`netcopula` package

Report at 2016-04-20‘

Sergio Venturini

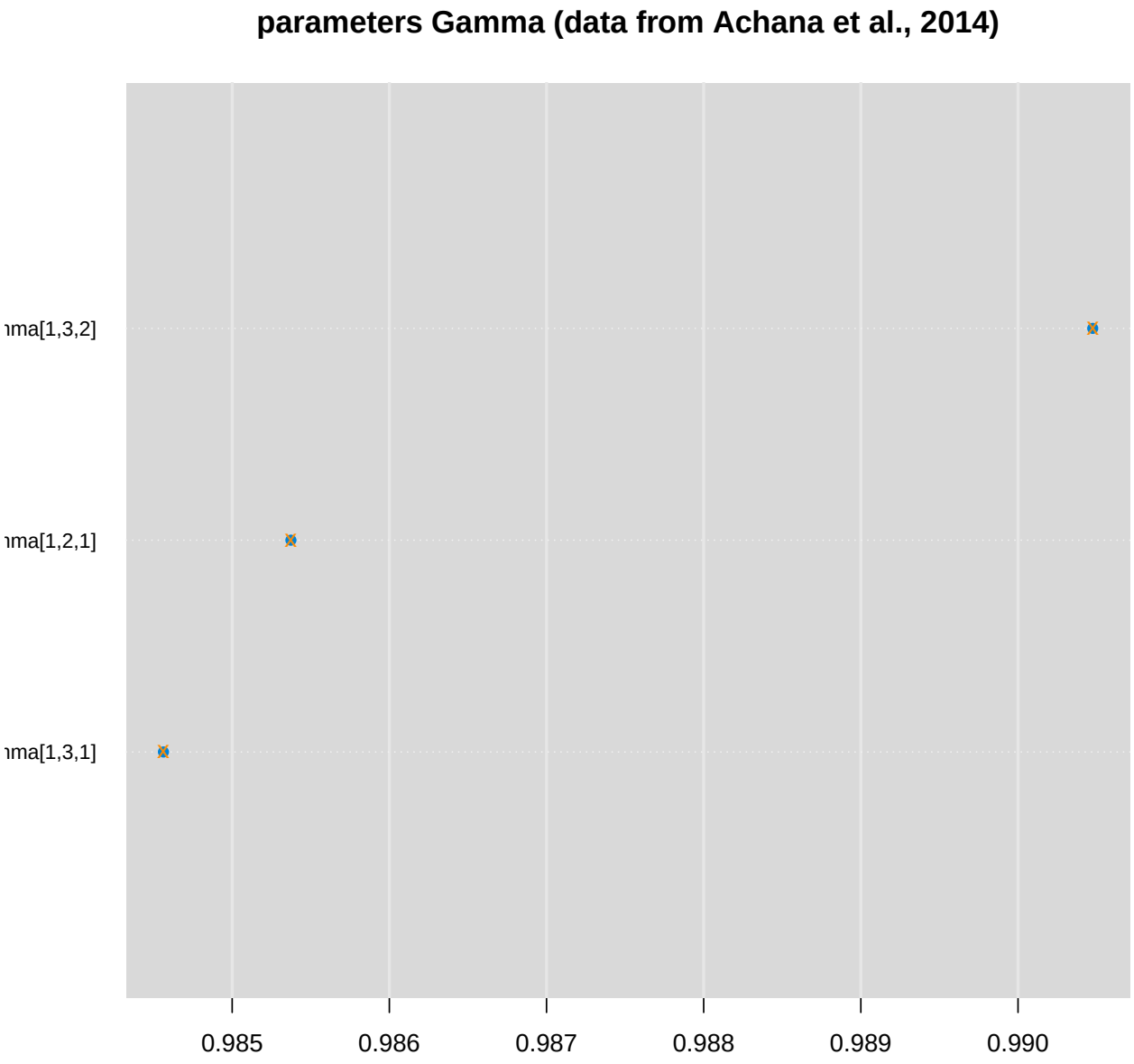
$\boldsymbol{\Gamma}$ fixed – $\boldsymbol{\mu}$ and $\boldsymbol{\delta}$ unconstrained

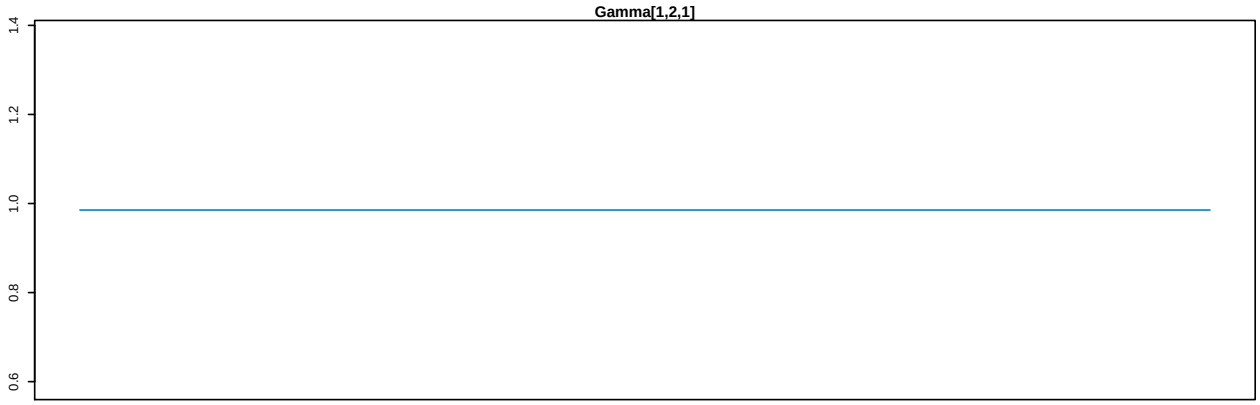
In this section we fix the $\boldsymbol{\Gamma}$ parameters to their sample estimates, that is

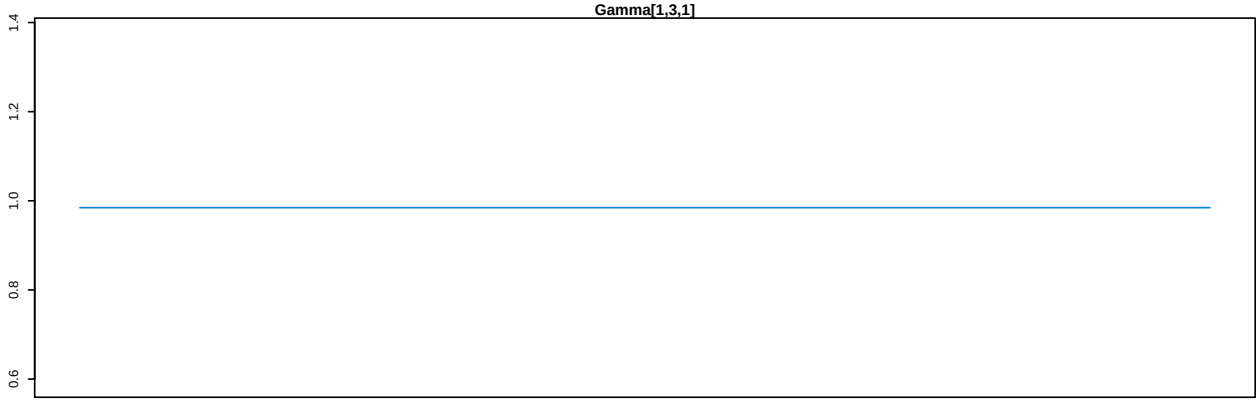
```
##           y1        y2        y3
## y1 1.0000000 0.9853737 0.9845625
## y2 0.9853737 1.0000000 0.9904754
## y3 0.9845625 0.9904754 1.0000000
```

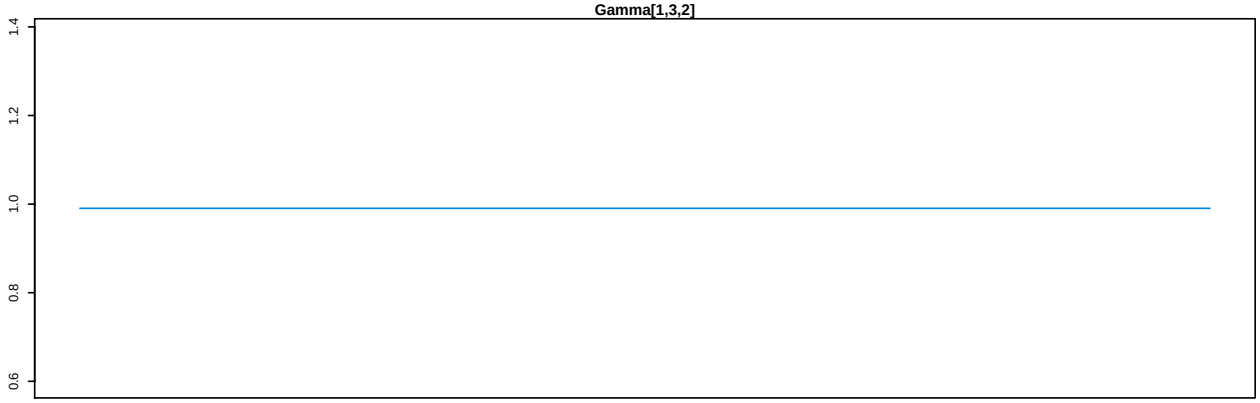
and leave the $\boldsymbol{\mu}$ and $\boldsymbol{\delta}$ parameters unconstrained (i.e. at each iteration we do not impose the restriction that μ_{ikm} is fixed for all the arms of the same study and that δ_{ikm} is 0 for all arms different from the baseline).

Γ (outcome copula correlation matrix)

