fitCTVARMx: Internal Tests

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Tests

```
#> test-fitCTVARMx-fit-ct-var-id-mx-sigma-diag
#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#>  Lowest minimum so far:   -524.218555406392
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=-524.21856 (started at -469.9008)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> -0.0384831424067758,0.812800405902159,-0.597594043133311,-0.108906179562877,-5.14321420918298e-1
#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#>  Lowest minimum so far:   -559.970202472839
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=-559.9702 (started at -524.73301)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> -0.642731984798477,1.64491601755663,-0.383427734394026,0.0192872510006784,-1.59866915554968,0.795
#>
#> Means of the estimated paramaters per individual.
#>      phi_11      phi_21      phi_31      phi_12      phi_22      phi_32
#> -0.34060756  1.22885821 -0.49051089 -0.04480946 -0.79933458  0.81415340
```

```
#>       phi_13      phi_23      phi_33   sigma_11   sigma_22   sigma_33
#> -0.02331671 -0.17581839 -0.62344732  0.08711795  0.10984300  0.09716921
#>
#> Estimated paramaters per individual.
#>            phi_11     phi_21      phi_31      phi_12       phi_22    phi_32
#> [1,] -0.03848314 0.8128004 -0.5975940 -0.10890618 -5.143214e-16 0.8330517
#> [2,] -0.64273198 1.6449160 -0.3834277  0.01928725 -1.598669e+00 0.7952551
#>          phi_13     phi_23     phi_33 sigma_11 sigma_22   sigma_33
#> [1,]  0.1211847 -0.4802568 -0.7376982 0.0944874 0.1164533 0.09159277
#> [2,] -0.1678181  0.1286201 -0.5091964 0.0797485 0.1032327 0.10274565
#> Test passed
```

#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#> Lowest minimum so far: -524.218555406389
#>
#> Solution found

#>
#> Solution found!   Final fit=-524.21856 (started at -505.10835) (1 attempt(s):
1 valid, 0 errors)
#> Start values from best fit:
#> -0.0384832832188689,0.812800551902869,-0.59759393437297,-0.10890611181173,-2.03157353899272e-16,(
#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#> Lowest minimum so far: -559.970202472834
#>
#> Solution found

#>
#> Solution found!   Final fit=-559.9702 (started at -549.785) (1 attempt(s): 1
valid, 0 errors)
#> Start values from best fit:
#> -0.642732204901684,1.64491641407151,-0.38342766643758,0.0192872887866774,-1.5986694448406,0.79525

```
#> Test passed
```

