVAR_1.beta eta3 eta2  0.493807895 0.040264748
#> 7  beta_13 DTVAR_1.beta eta1 eta3  0.001827002 0.039865722
#> 8  beta_23 DTVAR_1.beta eta2 eta3 -0.027125794 0.044899602
#> 9  beta_33 DTVAR_1.beta eta3 eta3  0.453982960 0.040562888
```

```
#> 10  psi_11  DTVAR_1.psi eta1 eta1  0.087188163 0.008810128
#> 11  psi_22  DTVAR_1.psi eta2 eta2  0.111929802 0.011280144
#> 12  psi_33  DTVAR_1.psi eta3 eta3  0.089489071 0.009032654
#>                 lbound ubound
#> 1
#> 2
#> 3
#> 4
#> 5
#> 6
#> 7
#> 8
#> 9
#> 10 2.2250738585072e-308
#> 11 2.2250738585072e-308
#> 12 2.2250738585072e-308
#>
#> Model Statistics:
#>                |  Parameters  |  Degrees of Freedom  |  Fit (-2lnL units)
#>        Model:             12                   588              314.8335
#>    Saturated:             NA                    NA                    NA
#> Independence:             NA                    NA                    NA
#> Number of observations/statistics: 200/600
#>
#> Information Criteria:
#>       |  df Penalty  |  Parameters Penalty  |  Sample-Size Adjusted
#> AIC:      -861.1665              338.8335                340.5020
#> BIC:     -2800.5771              378.4133                340.3961
#> CFI: NA
#> TLI: 1   (also known as NNFI)
#> RMSEA:  0  [95% CI (NA, NA)]
#> Prob(RMSEA <= 0.05): NA
#> To get additional fit indices, see help(mxRefModels)
#> timestamp: 2024-08-02 02:21:06
#> Wall clock time: 0.9171004 secs
#> optimizer:  SLSQP
#> OpenMx version number: 2.21.11
#> Need help?  See help(mxSummary)
#>
#> Test passed

#> Running DTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running DTVAR with 12 parameters
#>
```

```
#>  Lowest minimum so far:   314.833515756454
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=314.83352 (started at 335.05402)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> 0.779809570696339,0.456449524879204,-0.149069418133212,-0.0215205227899933,0.709204639349302,0.4
```

```
#> Test passed
#> [[1]]
#> [[1]][[1]]
#> [[1]][[1]]$value
#> [[1]][[1]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[1]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[2]]
#> [[1]][[2]]$value
#> [[1]][[2]]$value[[1]]
#>
#> Means of the estimated paramaters per individual.
#>        beta_11        beta_21        beta_31        beta_12        beta_22
#>   8.030117e-01   4.432749e-01  -1.404367e-01  -2.070307e-02   7.266856e-01
#>        beta_32        beta_13        beta_23        beta_33         psi_11
#>   5.318426e-01  -8.399299e-03  -4.885233e-02   4.141686e-01   7.988872e-02
#>         psi_21         psi_22         psi_31         psi_32         psi_33
#>  -5.257138e-03   9.229488e-02  -3.910567e-03  -1.136326e-02   8.450496e-02
#>       theta_11       theta_22       theta_33
#>   6.490596e-03   1.013992e-02  2.225074e-308
#>
#>
#> [[1]][[2]]$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]]
#> [1] TRUE
#>
#>
#> [[1]][[5]]$visible
#> [1] TRUE
#>
#>
#> [[1]][[6]]
#> [[1]][[6]]$value
#> [[1]][[6]]$value[[1]]
#> [1] TRUE
#>
#>
#> [[1]][[6]]$visible
#> [1] TRUE
```

Environment

```
ls()

#> [1] "root"
```

Class

```
#> [[1]]
#> [1] "root_criterion"
```

References

R Core Team. (2024). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. Vienna, Austria. https://www.R-project.org/