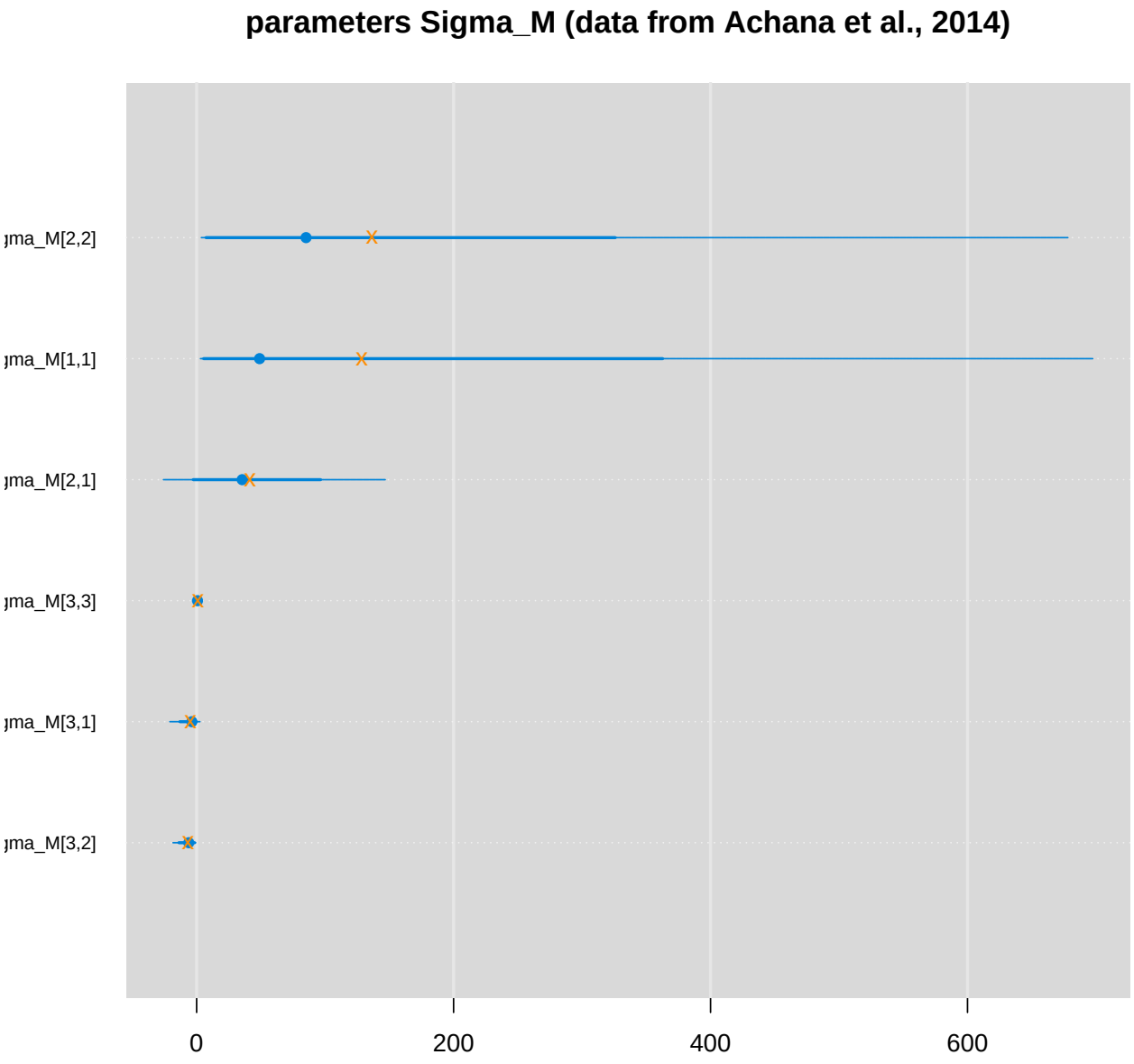


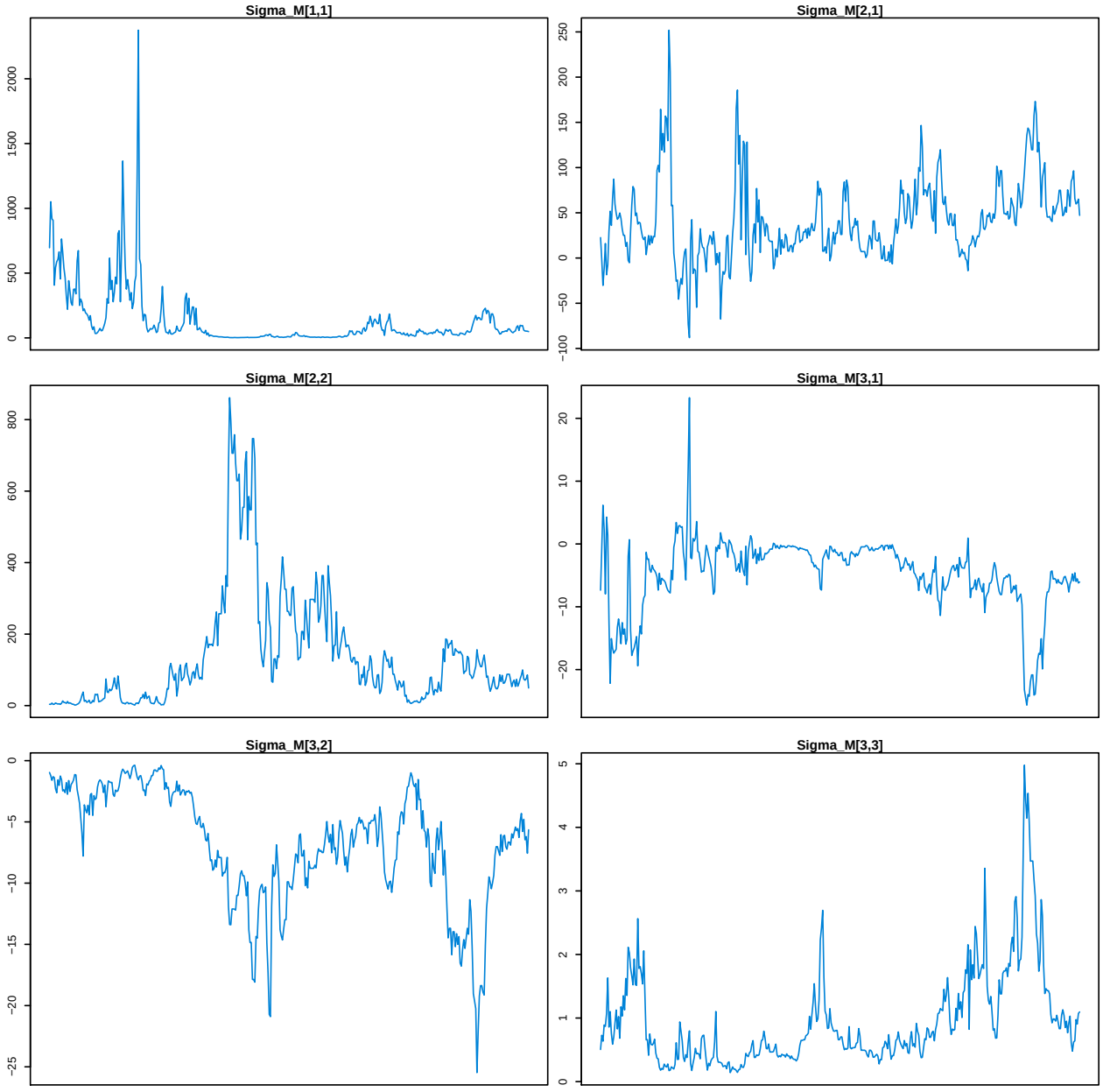

Gamma[1,2,1]
1.4
1.2
1.0
0.8
0.6

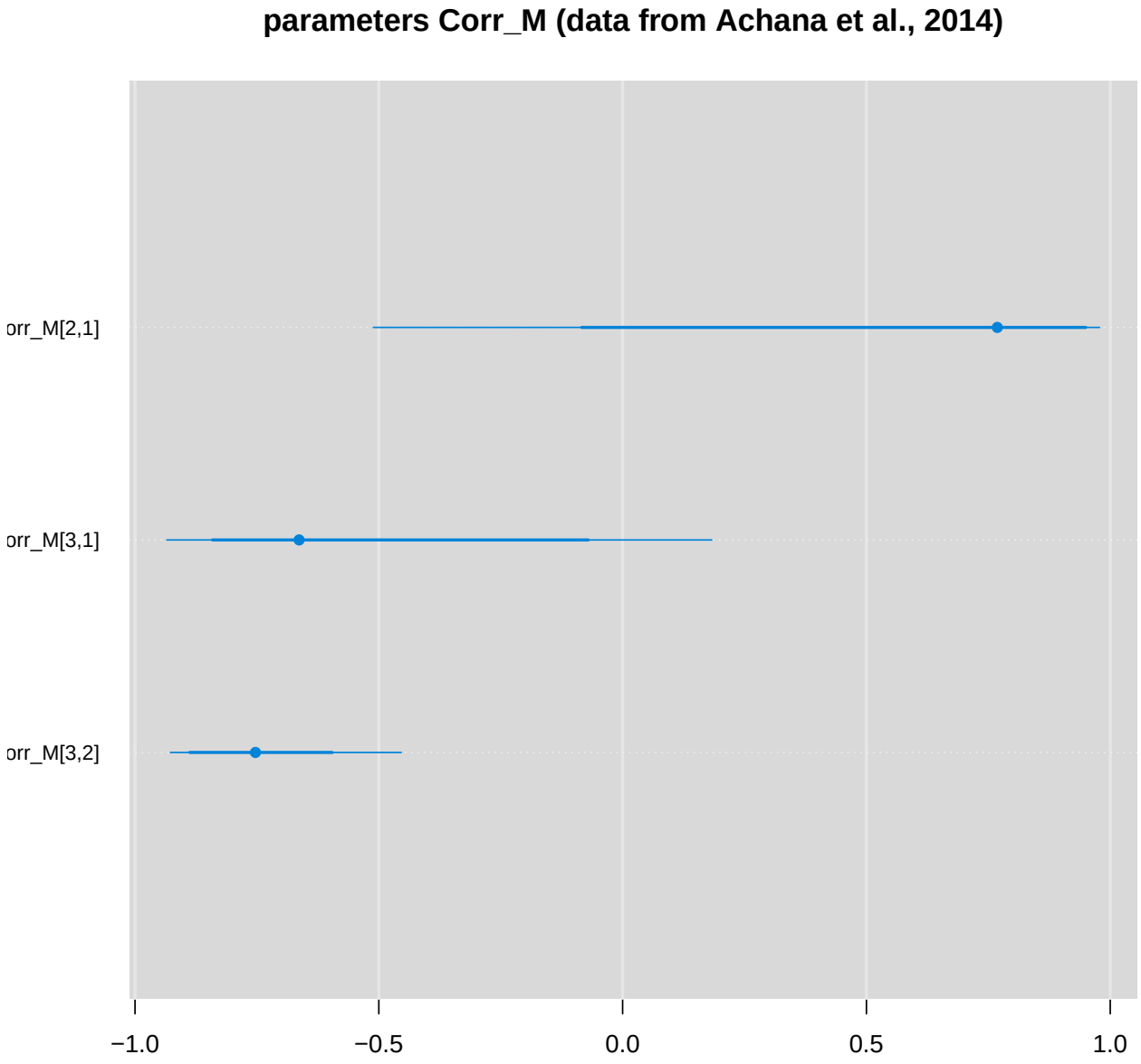

Gamma[1,3,1]
1.4
1.2
1.0
0.8
0.6

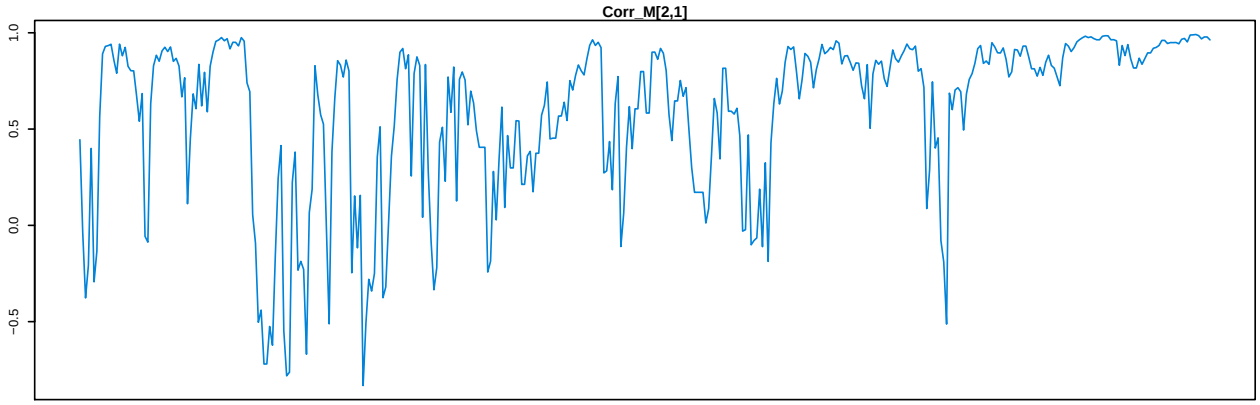

Gamma[1,3,2]
1.4
1.2
1.0
0.8
0.6

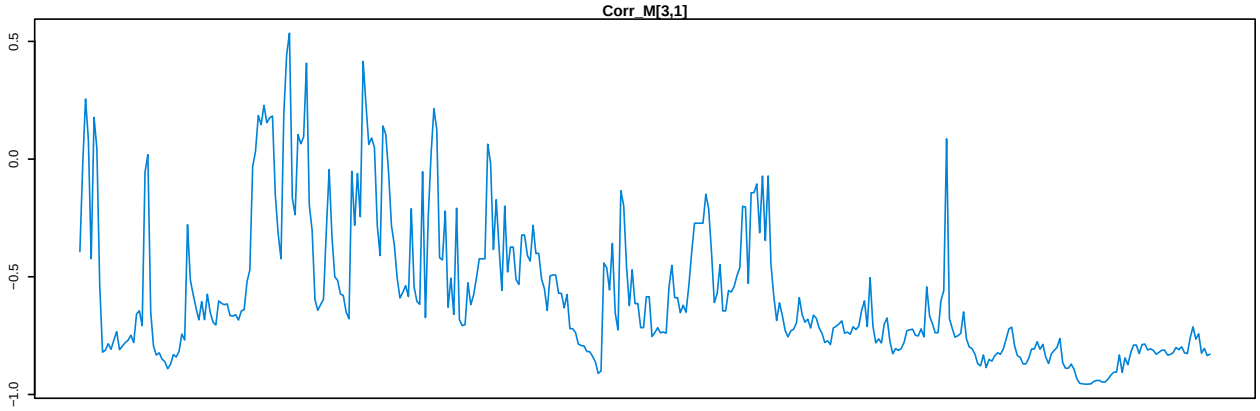
$\boldsymbol{\Sigma_M}$ **(common between-study covariance structure)**