#> test-fitCTVARMx-fit-ct-var-id-mx-sigma-full-iota
#> Running CTVAR with 21 parameters
#>
#> Beginning initial fit attempt

```
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -526.372544731396
#>  Not all eigenvalues of the Hessian are positive:  6314789.60275873, 5693381.09289614,
3739654.81122722, 26403.3564978077, 19364.1504338733, 17036.5397459958, 4270.58451397233,
3232.64238000433, 2479.28968518585, 407.206752313115, 328.899294700863, 272.151488803973,
67.3692185513549, 53.9987625480836, 45.1713616772906, 18.9246542702148, 14.8217229004215,
12.3845726920311, 5.87370170630798e-14, -1.19521854347494e-13, -1.45333732398921e-12
#>
#> Beginning fit attempt 1 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  6314789.60275873, 5693381.09289614,
3739654.81122722, 26403.3564978077, 19364.1504338733, 17036.5397459958, 4270.58451397233,
3232.64238000433, 2479.28968518585, 407.206752313115, 328.899294700863, 272.151488803973,
67.3692185513549, 53.9987625480836, 45.1713616772906, 18.9246542702148, 14.8217229004215,
12.3845726920311, 5.87370170630798e-14, -1.19521854347494e-13, -1.45333732398921e-12
#>
#> Beginning fit attempt 2 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 3 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 4 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 5 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 6 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 7 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 8 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 9 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Lowest minimum so far:    -526.372544734482
#>
#> Solution found
```

```
#>
#>   Solution found!    Final fit=-526.37254 (started at 45.578809)   (10 attempt(s):
3 valid, 7 errors)
#>   Start values from best fit:
#> -0.040007797084186,0.834105046843891,-0.579940703044414,-0.109301227500922,2.2250738585072e-308,0
#> Running CTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 21 parameters
#>
#>   Lowest minimum so far:    -561.170532869142
#>   Not all eigenvalues of the Hessian are positive:  8904727.71174432, 4961013.79594336,
3562149.42336946, 25527.2667588878, 21246.0021470078, 19096.2086941644, 5272.37547887387,
3899.89254034723, 2952.42195425253, 88.5170098202636, 76.9342304718128, 66.0220417062671,
34.4766456087406, 29.799029481004, 25.1190393336444, 4.12346493981141, 3.68830542290467,
2.9984654436483, 3.57260834198405e-13, -2.09989919936374e-14, -5.4600392739748e-13
#>
#> Beginning fit attempt 1 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8904727.71174432, 4961013.79594336,
3562149.42336946, 25527.2667588878, 21246.0021470078, 19096.2086941644, 5272.37547887387,
3899.89254034723, 2952.42195425253, 88.5170098202636, 76.9342304718128, 66.0220417062671,
34.4766456087406, 29.799029481004, 25.1190393336444, 4.12346493981141, 3.68830542290467,
2.9984654436483, 3.57260834198405e-13, -2.09989919936374e-14, -5.4600392739748e-13
#>
#> Beginning fit attempt 2 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 3 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 4 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 5 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 6 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 7 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 8 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 9 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 10 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 11 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 12 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 13 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 14 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 15 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 16 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 17 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 18 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt worse than current best:   -561.170465542799 vs -561.170532869142
#>
#> Beginning fit attempt 19 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 20 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 21 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 22 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 23 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 24 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 25 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 26 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 27 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 28 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:    -561.170532869378
#>  Not all eigenvalues of the Hessian are positive:  8904707.5819749, 4961031.39680689,
3562149.57620918, 25527.1856050344, 21246.092483837, 19096.2137348189, 5272.3767215272,
3899.88742074866, 2952.43667037305, 88.5102233069018, 76.9391221913573, 66.0272878982319,
34.4745556984704, 29.801806451567, 25.1167862915731, 4.12168851919296, 3.68484099444673,
2.99626772924758, 3.55386590318202e-12, 9.73957503314256e-14, -1.20017896032524e-12
#>
#> Beginning fit attempt 29 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>  Not all eigenvalues of the Hessian are positive:  8904707.5819749, 4961031.39680689,
#> 3562149.57620918, 25527.1856050344, 21246.092483837, 19096.2137348189, 5272.3767215272,
#> 3899.88742074866, 2952.43667037305, 88.5102233069018, 76.9391221913573, 66.0272878982319,
#> 34.4745556984704, 29.801806451567, 25.1167862915731, 4.12168851919296, 3.68484099444673,
#> 2.99626772924758, 3.55386590318202e-12, 9.73957503314256e-14, -1.20017896032524e-12
#>
#> Beginning fit attempt 30 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 31 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 32 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 33 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 34 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 35 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 36 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 37 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 38 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 39 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 40 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 41 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 42 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 43 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 44 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 45 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 46 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 47 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 48 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 49 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 50 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 51 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 52 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 53 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 54 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 55 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 56 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 57 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 58 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Lowest minimum so far:    -561.170532869878
#>   Not all eigenvalues of the Hessian are positive:  8904711.38263235, 4961049.92817948,
3562140.74147243, 25527.2027599951, 21246.0880030577, 19096.2219977837, 5272.39014232452,
3899.88223672394, 2952.43618061372, 88.5219218860106, 76.9390443117676, 66.0358599513816,
34.4803641542126, 29.7930607609443, 25.1201320405902, 4.12775486319955, 3.68921226148671,
3.00300342314697, 9.12565291777152e-13, 1.44993244992082e-13, -4.7820049072703e-12
#>
#> Beginning fit attempt 59 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Lowest minimum so far:    -561.170532869878
#>   Not all eigenvalues of the Hessian are positive:  8904711.3895506, 4961049.93500836,
3562140.75584497, 25527.2082836993, 21246.0944534053, 19096.2274662561, 5272.39657177171,
3899.89733160889, 2952.43871241637, 88.5257036262155, 76.9443240184877, 66.0404167320737,
34.4868530624362, 29.7900080972884, 25.1237623166436, 4.13309059409189, 3.6971057222297,
3.00638200152387, 1.82731529221384e-12, 1.49668133276785e-13, -6.92960572094683e-13
#>
#> Beginning fit attempt 60 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8904711.3895506, 4961049.93500836,
3562140.75584497, 25527.2082836993, 21246.0944534053, 19096.2274662561, 5272.39657177171,
3899.89733160889, 2952.43871241637, 88.5257036262155, 76.9443240184877, 66.0404167320737,
34.4868530624362, 29.7900080972884, 25.1237623166436, 4.13309059409189, 3.6971057222297,
3.00638200152387, 1.82731529221384e-12, 1.49668133276785e-13, -6.92960572094683e-13
#>
#> Beginning fit attempt 61 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8904729.06923088, 4961067.97612743,
3562115.80571269, 25527.1813352685, 21246.1098991853, 19096.1776108498, 5272.39530811748,
3899.86768442303, 2952.43525829037, 88.5188776522598, 76.9385494985097, 66.0291939526171,
34.4743235521766, 29.7992520222848, 25.118962430566, 4.12539072279081, 3.68516416942833,
2.99821033266062, 2.10575206881018e-13, -6.40312254663145e-14, -4.54778294666505e-12
```

```
#>
#> Beginning fit attempt 62 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 63 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 64 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 65 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 66 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 67 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 68 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 69 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 70 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 71 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 72 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 73 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 74 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904703.34397178, 4961035.35367895,
#> 3562146.06518599, 25527.1725172304, 21246.0947276693, 19096.2116688395, 5272.37576297389,
#> 3899.89027009507, 2952.44308932753, 88.5208403719466, 76.9404057060564, 66.0314478746926,
#> 34.4795970142732, 29.7944802120464, 25.1212905249449, 4.12800257663142, 3.68784659715241,
#> 3.00125361007847, 5.24590149245584e-12, -5.72888167097285e-14, -7.29235735756496e-13
#>
#> Beginning fit attempt 75 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 76 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 77 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 78 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -561.170532870055
#>  Not all eigenvalues of the Hessian are positive:  8904772.14560994, 4961052.38398947,
#> 3562142.94300058, 25527.3094019171, 21246.113311397, 19096.2508069937, 5272.4129259192,
#> 3899.88126013242, 2952.42185790278, 88.5178863980946, 76.9372622505186, 66.0293495366327,
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34.4794918745437, 29.7946720706673, 25.1216141602284, 4.12847362648714, 3.69108200437841,
3.00000957149366, 2.35851432507152e-14, -1.32768698540526e-13, -6.37416688927227e-12
#>
#> Beginning fit attempt 79 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -561.170532870055
#>  Not all eigenvalues of the Hessian are positive:  8904772.14616518, 4961052.38662271,
3562142.94494594, 25527.3096366923, 21246.1166733066, 19096.2510849063, 5272.41116848641,
3899.89126245201, 2952.42089381306, 88.5194185956143, 76.9406263207452, 66.0284168789147,
34.4802797206472, 29.7983779627361, 25.1186703486994, 4.12679839322575, 3.6911511173002,
3.00061009956165, 2.9644042807489e-12, 1.54792221830155e-14, -2.91442373029313e-13
#>
#> Beginning fit attempt 80 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -561.170532870055
#>  Not all eigenvalues of the Hessian are positive:  8904772.1507377, 4961052.395273,
3562142.94545875, 25527.3151910301, 21246.1217017263, 19096.2551043365, 5272.42127353412,
3899.89329463702, 2952.42616885086, 88.5272422266928, 76.9434883401384, 66.0373477562419,
34.4876379628336, 29.7870083247541, 25.122916289089, 4.13483520603299, 3.69652637270513,
3.00491232499902, 7.51680637851935e-13, 4.95993712832099e-14, -5.49343473811848e-12
#>
#> Beginning fit attempt 81 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  OpenMx status code 6 not in list of acceptable status codes, (0,0)
#>
#> Beginning fit attempt 82 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 83 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 84 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 85 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

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#> 
#> Beginning fit attempt 86 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 87 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 88 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 89 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 90 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 91 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 92 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 93 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 94 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904708.83748277, 4961038.02884632,
3562145.41765951, 25527.185086241, 21246.0864582643, 19096.2118390007, 5272.37961456824,
3899.88869984985, 2952.44196095508, 88.5168486781988, 76.9389121685407, 66.0327002812287,
```

```
34.4793525765981, 29.7988240768268, 25.1210676659971, 4.12706203617305, 3.6872997457702,
2.9997980299192, 2.3523028758628e-12, 1.37953226329173e-13, -7.20019614946533e-13
#>
#> Beginning fit attempt 95 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 96 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 97 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 98 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 99 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904707.45877456, 4961031.45696902,
3562144.82472738, 25527.1684503219, 21246.0822732938, 19096.2022805602, 5272.37728578022,
3899.88620643595, 2952.43859775539, 88.5158635842664, 76.9374654377197, 66.0356802283439,
34.4786004989872, 29.7966869254666, 25.1201296139385, 4.12850995758, 3.68790341583993,
2.99939087903081, 1.3091538121531e-13, -6.63916670865779e-15, -4.12455616018369e-13
#>
#> Beginning fit attempt 100 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 101 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904719.92796028, 4961031.11314627,
3562151.70096076, 25527.1984367478, 21246.1023388168, 19096.2157077739, 5272.38054883002,
3899.89024620084, 2952.43580423381, 88.5085069693591, 76.934619753799, 66.0265083442841,
34.4696780588793, 29.8070840567364, 25.1163375075535, 4.11892514694095, 3.67721648298249,
2.99582552741583, 5.56031794378905e-13, -7.17027344013591e-14, -1.87218420095932e-12
#>
#> Beginning fit attempt 102 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 103 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 104 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 105 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 106 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 107 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 108 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 109 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 110 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 111 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

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#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 112 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 113 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 114 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 115 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 116 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 117 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 118 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 119 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 120 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

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#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 121 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 122 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 123 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 124 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 125 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 126 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 127 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 128 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 129 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

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#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 130 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 131 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 132 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 133 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 134 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 135 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 136 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 137 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 138 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 139 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt worse than current best:   -561.170479880259 vs -561.170532870055
#> 
#> Beginning fit attempt 140 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 141 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 142 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 143 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 144 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 145 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 146 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 147 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

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#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 148 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 149 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 150 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 151 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 152 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 153 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904782.49181475, 4961049.230603,
3562083.55709821, 25527.1321810098, 21246.1395895874, 19096.0600595783, 5272.44038789237,
3899.83950363641, 2952.40301412085, 88.5214755028282, 76.9394789465353, 66.029852530241,
34.478072822298, 29.7980745021114, 25.1208735424221, 4.12961604147741, 3.68891643715989,
2.99873910868944, 6.61444335758162e-12, 5.56150422788166e-13, -1.70231949121423e-13
#>
#> Beginning fit attempt 154 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 155 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 156 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 157 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 158 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 159 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 160 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 161 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 162 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 163 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 164 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 165 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 166 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8904711.66413946, 4961029.0626204,
3562146.91039955, 25527.1893200612, 21246.103197946, 19096.2234375816, 5272.38474296713,
3899.89876787876, 2952.44826904603, 88.5159099062238, 76.9441502417482, 66.0352886831645,
34.4832901508852, 29.7923792172383, 25.1217346775561, 4.13402843674988, 3.69219291441674,
3.00356987986975, 8.57509531796476e-13, -5.89886319980744e-14, -1.23353093386813e-13
#>
#> Beginning fit attempt 167 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 168 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 169 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 170 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 171 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 172 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 173 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 174 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 175 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904666.78245191, 4961001.05069455,
3562000.03362879, 25526.9206330987, 21245.8386161409, 19095.9046253658, 5272.33396597156,
3899.79927809655, 2952.41205321819, 88.5145836938588, 76.9421977911079, 66.0360853684747,
34.4812702209015, 29.7932941789748, 25.1205610120713, 4.12626999480931, 3.6890945572059,
3.00238183638276, -1.40735966517504e-14, -1.50536722220659e-12, -4.25565239706073e-12
#>
#> Beginning fit attempt 176 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 177 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 178 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 179 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 180 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 181 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 182 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 183 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 184 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 185 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 186 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 187 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 188 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 189 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 190 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 191 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 192 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 193 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 194 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 195 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 196 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8903301.59499286, 4961227.9943869,
#> 3560927.35478761, 25525.4801287714, 21242.9875857055, 19094.9930032547, 5272.44418182973,
#> 3899.84906100676, 2952.39099591388, 88.5157864198596, 76.9408824535065, 66.0308565368477,
#> 34.4772122115095, 29.7972527350677, 25.1174937389917, 4.12348117715459, 3.68336516959605,
#> 2.99740386082988, 1.85887281153636e-12, -1.23117927549718e-13, -3.6156438175473e-13
#>
#> Beginning fit attempt 197 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 198 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 199 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 200 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 201 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 202 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 203 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 204 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 205 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 206 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 207 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 208 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 209 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 210 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 211 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 212 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 213 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 214 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904704.93582338, 4961031.11637535,
#> 3562157.74278, 25527.1720425177, 21246.0933869608, 19096.2106816042, 5272.37053172795,
#> 3899.88192546417, 2952.42866686419, 88.5122504274988, 76.9311978611273, 66.023912453858,
#> 34.4710805036329, 29.80821444752, 25.1163623687955, 4.11321926238916, 3.68117083161486,
#> 2.99590933479897, 6.7423890556595e-14, -1.74396052724037e-13, -1.5619083703572e-12
#>
#> Beginning fit attempt 215 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 216 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#> 
#> Beginning fit attempt 217 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>   Fit attempt generated errors
#> 
#> Beginning fit attempt 218 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>   Fit attempt generated errors
#> 
#> Beginning fit attempt 219 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>   Fit attempt generated errors
#> 
#> Beginning fit attempt 220 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>   Fit attempt generated errors
#> 
#> Beginning fit attempt 221 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>   Fit attempt generated errors
#> 
#> Beginning fit attempt 222 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>   Fit attempt generated errors
#> 
#> Beginning fit attempt 223 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>   Fit attempt generated errors
#> 
#> Beginning fit attempt 224 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8904703.67777296, 4961027.16475983,
#> 3562141.87078265, 25527.1563540184, 21246.0809123738, 19096.1985172403, 5272.37384269927,
#> 3899.88085163204, 2952.43598174601, 88.5104051858571, 76.9313728880038, 66.0234118599404,
#> 34.4697217717495, 29.8092954798778, 25.115940622728, 4.11711982904209, 3.67942834029906,
#> 2.99492134475427, -1.08260581262698e-13, -4.29390709332932e-13, -2.77897874511561e-12
#> 
#> Beginning fit attempt 225 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 226 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 227 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 228 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 229 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 230 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 231 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 232 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 233 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 234 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 235 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 236 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 237 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 238 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 239 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 240 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 241 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 242 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 243 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 244 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=-561.17053 (started at 13.882653)  (245 attempt(s):