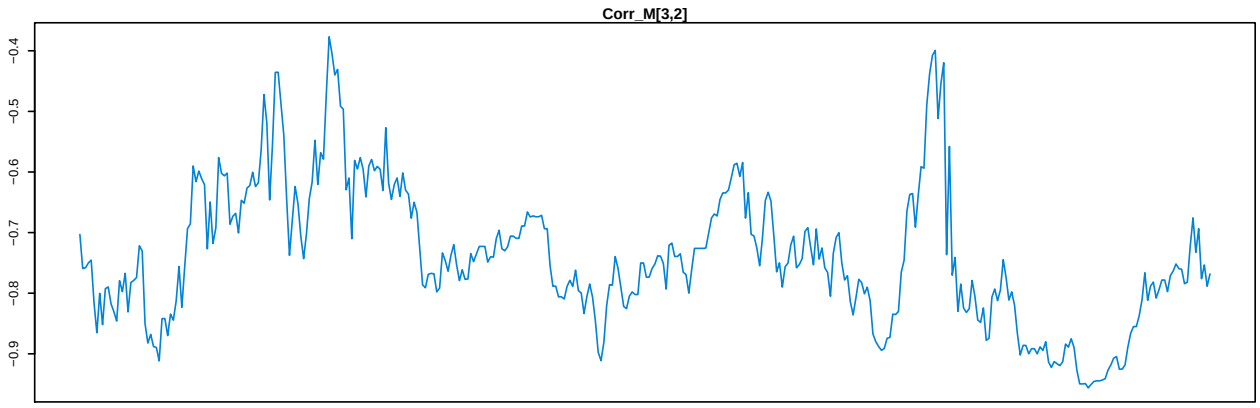



Sigma_M[1,1]
Sigma_M[2,1]
Sigma_M[2,2]
Sigma_M[3,1]
Sigma_M[3,2]
Sigma_M[3,3]

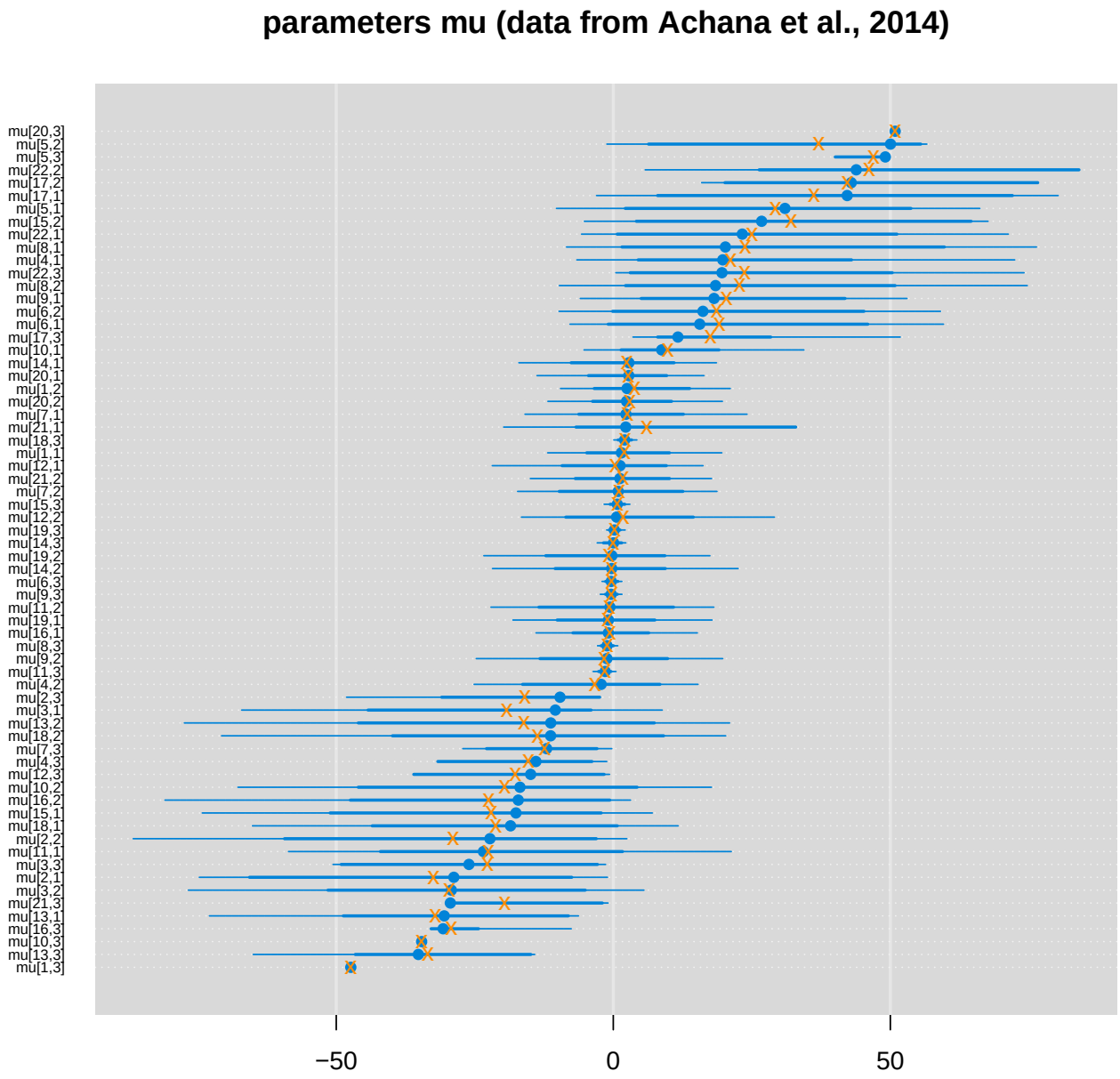

parameters Corr_M (data from Achana et al., 2014)
orr_M[2,1]
orr_M[3,1]
orr_M[3,2]
−1.0
−0.5
0.0
0.5
1.0