25 valid, 220 errors)
#>  Start values from best fit:
#> -0.677837344332509,1.69866794740805,-0.500859365882407,0.0494997369980171,-1.63285679546434,0.90
#>
#> Means of the estimated paramaters per individual.
#>          phi_11          phi_21          phi_31          phi_12          phi_22
#>  -3.589226e-01   1.266386e+00  -5.404000e-01  -2.990075e-02  -8.164284e-01
#>          phi_32          phi_13          phi_23          phi_33          iota_1
#>   8.701443e-01  -2.922169e-02  -1.617746e-01  -6.303025e-01  -1.182526e-01
#>          iota_2          iota_3         sigma_11        sigma_21        sigma_22
#>   9.386538e-02  -1.979675e-01   8.729672e-02  -4.459798e-03   1.099429e-01
#>        sigma_31        sigma_32        sigma_33        theta_11        theta_22
#>  -5.423760e-04  -8.231733e-03   9.129816e-02   8.621523e-20  2.225074e-308
#>        theta_33
#>   2.973809e-04
#>
#> Estimated paramaters per individual.
#>           phi_11   phi_21     phi_31      phi_12          phi_22     phi_32
#> [1,] -0.0400078 0.834105 -0.5799407 -0.10930123   2.225074e-308 0.8358987
#> [2,] -0.6778373 1.698668 -0.5008594  0.04949974   -1.632857e+00 0.9043899
#>           phi_13     phi_23     phi_33     iota_1     iota_2      iota_3
#> [1,]   0.1267901 -0.4732857 -0.7421004 -0.1252595 0.02815961 -0.46880439
#> [2,]  -0.1852335  0.1497365 -0.5185045 -0.1112456 0.15957116  0.07286935
#>         sigma_11     sigma_21 sigma_22     sigma_31     sigma_32   sigma_33
#> [1,] 0.09452076 -0.006693967 0.1164523 -0.007309287 -0.010580651 0.09164197
#> [2,] 0.08007268 -0.002225629 0.1034335  0.006224535 -0.005882815 0.09095435
#>           theta_11       theta_22       theta_33
#> [1,]   1.724305e-19 2.225074e-308 2.225074e-308
#> [2,] 2.225074e-308 2.225074e-308  5.947617e-04
#> Test passed
```

```
#> Running CTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 21 parameters
```

```
#>
#>   Lowest minimum so far:    -526.372544409076
#>   Not all eigenvalues of the Hessian are positive:  6314334.20758358, 5693771.6783917,
3739361.00547314, 26401.887484776, 19363.5861769263, 17036.0832193859, 4270.745575684,
3232.42303831181, 2479.0256147283, 407.191775343816, 328.905571118046, 272.14985903145,
67.3720557157791, 54.0007981813268, 45.1702050383122, 18.927719718085, 14.8223901072081,
12.3844939608432, 1.56562578283778e-13, 1.41486917585372e-15, -5.48331866518091e-13
#>
#> Beginning fit attempt 1 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Lowest minimum so far:    -526.372544494746
#>   Not all eigenvalues of the Hessian are positive:  6314866.19301808, 5693601.14229096,
3739842.59359216, 26402.9643405257, 19364.6496268936, 17037.1481765861, 4270.5687370149,
3232.78849406289, 2479.30494990862, 407.194779233355, 328.907808152966, 272.160281422571,
67.3787710576501, 54.0068361825545, 45.1795295707558, 18.9284717883015, 14.8315489769019,
12.3964283714654, 2.64349874607619e-13, -3.16749956662832e-14, -8.10184141325293e-14
#>
#> Beginning fit attempt 2 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  6314866.19301808, 5693601.14229096,
3739842.59359216, 26402.9643405257, 19364.6496268936, 17037.1481765861, 4270.5687370149,
3232.78849406289, 2479.30494990862, 407.194779233355, 328.907808152966, 272.160281422571,
67.3787710576501, 54.0068361825545, 45.1795295707558, 18.9284717883015, 14.8315489769019,
12.3964283714654, 2.64349874607619e-13, -3.16749956662832e-14, -8.10184141325293e-14
#>
#> Beginning fit attempt 3 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 4 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 5 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 6 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 7 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 8 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 9 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 10 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 11 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 12 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 13 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 14 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 15 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 16 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 17 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 18 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 19 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -526.372544734306
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=-526.37254 (started at 15.020347)   (20 attempt(s):
4 valid, 16 errors)
#>  Start values from best fit:
#> -0.0400070438197305,0.834106189994629,-0.579941057372798,-0.109301455818781,2.2250738585072e-308,
#> Running CTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -561.170532870872
#>  Not all eigenvalues of the Hessian are positive:  8904708.94991324, 4961123.16161446,
3562106.22106966, 25527.2157293288, 21246.0798991877, 19096.2336825497, 5272.38274185773,
3899.86696428541, 2952.42595995776, 88.5205417429757, 76.9371321501858, 66.031723882957,
34.4770221194641, 29.7992616188146, 25.1178898336969, 4.12556280382147, 3.68573173214618,
2.99983760994957, 1.23315530257183e-12, -1.16636983598841e-13, -3.37247597388357e-13
#>
#> Beginning fit attempt 1 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -561.170532870872
#>
```

```
#> Solution found
```

```
#>
#>   Solution found!    Final fit=-561.17053 (started at -5.5302052)   (2 attempt(s):
2 valid, 0 errors)
#>   Start values from best fit:
#> -0.677837968742847,1.69866597290849,-0.500863740599384,0.0494989953762669,-1.63285863936085,0.90
```

```
#> Test passed
```

```
#> Running CTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 21 parameters
#>
#>   Lowest minimum so far:    -526.372544731396
#>   Not all eigenvalues of the Hessian are positive:  6314789.60275873, 5693381.09289614,
3739654.81122722, 26403.3564978077, 19364.1504338733, 17036.5397459958, 4270.58451397233,
3232.64238000433, 2479.28968518585, 407.206752313115, 328.899294700863, 272.151488803973,
67.3692185513549, 53.9987625480836, 45.1713616772906, 18.9246542702148, 14.8217229004215,
12.3845726920311, 5.87370170630798e-14, -1.19521854347494e-13, -1.45333732398921e-12
#>
#> Beginning fit attempt 1 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  6314789.60275873, 5693381.09289614,
3739654.81122722, 26403.3564978077, 19364.1504338733, 17036.5397459958, 4270.58451397233,
3232.64238000433, 2479.28968518585, 407.206752313115, 328.899294700863, 272.151488803973,
67.3692185513549, 53.9987625480836, 45.1713616772906, 18.9246542702148, 14.8217229004215,
12.3845726920311, 5.87370170630798e-14, -1.19521854347494e-13, -1.45333732398921e-12
#>
#> Beginning fit attempt 2 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 3 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 4 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 5 of at maximum 1000 extra tries
```

```
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 6 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 7 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 8 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 9 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 10 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 11 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 12 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 13 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 14 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 15 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 16 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 17 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 18 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 19 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 20 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 21 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 22 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 23 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 24 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 25 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 26 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 27 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 28 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 29 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 30 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 31 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 32 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 33 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 34 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 35 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 36 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 37 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 38 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 39 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 40 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 41 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 42 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 43 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 44 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 45 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -526.372544734315
#>  Not all eigenvalues of the Hessian are positive:  6314754.14074504, 5693427.09646968,
3739678.08650857, 26403.2137487063, 19364.1986785879, 17036.6286982635, 4270.61521231589,
3232.6664198634, 2479.27621643484, 407.194981392615, 328.908830827445, 272.158406199739,
67.3784724563989, 54.0091077503429, 45.1769011713293, 18.9267659667664, 14.8308162930822,
12.3960137460683, 1.68708869217529e-12, -1.46679927877231e-14, -8.74663097101993e-14
#>
#> Beginning fit attempt 46 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  6314754.14074504, 5693427.09646968,
3739678.08650857, 26403.2137487063, 19364.1986785879, 17036.6286982635, 4270.61521231589,
3232.6664198634, 2479.27621643484, 407.194981392615, 328.908830827445, 272.158406199739,
67.3784724563989, 54.0091077503429, 45.1769011713293, 18.9267659667664, 14.8308162930822,
12.3960137460683, 1.68708869217529e-12, -1.46679927877231e-14, -8.74663097101993e-14
#>
#> Beginning fit attempt 47 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 48 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -526.372544734317
```

```
#>  Not all eigenvalues of the Hessian are positive:  6314767.0345117, 5693429.00997042,
3739668.26995125, 26403.2655809308, 19364.1832694248, 17036.608277582, 4270.60641734096,
3232.65466305577, 2479.28022626205, 407.20389210578, 328.902752734799, 272.154036549201,
67.3737576214115, 53.9993221090157, 45.1683532241534, 18.9275835349854, 14.8203207045604,
12.3876634103756, 2.52342365316324e-12, 6.03025529559585e-13, -4.51362004329008e-14
#>
#> Beginning fit attempt 49 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:   -526.372544734429
#>  Not all eigenvalues of the Hessian are positive:  6314754.17542087, 5693427.12700806,
3739677.43357748, 26403.2197717791, 19364.1883943266, 17036.6298361461, 4270.614568539,
3232.66435152655, 2479.27867159459, 407.192591260259, 328.909324316173, 272.1627056609,
67.3767394619689, 54.0057095129744, 45.1775514203563, 18.9311852029217, 14.8283360434513,
12.3932929462335, 7.18852001896478e-15, -6.47126506769376e-13, -2.23376330867348e-12
#>
#> Beginning fit attempt 50 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  6314754.17542087, 5693427.12700806,
3739677.43357748, 26403.2197717791, 19364.1883943266, 17036.6298361461, 4270.614568539,
3232.66435152655, 2479.27867159459, 407.192591260259, 328.909324316173, 272.1627056609,
67.3767394619689, 54.0057095129744, 45.1775514203563, 18.9311852029217, 14.8283360434513,
12.3932929462335, 7.18852001896478e-15, -6.47126506769376e-13, -2.23376330867348e-12
#>
#> Beginning fit attempt 51 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 52 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 53 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 54 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 55 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 56 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 57 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 58 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 59 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 60 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 61 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 62 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 63 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 64 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 65 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 66 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 67 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 68 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 69 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 70 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 71 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 72 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 73 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

45

```
#>  Not all eigenvalues of the Hessian are positive:  6314656.76507716, 5693336.96126025,
3739656.65236251, 26402.6941180542, 19363.9788865822, 17036.4822540824, 4270.54736251264,
3232.64554015223, 2479.23761162346, 407.195320589294, 328.903691216569, 272.161417395018,
67.3756387025902, 54.0053106047359, 45.1789465453362, 18.9312730874995, 14.8264320373759,
12.3976413225186, 2.00416534192973e-12, -2.21520290618191e-14, -6.65954940261317e-13
#>
#> Beginning fit attempt 74 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 75 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 76 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 77 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 78 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 79 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 80 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 81 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 82 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 83 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 84 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 85 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 86 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 87 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 88 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 89 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 90 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 91 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 92 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 93 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 94 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 95 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 96 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 97 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 98 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 99 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#> 
#> Beginning fit attempt 100 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 101 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 102 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 103 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 104 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 105 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 106 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 107 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 108 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
```

```
#> 
#> Beginning fit attempt 109 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 110 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 111 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 112 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 113 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 114 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 115 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 116 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
#> 
#> Beginning fit attempt 117 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#> 
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 118 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 119 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 120 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#> Solution found
```

```
#>
#>   Solution found!   Final fit=-526.37254 (started at 45.578809)   (121 attempt(s):
9 valid, 112 errors)
#>   Start values from best fit:
#> -0.0399899566044828,0.834106389703618,-0.579926364291964,-0.109309065385318,-5.6606135510273e-09,
#> Running CTVAR with 21 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 21 parameters
#>
#>   Lowest minimum so far:    -561.170532869142
#>   Not all eigenvalues of the Hessian are positive:  8904727.71174432, 4961013.79594336,
3562149.42336946, 25527.2667588878, 21246.0021470078, 19096.2086941644, 5272.37547887387,
3899.89254034723, 2952.42195425253, 88.5170098202636, 76.9342304718128, 66.0220417062671,
34.4766456087406, 29.799029481004, 25.1190393336444, 4.12346493981141, 3.68830542290467,
2.9984654436483, 3.57260834198405e-13, -2.09989919936374e-14, -5.4600392739748e-13
#>
#> Beginning fit attempt 1 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8904727.71174432, 4961013.79594336,
3562149.42336946, 25527.2667588878, 21246.0021470078, 19096.2086941644, 5272.37547887387,
3899.89254034723, 2952.42195425253, 88.5170098202636, 76.9342304718128, 66.0220417062671,
34.4766456087406, 29.799029481004, 25.1190393336444, 4.12346493981141, 3.68830542290467,
2.9984654436483, 3.57260834198405e-13, -2.09989919936374e-14, -5.4600392739748e-13
#>
#> Beginning fit attempt 2 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 3 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 4 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 5 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 6 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 7 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 8 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 9 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 10 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 11 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 12 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 13 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 14 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 15 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 16 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 17 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 18 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 19 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 20 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 21 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 22 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 23 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 24 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 25 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8905592.20429762, 4961059.20602127,
3561607.93628491, 25525.493720913, 21246.7686738913, 19094.328182963, 5272.21597794359,
3899.54874649971, 2952.42350386978, 88.5217086972185, 76.9381783658948, 66.0367215803786,
34.4787999295203, 29.798433426923, 25.1197943141707, 4.12351431519519, 3.68770293847235,
2.99988632210167, 1.43116370012388e-12, 9.06039707457734e-14, -5.62240112795789e-13
#>
#> Beginning fit attempt 26 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 27 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Lowest minimum so far:    -561.170532869821
#>  Not all eigenvalues of the Hessian are positive:  8904692.44764829, 4961049.7797885,
3562167.66849037, 25527.1483668025, 21246.1078808492, 19096.2191938452, 5272.37548836491,
3899.89729478613, 2952.43438981725, 88.5202690512679, 76.9397850474311, 66.0386791863991,
34.4824191000377, 29.7914444903159, 25.120878505453, 4.1293731813818, 3.69283281580635,
3.00163314056853, 3.91559080001698e-13, -1.40852209571949e-13, -1.24855106440418e-12
#>
#> Beginning fit attempt 28 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>  Not all eigenvalues of the Hessian are positive:  8904692.44764829, 4961049.7797885,
3562167.66849037, 25527.1483668025, 21246.1078808492, 19096.2191938452, 5272.37548836491,
3899.89729478613, 2952.43438981725, 88.5202690512679, 76.9397850474311, 66.0386791863991,
34.4824191000377, 29.7914444903159, 25.120878505453, 4.1293731813818, 3.69283281580635,
3.00163314056853, 3.91559080001698e-13, -1.40852209571949e-13, -1.24855106440418e-12
#>
#> Beginning fit attempt 29 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 30 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 31 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 32 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 33 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 34 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 35 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 36 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904678.06381004, 4961041.49168464,
3562158.82418757, 25527.1638561643, 21246.07324847, 19096.239659553, 5272.36778882627,
3899.90708720271, 2952.44344624906, 88.5214755091016, 76.9412888098828, 66.0315126365627,
```