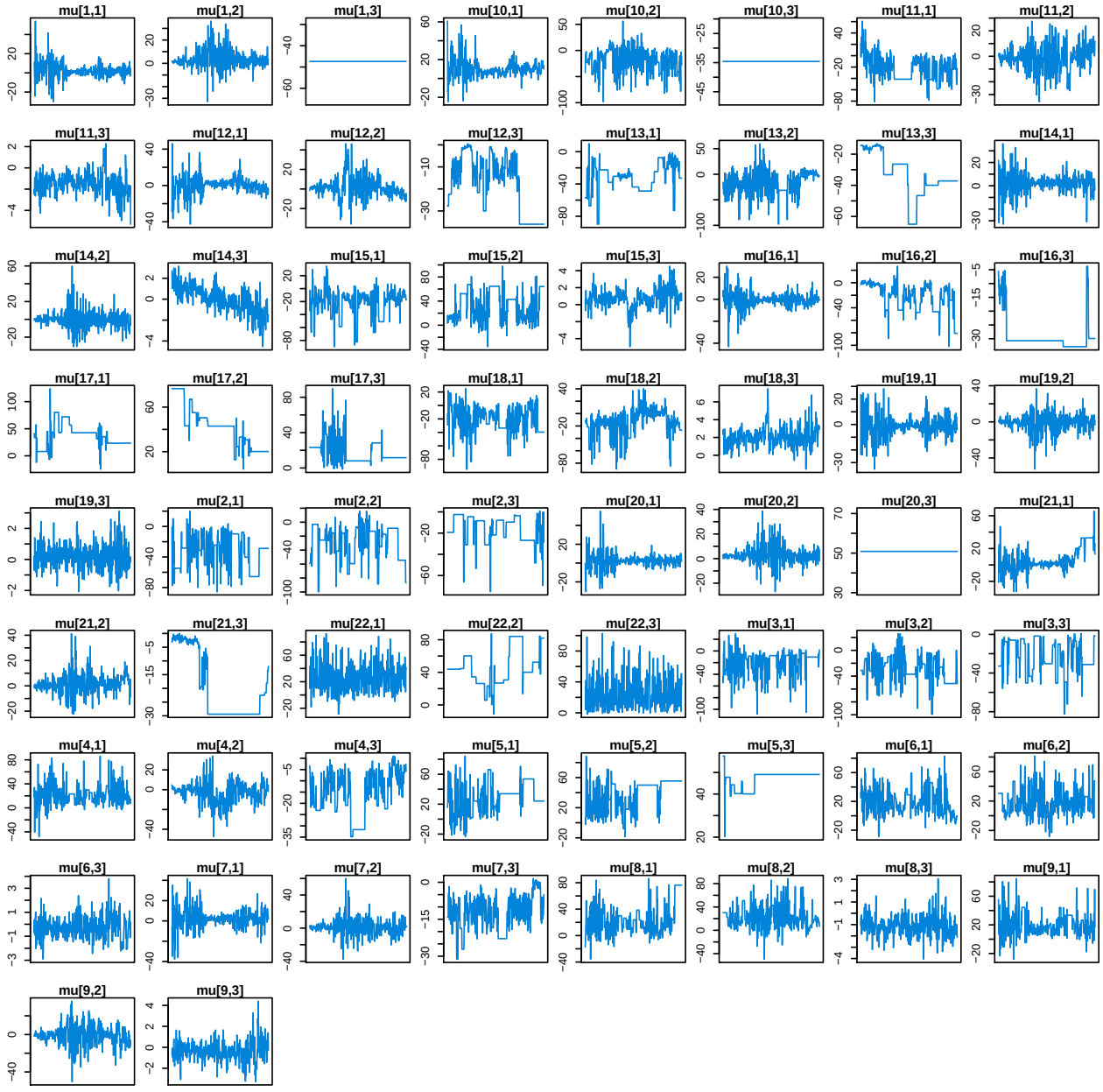

Corr_M[2,1]
1.0
0.5
0.0
−0.5


Corr_M[3,1]
0.5
0.0
−0.5
−1.0

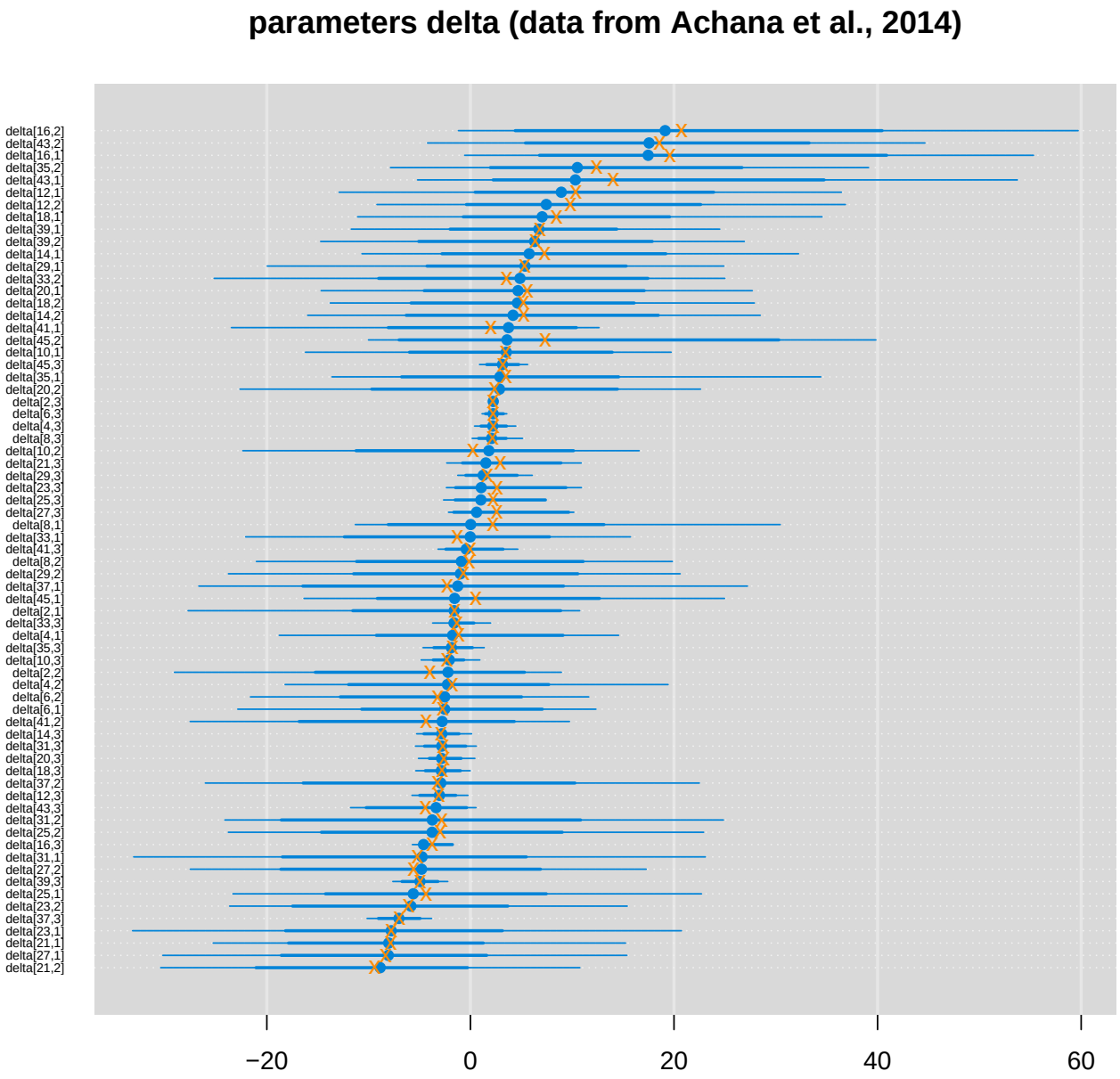

Corr_M[3,2]
−0.4
−0.5
−0.6
−0.7
−0.8
−0.9

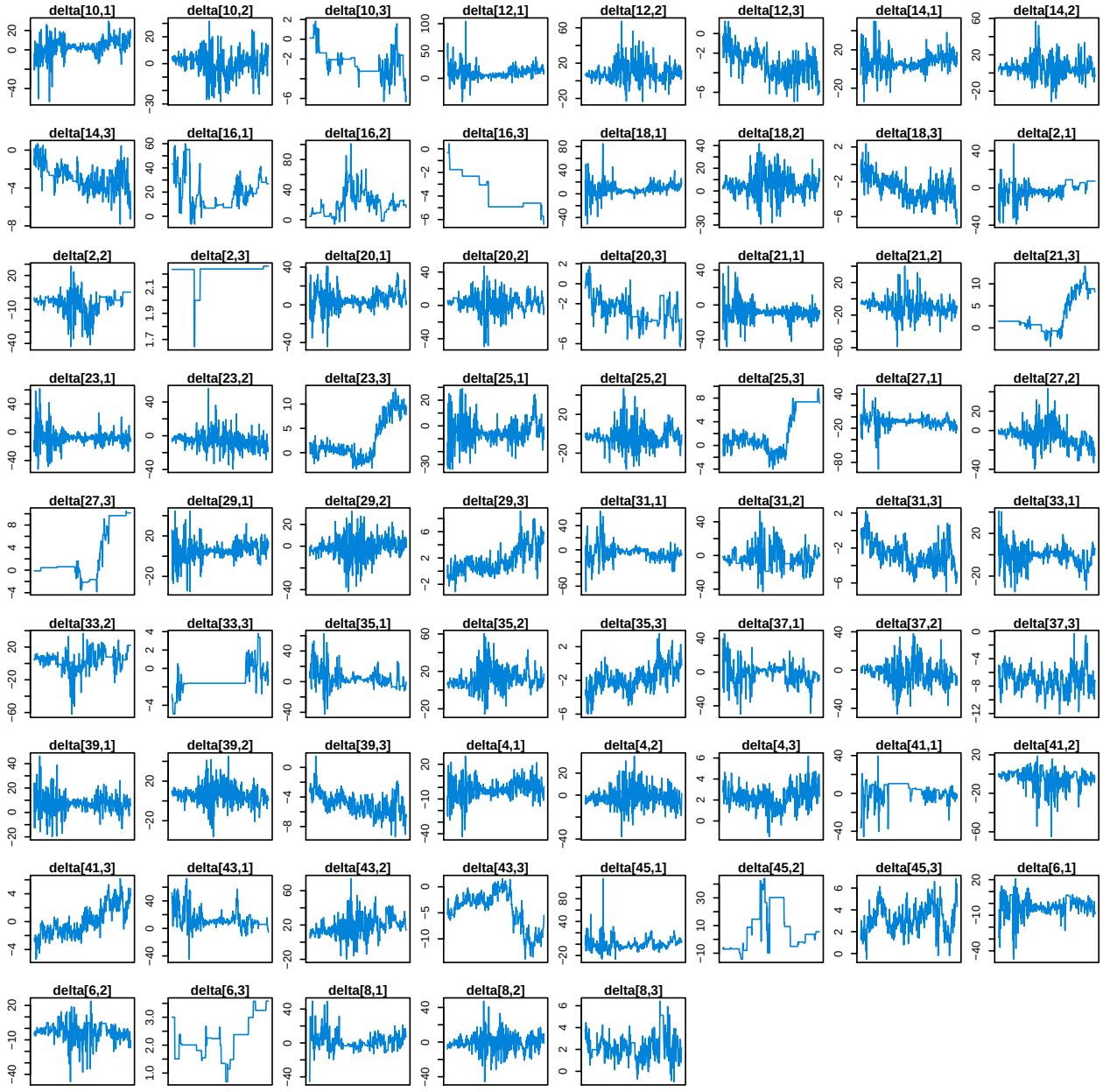
μ (study-specific baseline effects)



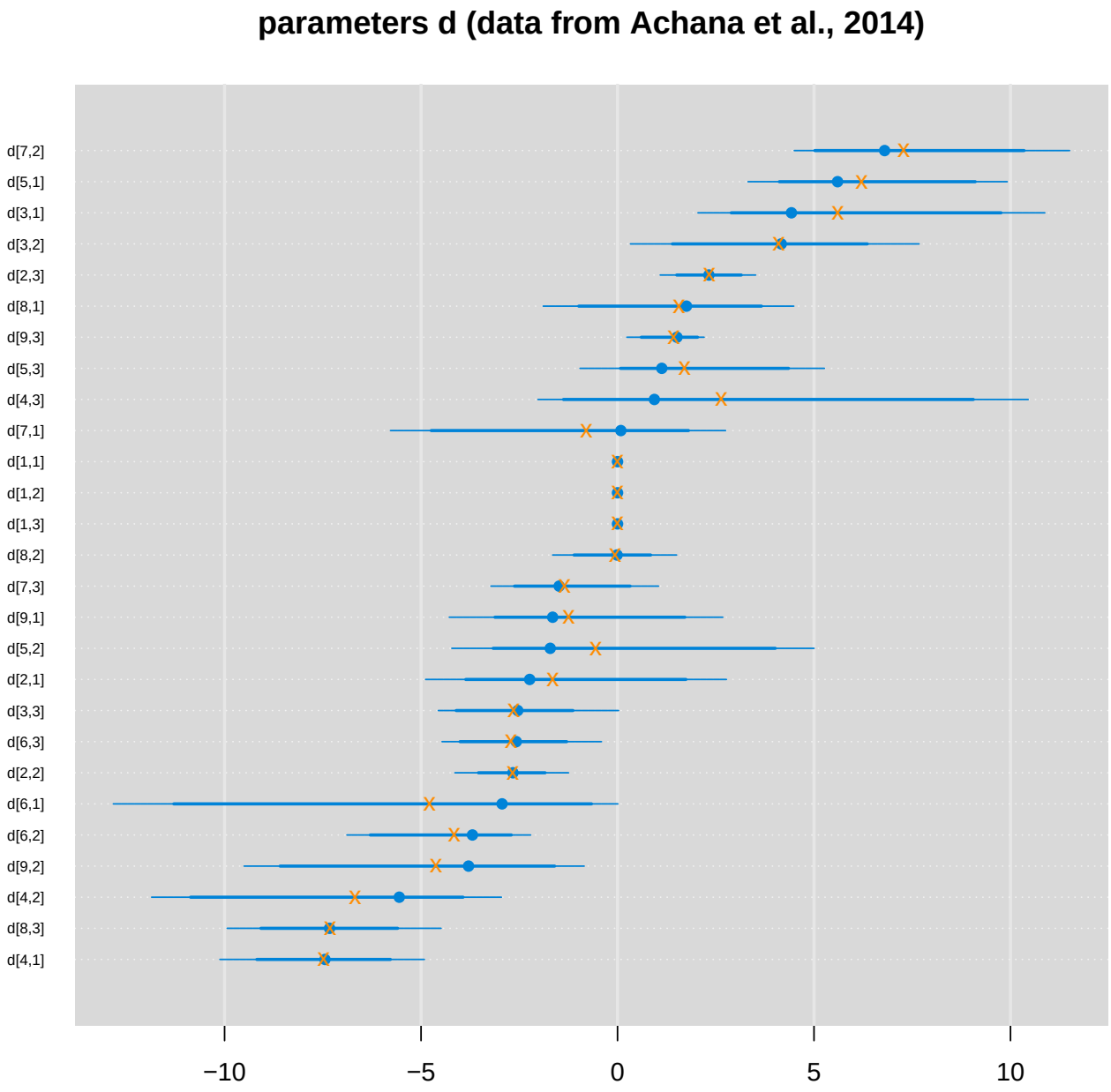

mu[1,1]
mu[1,2]
mu[1,3]
mu[10,1]
mu[10,2]
mu[10,3]
mu[11,1]
mu[11,2]
mu[11,3]
mu[12,1]
mu[12,2]
mu[12,3]
mu[13,1]
mu[13,2]
mu[13,3]
mu[14,1]
mu[14,2]
mu[14,3]
mu[15,1]
mu[15,2]
mu[15,3]
mu[16,1]
mu[16,2]
mu[16,3]
mu[17,1]
mu[17,2]
mu[17,3]
mu[18,1]
mu[18,2]
mu[18,3]
mu[19,1]
mu[19,2]
mu[19,3]
mu[2,1]
mu[2,2]
mu[2,3]
mu[20,1]
mu[20,2]
mu[20,3]
mu[21,1]
mu[21,2]
mu[21,3]
mu[22,1]
mu[22,2]
mu[22,3]
mu[3,1]
mu[3,2]
mu[3,3]
mu[4,1]
mu[4,2]
mu[4,3]
mu[5,1]
mu[5,2]
mu[5,3]
mu[6,1]
mu[6,2]
mu[6,3]
mu[7,1]
mu[7,2]
mu[7,3]
mu[8,1]
mu[8,2]
mu[8,3]
mu[9,1]
mu[9,2]
mu[9,3]