```
#> 34.4829876110772, 29.7958107706667, 25.1219380521959, 4.13122206395888, 3.69331613624483,
#> 3.00153352961432, -1.05386377321219e-13, -6.11584207286183e-13, -1.34811209327629e-12
#>
#> Beginning fit attempt 37 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 38 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904703.83237422, 4961033.75060099,
#> 3562150.58956484, 25527.1816426652, 21246.0924691856, 19096.2248618416, 5272.37407281001,
#> 3899.89423927254, 2952.43830344765, 88.5095067787801, 76.9385302542865, 66.0238820268815,
#> 34.4764337881384, 29.8045661292121, 25.1187574019333, 4.12259413520283, 3.68624630621441,
#> 2.99868915512974, 1.54925838250965e-12, 4.21723259816619e-14, -2.4526736515489e-14
#>
#> Beginning fit attempt 39 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 40 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 41 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 42 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 43 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 44 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 45 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 46 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 47 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 48 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 49 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 50 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 51 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 52 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 53 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 54 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 55 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Lowest minimum so far:    -561.170532870395
#>   Not all eigenvalues of the Hessian are positive:  8904719.40942091, 4961038.36949493,
3562118.73276146, 25527.186252825, 21245.9989641382, 19096.1504085257, 5272.40069757708,
3899.87186413854, 2952.39764362338, 88.5214208532688, 76.9432493274549, 66.0372666047573,
34.4847405313865, 29.7898607015087, 25.1238895003896, 4.13047678533774, 3.69500732467976,
3.00254377264967, 1.52858954896678e-13, -9.3348283677651e-13, -2.57660919343385e-12
#>
#> Beginning fit attempt 56 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Lowest minimum so far:    -561.170532871309
#>   Not all eigenvalues of the Hessian are positive:  8904720.41602819, 4961104.77710484,
3562118.36953452, 25527.2160592762, 21246.0764101045, 19096.1998770647, 5272.39560336686,
3899.8716746767, 2952.40738892444, 88.5210823025163, 76.9410969205064, 66.0366140578558,
34.4788905531671, 29.7966425335028, 25.1215883990598, 4.12824636777727, 3.68870818594143,
3.00156542749243, 2.15678719857495e-12, -7.95129250906779e-14, -8.63242041467581e-13
#>
#> Beginning fit attempt 57 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8904720.41602819, 4961104.77710484,
3562118.36953452, 25527.2160592762, 21246.0764101045, 19096.1998770647, 5272.39560336686,
3899.8716746767, 2952.40738892444, 88.5210823025163, 76.9410969205064, 66.0366140578558,
34.4788905531671, 29.7966425335028, 25.1215883990598, 4.12824636777727, 3.68870818594143,
3.00156542749243, 2.15678719857495e-12, -7.95129250906779e-14, -8.63242041467581e-13
#>
#> Beginning fit attempt 58 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8904668.80466361, 4961047.02175727,
3562164.80504197, 25527.1846632951, 21246.0811209042, 19096.27337998, 5272.35710067197,
3899.90313104247, 2952.44268439267, 88.5164057312705, 76.9358712674051, 66.0280086684276,
34.4730514441705, 29.8046682055142, 25.1158735537645, 4.12473835891012, 3.68270285332434,
2.99751895249772, -1.02739888504532e-14, -3.7511254685186e-14, -8.46206290497005e-13
#>
#> Beginning fit attempt 59 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 60 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 61 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 62 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 63 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 64 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 65 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 66 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 67 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 68 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 69 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904709.33804525, 4961032.57419865,
3562119.50565232, 25527.1280571669, 21246.0827097854, 19096.1659298863, 5272.38588070343,
3899.87779209324, 2952.44041364398, 88.5155636049652, 76.9404571994398, 66.029934959055,
34.4795378551509, 29.7963607444697, 25.1198536908108, 4.12674844516687, 3.68956320240465,
2.99941642513461, 4.79841615850608e-12, 2.02798529832233e-13, -2.71558885572136e-13
#>
#> Beginning fit attempt 70 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 71 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 72 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>  Not all eigenvalues of the Hessian are positive:  8904799.53440208, 4961014.97517026,
3561959.34774734, 25526.8720478686, 21245.8810147606, 19095.7852015089, 5272.45568755663,
3899.71045057961, 2952.1937615542, 88.5189040611283, 76.9387920837483, 66.0275711233557,
34.4811095456922, 29.7940459949078, 25.1223300714269, 4.12999427363617, 3.69259331431507,
3.00114253775388, 7.47165521227993e-14, -2.52553784634875e-14, -7.9804556843874e-12
#>
#> Beginning fit attempt 73 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 74 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 75 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 76 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 77 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 78 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 79 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 80 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 81 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 82 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 83 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 84 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt worse than current best:   -213.762114564809 vs -561.170532871309
#>
#> Beginning fit attempt 85 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 86 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 87 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 88 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 89 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 90 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 91 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 92 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 93 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 94 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 95 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 96 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 97 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 98 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 99 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 100 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 101 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 102 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 103 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
```

```
#>
#> Beginning fit attempt 104 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 105 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 106 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 107 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 108 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 109 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 110 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 111 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>   Fit attempt generated errors
#>
#> Beginning fit attempt 112 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>   Not all eigenvalues of the Hessian are positive:  8904708.61446888, 4961030.85654121,
3562145.21008102, 25527.1793995645, 21246.0872030446, 19096.2147208996, 5272.37324089021,
3899.88315866885, 2952.43875212315, 88.5192148224145, 76.9349663493629, 66.0306965866184,
```

```
34.4743951435713, 29.7978276850886, 25.1191108396647, 4.12754691396079, 3.68850695532402,
2.99775155269267, 2.75438332724552e-13, 7.03268927801615e-15, -4.61247470856936e-12
#>
#> Beginning fit attempt 113 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 114 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 115 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 116 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 117 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 118 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 119 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 120 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 121 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 122 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 123 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 124 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 125 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 126 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 127 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 128 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 129 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 130 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
```

```
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 131 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 132 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 133 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#>  Fit attempt generated errors
#>
#> Beginning fit attempt 134 of at maximum 1000 extra tries
#> Running CTVAR with 21 parameters
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=-561.17053 (started at 13.882653)  (135 attempt(s):
16 valid, 119 errors)
#>  Start values from best fit:
#> -0.677856006592507,1.69870394443832,-0.501082174219981,0.0493918966031866,-1.63277805601923,0.90.
#> test-fitCTVARMx-fit-ct-var-id-mx-sigma-full
#> Running CTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 15 parameters
#>
#>  Lowest minimum so far:   -526.37254473443
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=-526.37254 (started at -469.9008)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> -0.0400076924431331,0.834105474722726,-0.579941168825472,-0.109301141188417,2.2250738585072e-308,
#> Running CTVAR with 15 parameters
#>
```

```
#> Beginning initial fit attempt
#> Running CTVAR with 15 parameters
#>
#>  Lowest minimum so far:    -560.908732339046
#>
#> Solution found


#>
#>  Solution found!   Final fit=-560.90873 (started at -524.73301)  (1 attempt(s):
1 valid, 0 errors)
#>  Start values from best fit:
#> -0.666851281700055,1.70449639871362,-0.562532442949386,0.0424175071771889,-1.63676296621656,0.955
#>
#> Means of the estimated paramaters per individual.
#>       phi_11          phi_21          phi_31          phi_12          phi_22
#> -0.3534294871  1.2693009367 -0.5712368059 -0.0334418170 -0.8183814831
#>       phi_32          phi_13          phi_23          phi_33        sigma_11
#>  0.8956494175 -0.0257088810 -0.1599705062 -0.6471484142  0.0872560190
#>     sigma_21        sigma_22        sigma_31        sigma_32        sigma_33
#> -0.0044724472  0.1100599358 -0.0009240652 -0.0096000289  0.0973692748
#>
#> Estimated paramaters per individual.
#>          phi_11    phi_21    phi_31    phi_12        phi_22    phi_32
#> [1,] -0.04000769 0.8341055 -0.5799412 -0.10930114  2.225074e-308 0.8358991
#> [2,] -0.66685128 1.7044964 -0.5625324  0.04241751  -1.636763e+00 0.9553997
#>          phi_13    phi_23    phi_33  sigma_11      sigma_21 sigma_22
#> [1,]  0.1267900 -0.473286 -0.7421010 0.09452072 -0.006693963 0.1164523
#> [2,] -0.1782078  0.153345 -0.5521958 0.07999132 -0.002250932 0.1036676
#>          sigma_31      sigma_32    sigma_33
#> [1,] -0.007309297 -0.010580650 0.09164205
#> [2,]  0.005461166 -0.008619408 0.10309650
#> Test passed

#> Running CTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 15 parameters
#>
#>  Lowest minimum so far:    -526.372544734471
#>
#> Solution found


#>
#>  Solution found!   Final fit=-526.37254 (started at -505.10835)  (1 attempt(s):
1 valid, 0 errors)
```

```
#>  Start values from best fit:
#> -0.0400075759949649,0.834105227444661,-0.579941056579078,-0.109301334267454,2.2250738585072e-308,
#> Running CTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 15 parameters
#>
#>  Lowest minimum so far:    -560.908732339043
#>
#> Solution found
```

```
#>
#>  Solution found!    Final fit=-560.90873 (started at -549.785)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> -0.666851435172451,1.70449661971283,-0.562532590288391,0.0424176092148328,-1.63676291433942,0.955
```

#> Test passed

```
#> test-fitCTVARMx-fit-ct-var-id-mx-theta-diag
#> Running CTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 15 parameters
#>
#>  Lowest minimum so far:    -524.36743585852
#>
#> Solution found
```

```
#>
#>  Solution found!    Final fit=-524.36744 (started at 45.578809)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> -0.0392196975057307,0.813122906567035,-0.593693014739551,-0.108212382263372,2.2250738585072e-308,
#> Running CTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 15 parameters
#>
#>  Lowest minimum so far:    -560.449739070489
#>
#> Solution found
```

```
#>
#>  Solution found!    Final fit=-560.44974 (started at 13.882653)  (1 attempt(s):  1
valid, 0 errors)
```

```
#> Start values from best fit:
#> -0.648628550992624,1.64581841929377,-0.343004038798861,0.0227999759180989,-1.59863975713676,0.775
#>
#> Means of the estimated paramaters per individual.
#>        phi_11       phi_21       phi_31       phi_12       phi_22
#> -3.439241e-01  1.229471e+00 -4.683485e-01 -4.270620e-02 -7.993199e-01
#>        phi_32       phi_13       phi_23       phi_33      sigma_11
#>  8.006183e-01 -2.583282e-02 -1.754315e-01 -6.022583e-01  8.718153e-02
#>      sigma_22      sigma_33      theta_11      theta_22      theta_33
#>  1.095926e-01  8.606131e-02  2.009293e-22  8.199484e-22  5.542973e-04
#>
#> Estimated paramaters per individual.
#>          phi_11    phi_21    phi_31     phi_12       phi_22    phi_32
#> [1,] -0.0392197 0.8131229 -0.593693 -0.10821238  2.225074e-308 0.8257233
#> [2,] -0.6486286 1.6458184 -0.343004  0.02279998 -1.598640e+00 0.7755134
#>          phi_13    phi_23     phi_33   sigma_11 sigma_22   sigma_33
#> [1,]  0.1202468 -0.4802755 -0.7267471 0.09460248 0.1161697 0.08341591
#> [2,] -0.1719124  0.1294124 -0.4777695 0.07976059 0.1030156 0.08870670
#>            theta_11      theta_22      theta_33
#> [1,] 2.225074e-308 2.225074e-308 0.0004114894
#> [2,]  4.018587e-22  1.639897e-21 0.0006971052
#> Test passed

#> Running CTVAR with 15 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 15 parameters
#>
#>  Lowest minimum so far:    -524.367377199729
#>  OpenMx status code 6 not in list of acceptable status codes, (0,0)
#>
#> Beginning fit attempt 1 of at maximum 1000 extra tries
#> Running CTVAR with 15 parameters
#>
#>  Lowest minimum so far:    -524.36743580039
#>
#> Solution found


#>
#>  Solution found!   Final fit=-524.36744 (started at 15.020347)  (2 attempt(s):  2
valid, 0 errors)
#>  Start values from best fit:
#> -0.0393397150430666,0.812970450231768,-0.593461310428315,-0.108173421191402,-2.79389813490541e-20
#> Running CTVAR with 15 parameters
#>
```

```
#> Beginning initial fit attempt
#> Running CTVAR with 15 parameters
#>
#>  Lowest minimum so far:   -560.449739069956
#>
#> Solution found


#>
#>  Solution found!   Final fit=-560.44974 (started at -5.5302052)  (1 attempt(s):
1 valid, 0 errors)
#>  Start values from best fit:
#> -0.648629129517774,1.64581981809714,-0.343001328371216,0.0228004211424888,-1.59864140686751,0.7755

#> Test passed

#> test-fitCTVARMx-fit-ct-var-id-mx-theta-null
#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#>  Lowest minimum so far:   -524.218555406392
#>
#> Solution found


#>
#>  Solution found!   Final fit=-524.21856 (started at -469.9008)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> -0.0384831424067758,0.812800405902159,-0.597594043133311,-0.108906179562877,-5.14321420918298e-16
#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#>  Lowest minimum so far:   -559.970202472839
#>
#> Solution found


#>
#>  Solution found!   Final fit=-559.9702 (started at -524.73301)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> -0.642731984798477,1.64491601755663,-0.383427734394026,0.0192872510006784,-1.59866915554968,0.795

#>
```

```
#> Means of the estimated paramaters per individual.
#>      phi_11       phi_21       phi_31       phi_12       phi_22       phi_32
#> -0.34060756  1.22885821 -0.49051089 -0.04480946 -0.79933458  0.81415340
#>      phi_13       phi_23       phi_33    sigma_11    sigma_22    sigma_33
#> -0.02331671 -0.17581839 -0.62344732  0.08711795  0.10984300  0.09716921
#>
#> Estimated paramaters per individual.
#>            phi_11     phi_21     phi_31      phi_12        phi_22    phi_32
#> [1,] -0.03848314 0.8128004 -0.5975940 -0.10890618 -5.143214e-16 0.8330517
#> [2,] -0.64273198 1.6449160 -0.3834277  0.01928725 -1.598669e+00 0.7952551
#>          phi_13     phi_23     phi_33 sigma_11 sigma_22   sigma_33
#> [1,]  0.1211847 -0.4802568 -0.7376982 0.0944874 0.1164533 0.09159277
#> [2,] -0.1678181  0.1286201 -0.5091964 0.0797485 0.1032327 0.10274565
#> Test passed
```

#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#> Lowest minimum so far: -524.218555406389
#>
#> Solution found

#>
#> Solution found!   Final fit=-524.21856 (started at -505.10835)   (1 attempt(s):
1 valid, 0 errors)
#> Start values from best fit:
#> -0.0384832832188689,0.812800551902869,-0.59759393437297,-0.10890611181173,-2.03157353899272e-16,0
#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#> Lowest minimum so far: -559.970202472834
#>
#> Solution found

#>
#> Solution found!   Final fit=-559.9702 (started at -549.785)   (1 attempt(s): 1
valid, 0 errors)
#> Start values from best fit:
#> -0.642732204901684,1.64491641407151,-0.38342766643758,0.01928728878667774,-1.5986694448406,0.79525