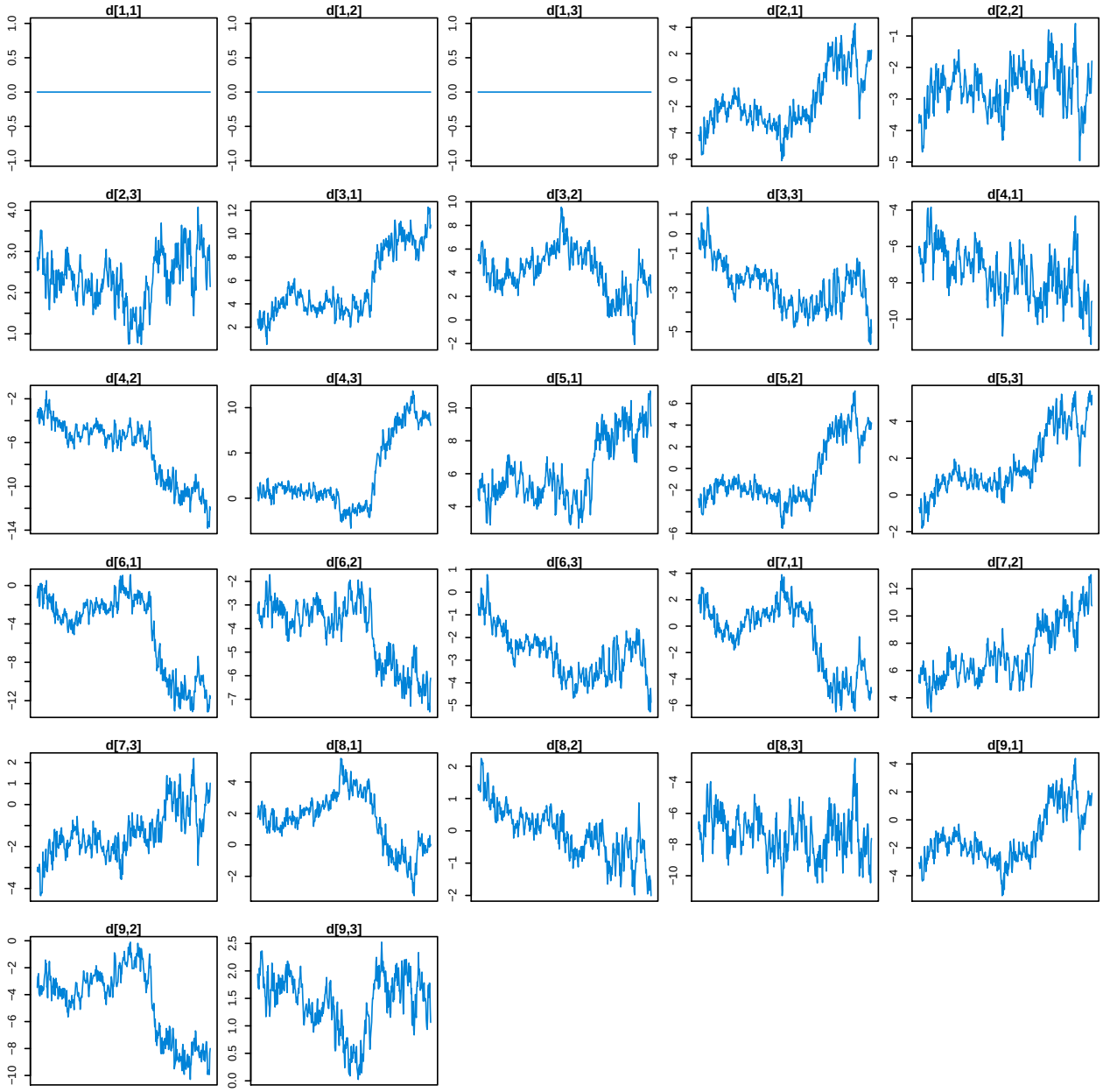
δ (study-specific [random] treatment effects)



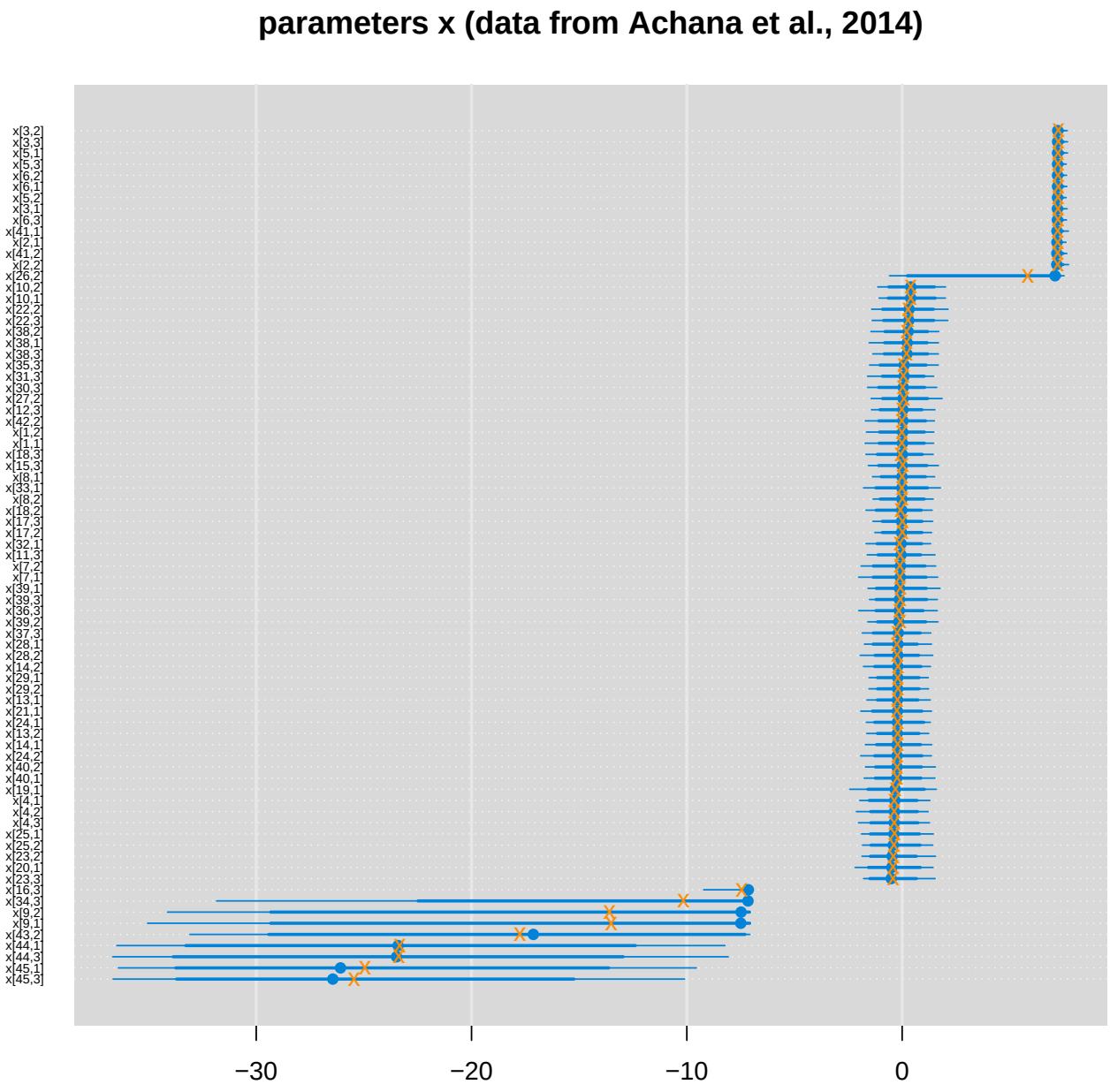

delta[10,1]
delta[10,2]
delta[10,3]
delta[12,1]
delta[12,2]
delta[12,3]
delta[14,1]
delta[14,2]
delta[14,3]
delta[16,1]
delta[16,2]
delta[16,3]
delta[18,1]
delta[18,2]
delta[18,3]
delta[2,1]
delta[2,2]
delta[2,3]
delta[20,1]
delta[20,2]
delta[20,3]
delta[21,1]
delta[21,2]
delta[21,3]
delta[23,1]
delta[23,2]
delta[23,3]
delta[25,1]
delta[25,2]
delta[25,3]
delta[27,1]
delta[27,2]
delta[27,3]
delta[29,1]
delta[29,2]
delta[29,3]
delta[31,1]
delta[31,2]
delta[31,3]
delta[33,1]
delta[33,2]
delta[33,3]
delta[35,1]
delta[35,2]
delta[35,3]
delta[37,1]
delta[37,2]
delta[37,3]
delta[39,1]
delta[39,2]
delta[39,3]
delta[4,1]
delta[4,2]
delta[4,3]
delta[41,1]
delta[41,2]
delta[41,3]
delta[43,1]
delta[43,2]
delta[43,3]
delta[45,1]
delta[45,2]
delta[45,3]
delta[6,1]
delta[6,2]
delta[6,3]
delta[8,1]
delta[8,2]
delta[8,3]

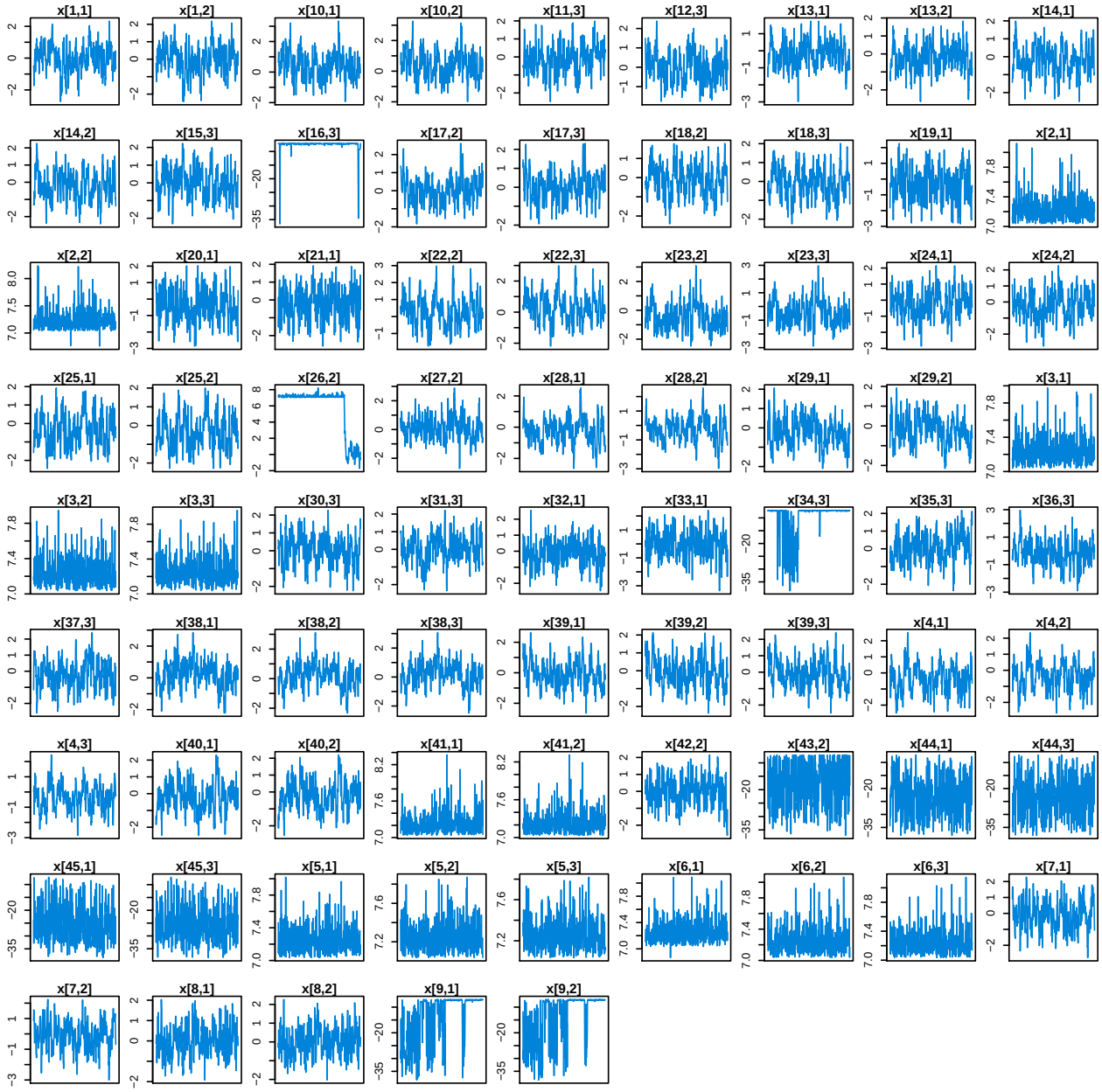
d (pooled treatment effects across trials)




d[1,1]
d[1,2]
d[1,3]
d[2,1]
d[2,2]
d[2,3]
d[3,1]
d[3,2]
d[3,3]
d[4,1]
d[4,2]
d[4,3]
d[5,1]
d[5,2]
d[5,3]
d[6,1]
d[6,2]
d[6,3]
d[7,1]
d[7,2]
d[7,3]
d[8,1]
d[8,2]
d[8,3]
d[9,1]
d[9,2]
d[9,3]

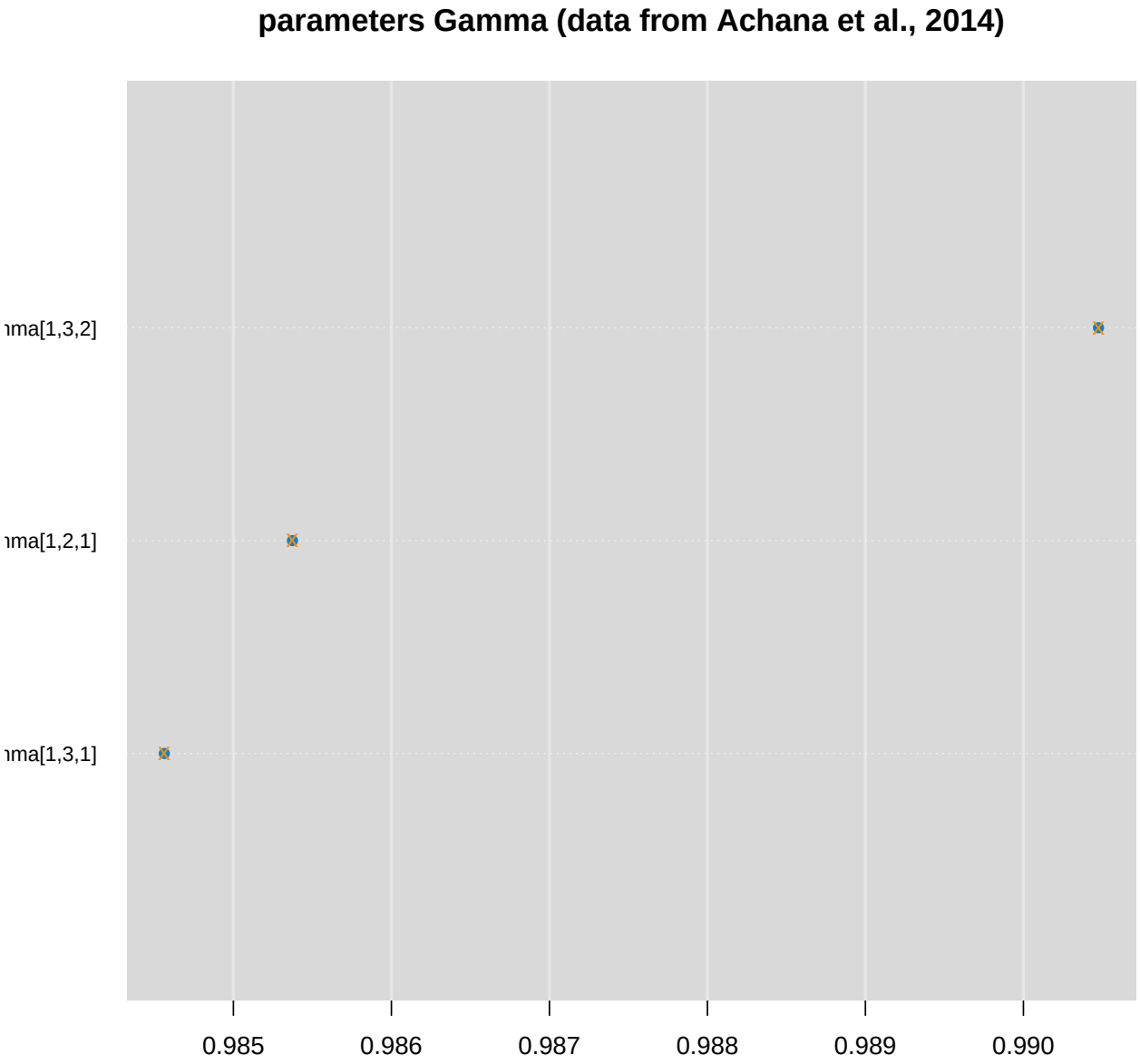
$\boldsymbol{x}$ (latent variables)

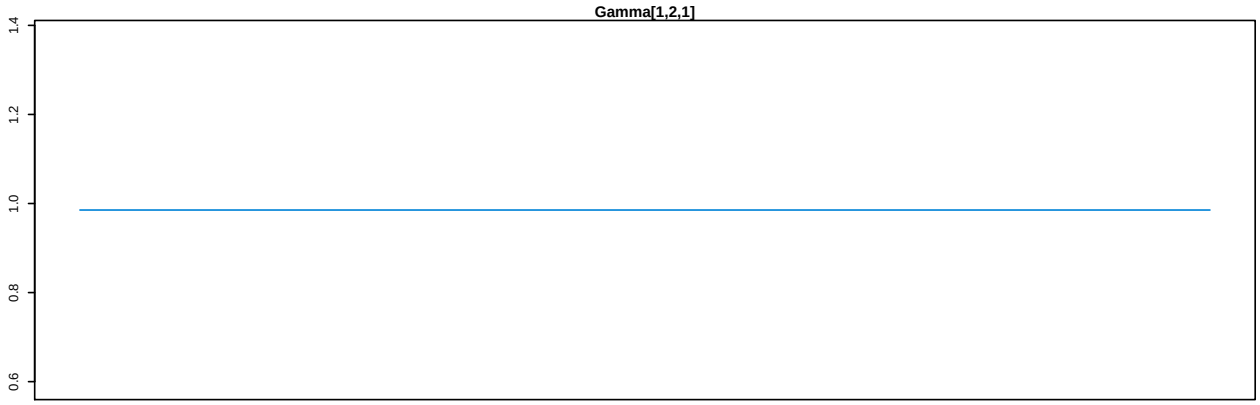


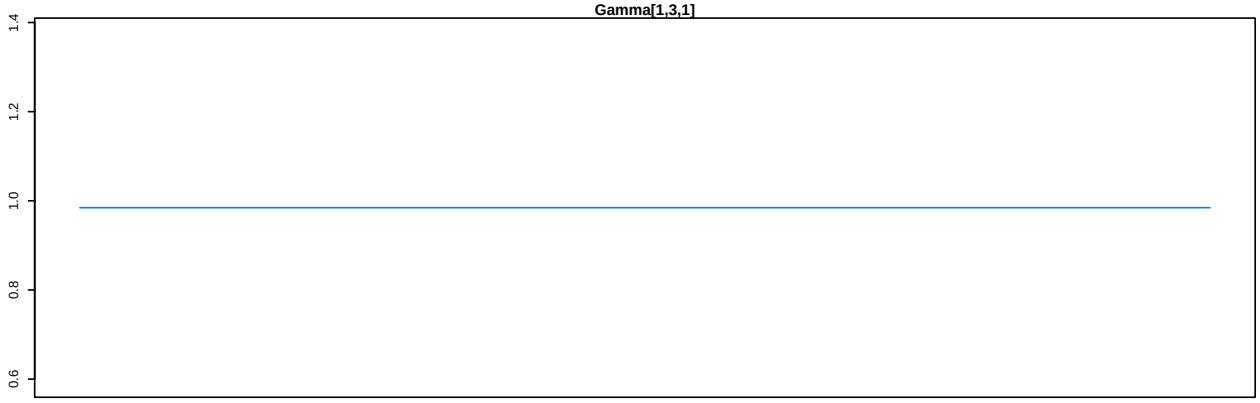

x[1,1]
x[1,2]
x[10,1]
x[10,2]
x[11,3]
x[12,3]
x[13,1]
x[13,2]
x[14,1]
x[14,2]
x[15,3]
x[16,3]
x[17,2]
x[17,3]
x[18,2]
x[18,3]
x[19,1]
x[2,1]
x[2,2]
x[20,1]
x[21,1]
x[22,2]
x[22,3]
x[23,2]
x[23,3]
x[24,1]
x[24,2]
x[25,1]
x[25,2]
x[26,2]
x[27,2]
x[28,1]
x[28,2]
x[29,1]
x[29,2]
x[3,1]
x[3,2]
x[3,3]
x[30,3]
x[31,3]
x[32,1]
x[33,1]
x[34,3]
x[35,3]
x[36,3]
x[37,3]
x[38,1]
x[38,2]
x[38,3]
x[39,1]
x[39,2]
x[39,3]
x[4,1]
x[4,2]
x[4,3]
x[40,1]
x[40,2]
x[41,1]
x[41,2]
x[42,2]
x[43,2]
x[44,1]
x[44,3]
x[45,1]
x[45,3]
x[5,1]
x[5,2]
x[5,3]
x[6,1]
x[6,2]
x[6,3]
x[7,1]
x[7,2]
x[8,1]
x[8,2]
x[9,1]
x[9,2]

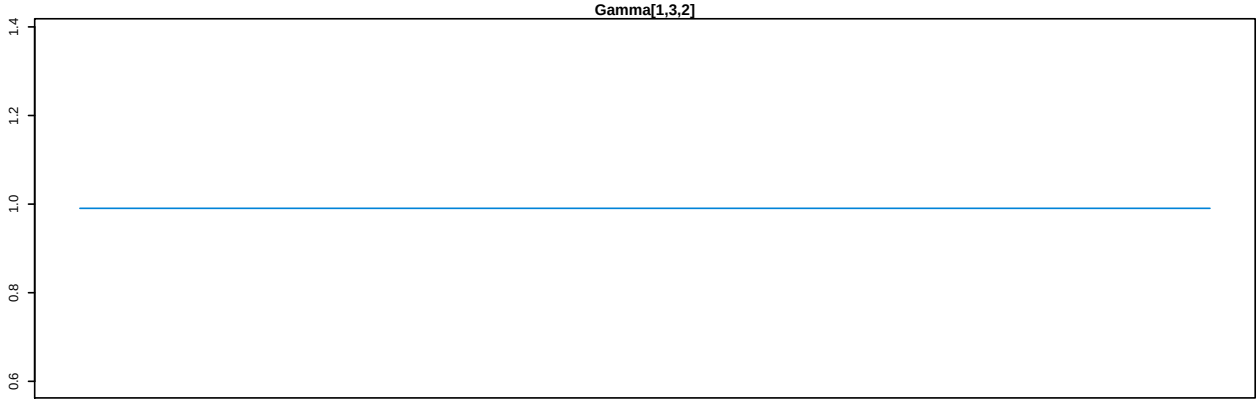
Γ fixed – μ and δ constrained

Γ (outcome copula correlation matrix)