```
#> Test passed
```

#> test-fitCTVARMx-fit-ct-var-mx-theta-null

```
#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#>  Lowest minimum so far:   -1157.20358246445
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=-1157.2036 (started at -1076.798)  (1 attempt(s):  1
valid, 0 errors)
#>  Start values from best fit:
#> -0.0502683127453872,0.6604328106315,-0.81642594205769,-0.214239295434563,-0.300531581970456,0.786
#> Summary of CTVAR
#>
#> free parameters:
#>        name         matrix  row   col     Estimate    Std.Error A
#> 1    phi_11   CTVAR_1.phi eta1 eta1 -0.05026831 0.205134398
#> 2    phi_21   CTVAR_1.phi eta2 eta1  0.66043281 0.214949378
#> 3    phi_31   CTVAR_1.phi eta3 eta1 -0.81642594 0.208145903
#> 4    phi_12   CTVAR_1.phi eta1 eta2 -0.21423930 0.146527401
#> 5    phi_22   CTVAR_1.phi eta2 eta2 -0.30053158 0.155595184
#> 6    phi_32   CTVAR_1.phi eta3 eta2  0.78652341 0.149942926
#> 7    phi_13   CTVAR_1.phi eta1 eta3  0.27755137 0.103990691
#> 8    phi_23   CTVAR_1.phi eta2 eta3 -0.05509869 0.110111373
#> 9    phi_33   CTVAR_1.phi eta3 eta3 -0.62168583 0.106649524
#> 10 sigma_11 CTVAR_1.sigma eta1 eta1  0.07883831 0.008094810
#> 11 sigma_22 CTVAR_1.sigma eta2 eta2  0.08894839 0.009038868
#> 12 sigma_33 CTVAR_1.sigma eta3 eta3  0.08332776 0.008417876
#>                lbound                ubound
#> 1                       2.2250738585072e-308
#> 2
#> 3
#> 4
#> 5                       2.2250738585072e-308
#> 6
#> 7
#> 8
#> 9                       2.2250738585072e-308
#> 10 2.2250738585072e-308
#> 11 2.2250738585072e-308
#> 12 2.2250738585072e-308
#>
#> Model Statistics:
```

```
#>                 | Parameters | Degrees of Freedom |  Fit (-2lnL units)
#>        Model:         12              588               -1157.204
#>    Saturated:         NA              NA                      NA
#> Independence:         NA              NA                      NA
#> Number of observations/statistics: 200/600
#>
#> Information Criteria:
#>       | df Penalty | Parameters Penalty |  Sample-Size Adjusted
#> AIC:     -2333.204             -1133.204              -1131.535
#> BIC:     -4272.614             -1093.624              -1131.641
#> 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: 2024-07-26 04:08:10
#> Wall clock time: 1.764555 secs
#> optimizer:  SLSQP
#> OpenMx version number: 2.21.11
#> Need help?  See help(mxSummary)
#>
#> Summary of CTVAR
#>
#> free parameters:
#>         name        matrix  row   col    Estimate    Std.Error A
#> 1    phi_11   CTVAR_1.phi eta1 eta1 -0.05026831 0.205134398
#> 2    phi_21   CTVAR_1.phi eta2 eta1  0.66043281 0.214949378
#> 3    phi_31   CTVAR_1.phi eta3 eta1 -0.81642594 0.208145903
#> 4    phi_12   CTVAR_1.phi eta1 eta2 -0.21423930 0.146527401
#> 5    phi_22   CTVAR_1.phi eta2 eta2 -0.30053158 0.155595184
#> 6    phi_32   CTVAR_1.phi eta3 eta2  0.78652341 0.149942926
#> 7    phi_13   CTVAR_1.phi eta1 eta3  0.27755137 0.103990691
#> 8    phi_23   CTVAR_1.phi eta2 eta3 -0.05509869 0.110111373
#> 9    phi_33   CTVAR_1.phi eta3 eta3 -0.62168583 0.106649524
#> 10 sigma_11 CTVAR_1.sigma eta1 eta1  0.07883831 0.008094810
#> 11 sigma_22 CTVAR_1.sigma eta2 eta2  0.08894839 0.009038868
#> 12 sigma_33 CTVAR_1.sigma eta3 eta3  0.08332776 0.008417876
#>                 lbound                 ubound
#> 1                    2.2250738585072e-308
#> 2
#> 3
#> 4
#> 5                    2.2250738585072e-308
#> 6
#> 7
```

```
#> 8
#> 9                        2.2250738585072e-308
#> 10 2.2250738585072e-308
#> 11 2.2250738585072e-308
#> 12 2.2250738585072e-308
#>
#> Model Statistics:
#>                | Parameters | Degrees of Freedom | Fit (-2lnL units)
#>        Model:           12                  588            -1157.204
#>    Saturated:           NA                   NA                   NA
#> Independence:           NA                   NA                   NA
#> Number of observations/statistics: 200/600
#>
#> Information Criteria:
#>        | df Penalty | Parameters Penalty | Sample-Size Adjusted
#> AIC:      -2333.204              -1133.204              -1131.535
#> BIC:      -4272.614              -1093.624              -1131.641
#> 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: 2024-07-26 04:08:10
#> Wall clock time: 1.764555 secs
#> optimizer:  SLSQP
#> OpenMx version number: 2.21.11
#> Need help?  See help(mxSummary)
#>
#> Test passed

#> Running CTVAR with 12 parameters
#>
#> Beginning initial fit attempt
#> Running CTVAR with 12 parameters
#>
#>  Lowest minimum so far:   -1157.20358246445
#>
#> Solution found
```

```
#>
#>  Solution found!   Final fit=-1157.2036 (started at -1137.6365)  (1 attempt(s):
1 valid, 0 errors)
#>  Start values from best fit:
#> -0.0502683086451685,0.660432815170226,-0.816425944066296,-0.214239324052436,-0.300531589633301,0.
```

```
#> 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]]$value[[1]]
#>
#> Means of the estimated paramaters per individual.
#>         phi_11          phi_21          phi_31          phi_12          phi_22
#>  -3.589230e-01   1.266405e+00  -5.405043e-01  -2.995858e-02  -8.163890e-01
#>         phi_32          phi_13          phi_23          phi_33          iota_1
#>   8.702473e-01  -2.916740e-02  -1.617898e-01  -6.303221e-01  -2.961929e-01
#>         iota_2          iota_3        sigma_11        sigma_21        sigma_22
#>   4.566428e-02   2.669216e-01   8.729554e-02  -4.460988e-03   1.099427e-01
#>       sigma_31        sigma_32        sigma_33        theta_11        theta_22
#>  -5.420592e-04  -8.233410e-03   9.129868e-02  2.225074e-308  2.225074e-308
#>       theta_33
#>   2.973374e-04
#>
#>
#> [[1]][[2]]$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/