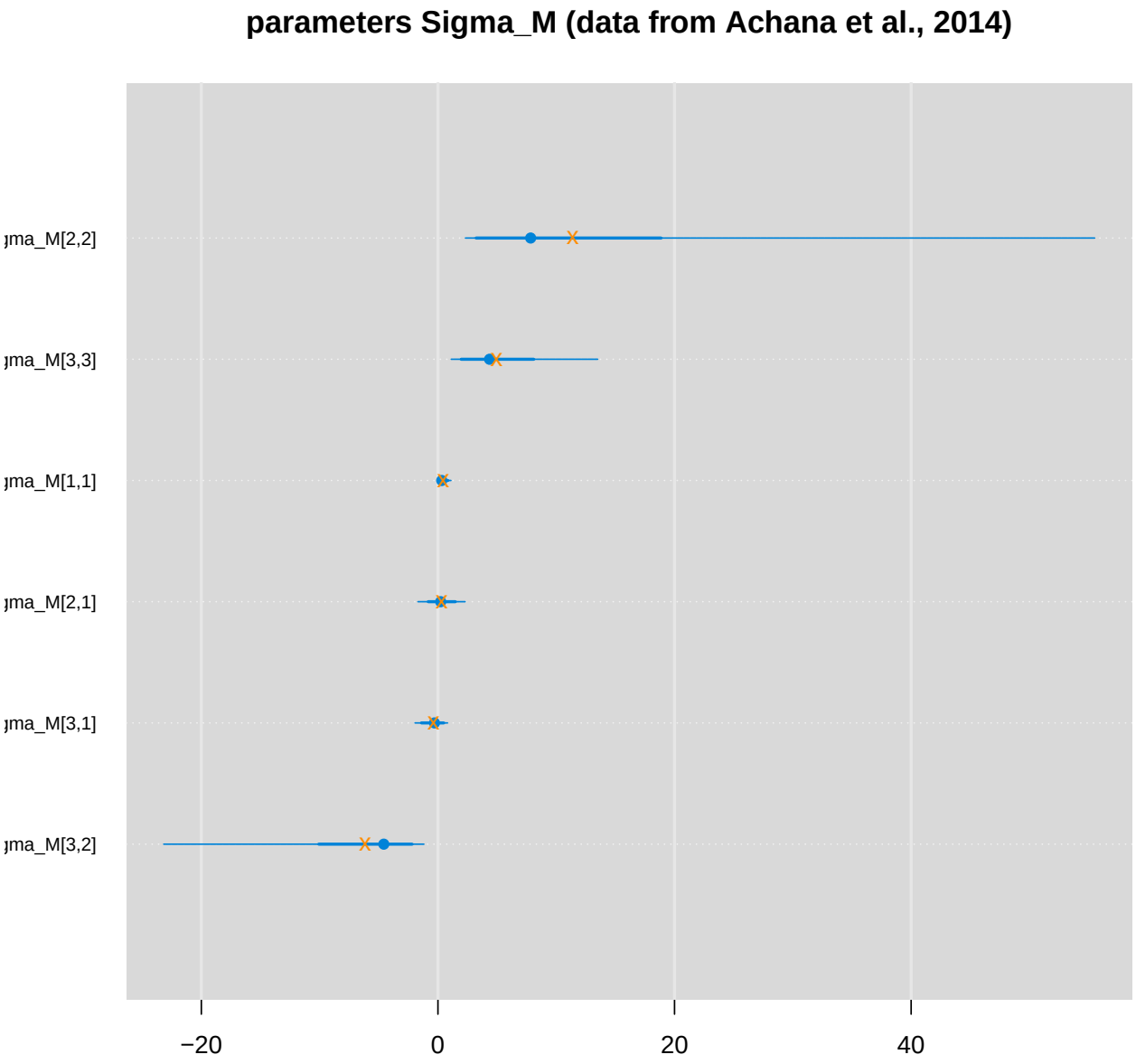


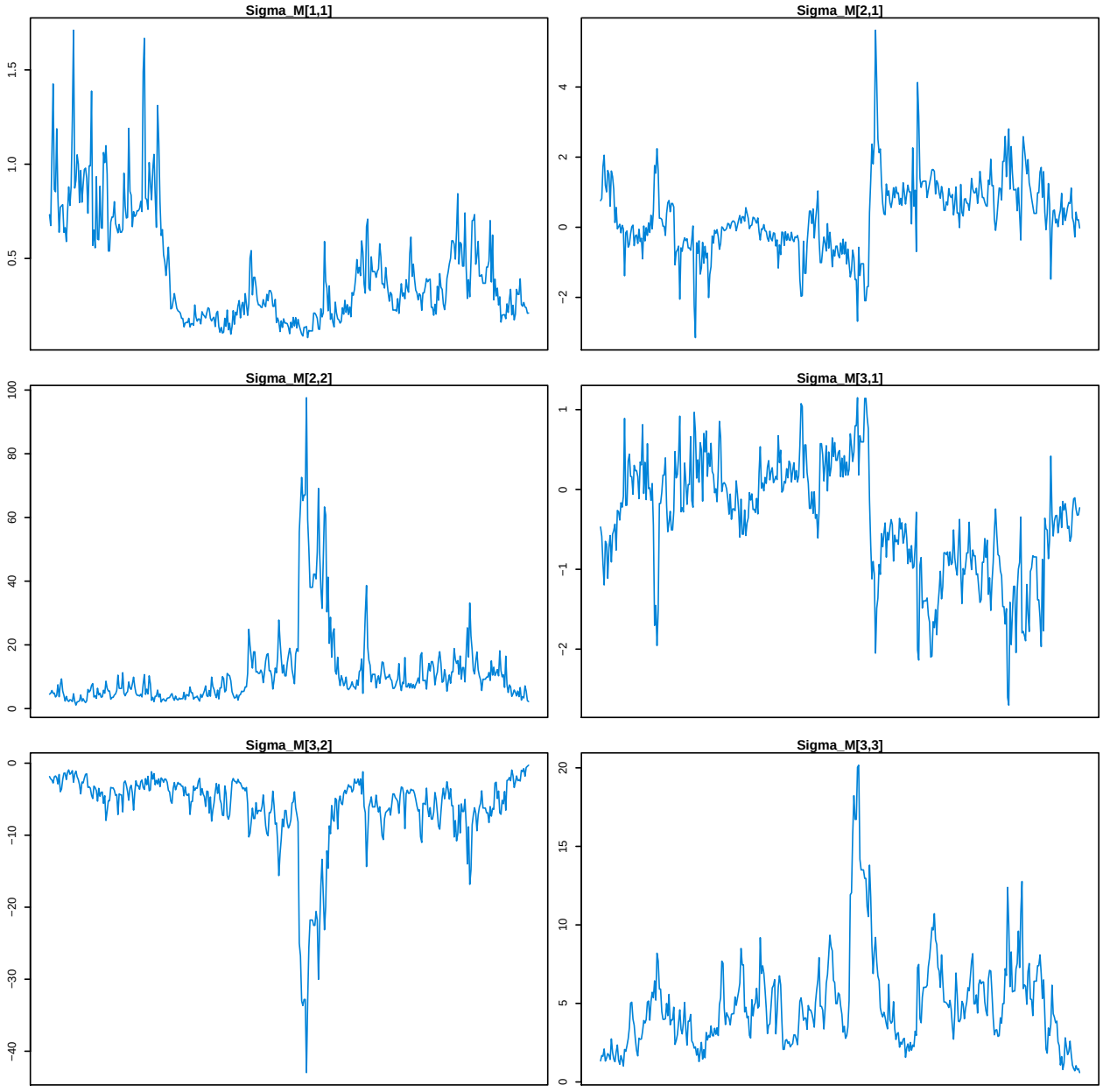

Gamma[1,2,1]
1.4
1.2
1.0
0.8
0.6

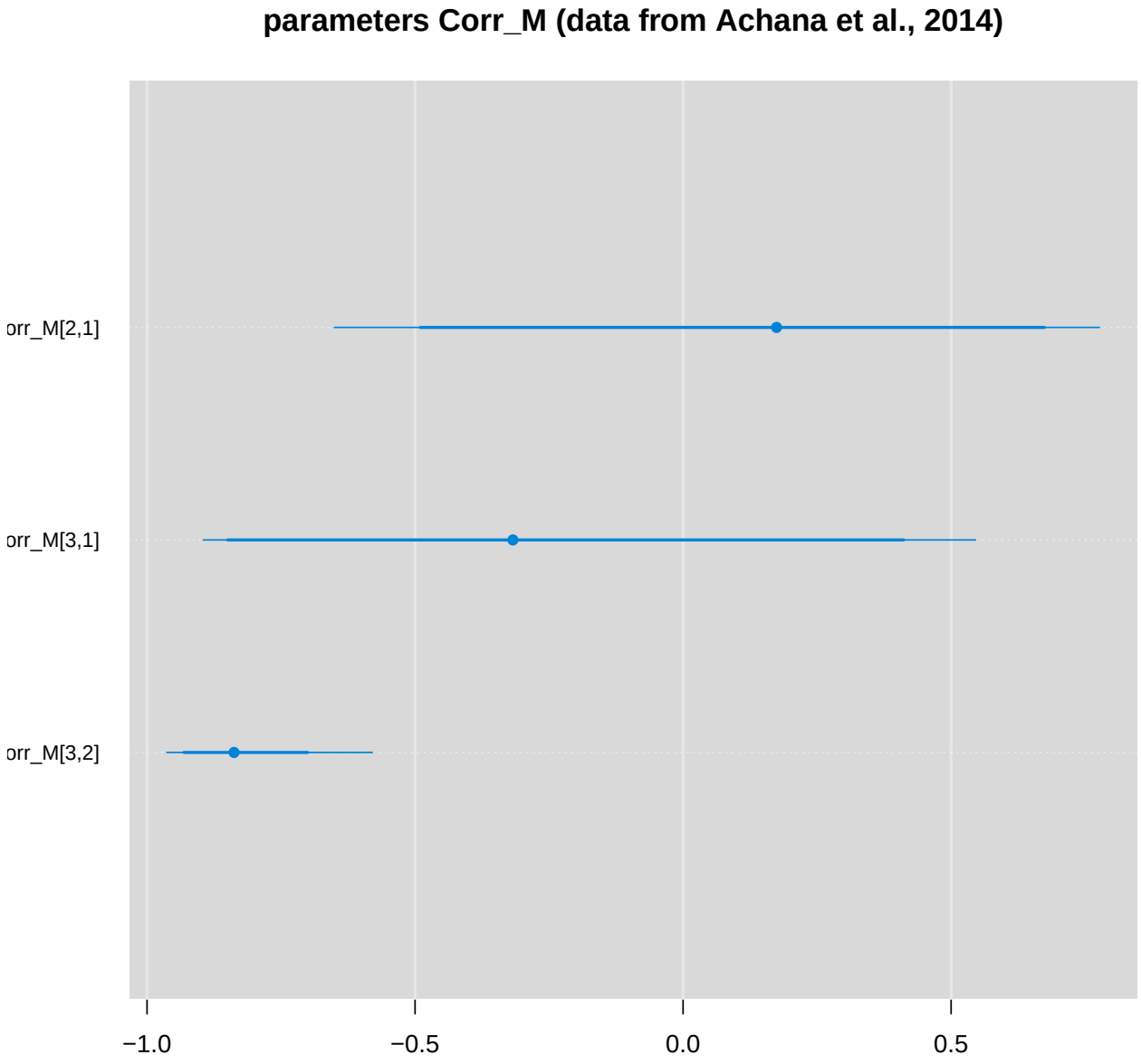

Gamma[1,3,1]
1.4
1.2
1.0
0.8
0.6

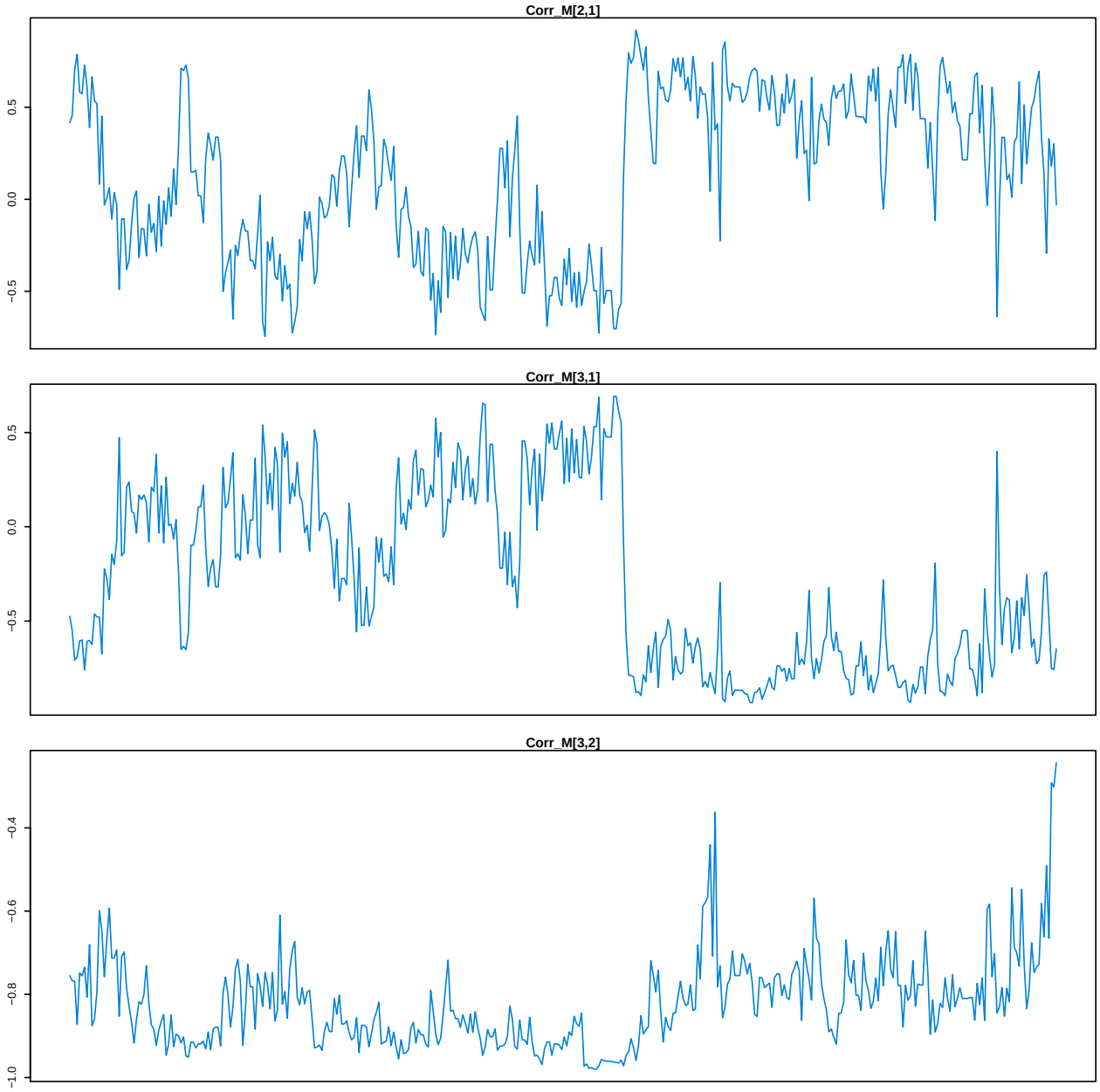

Gamma[1,3,2]
1.4
1.2
1.0
0.8
0.6

$\boldsymbol{\Sigma}_M$ (common between-study covariance structure)

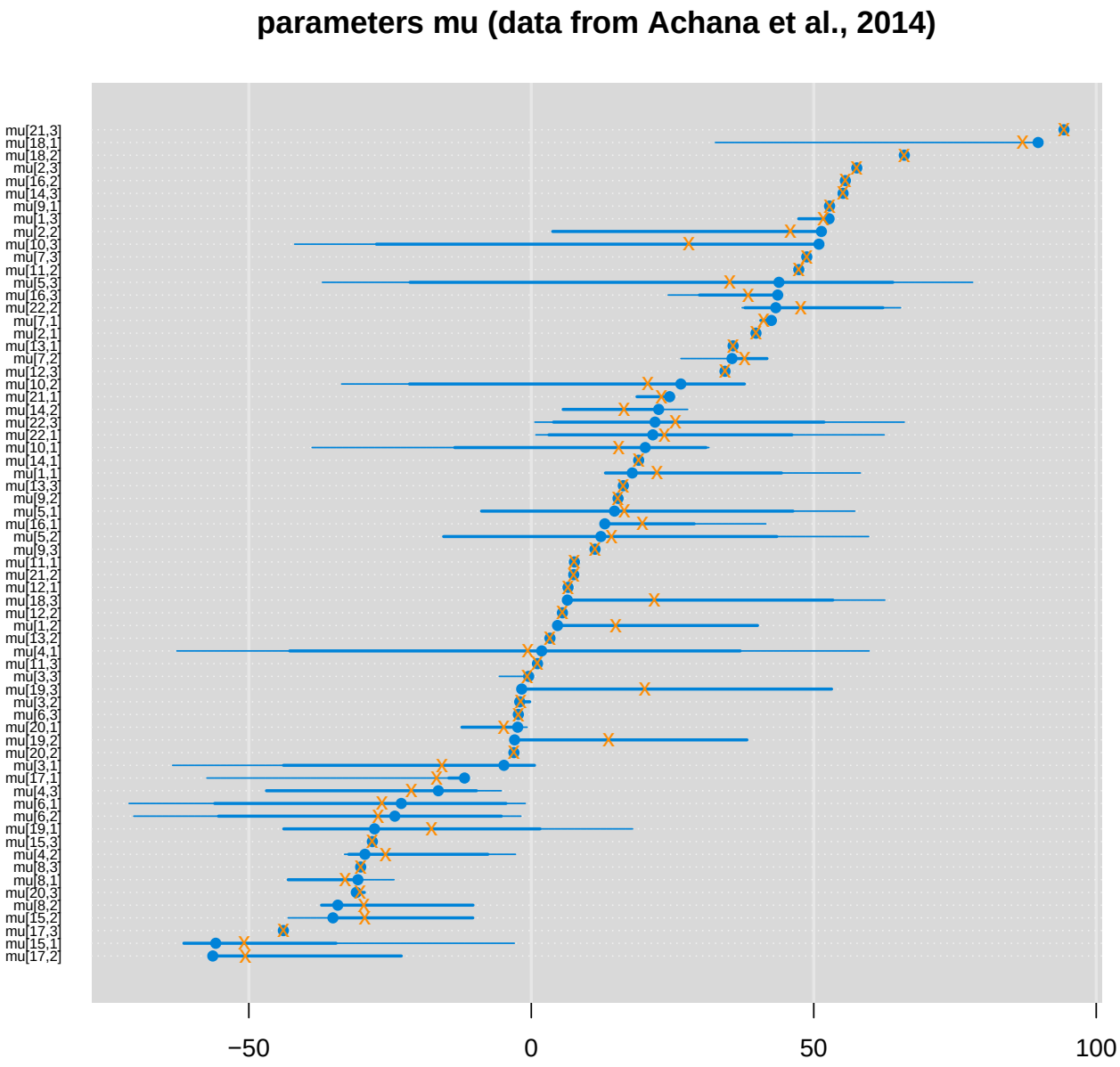


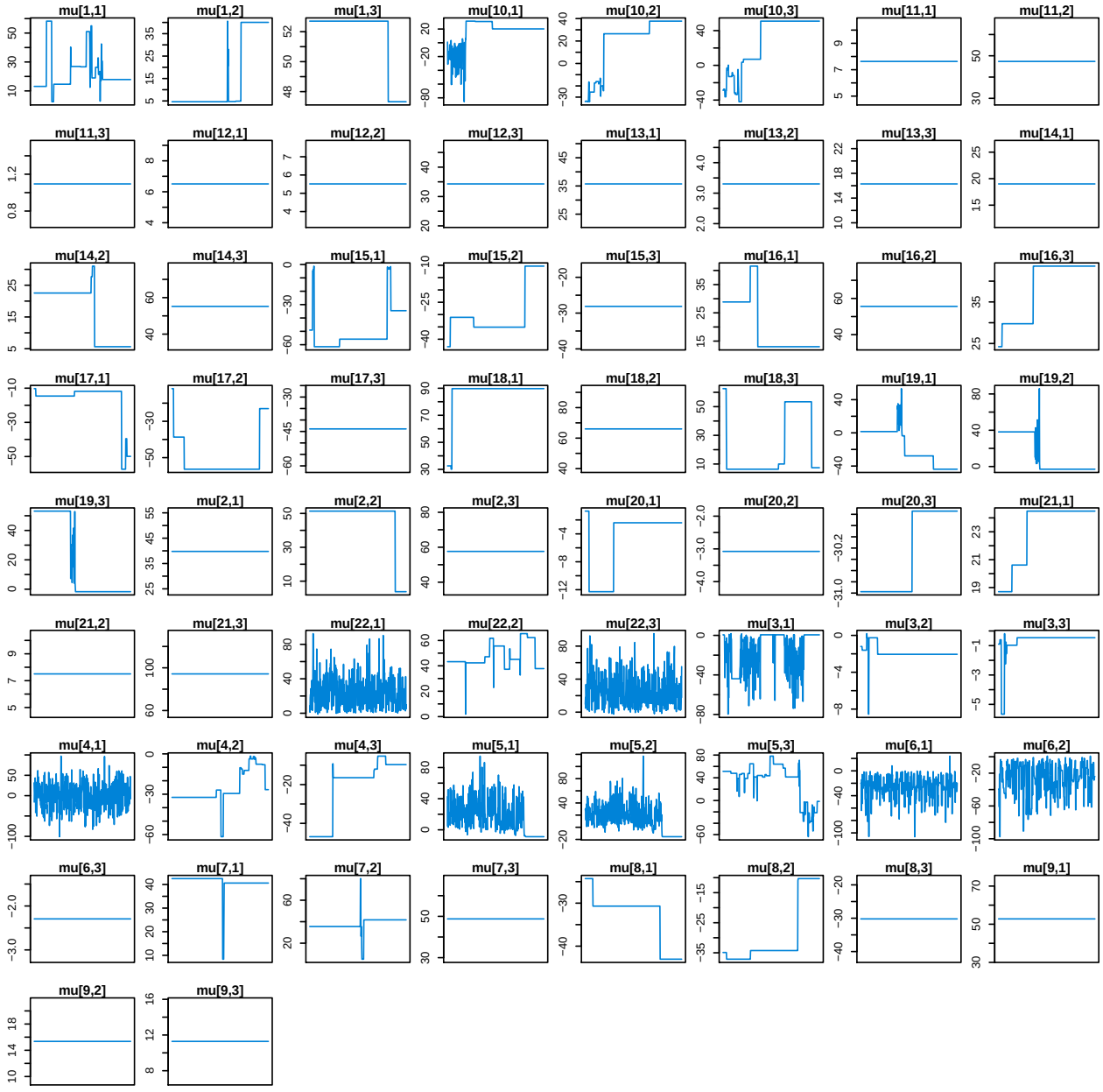

Sigma_M[1,1]
Sigma_M[2,1]
Sigma_M[2,2]
Sigma_M[3,1]
Sigma_M[3,2]
Sigma_M[3,3]


parameters Corr_M (data from Achana et al., 2014)
orr_M[2,1]
orr_M[3,1]
orr_M[3,2]
−1.0
−0.5
0.0
0.5

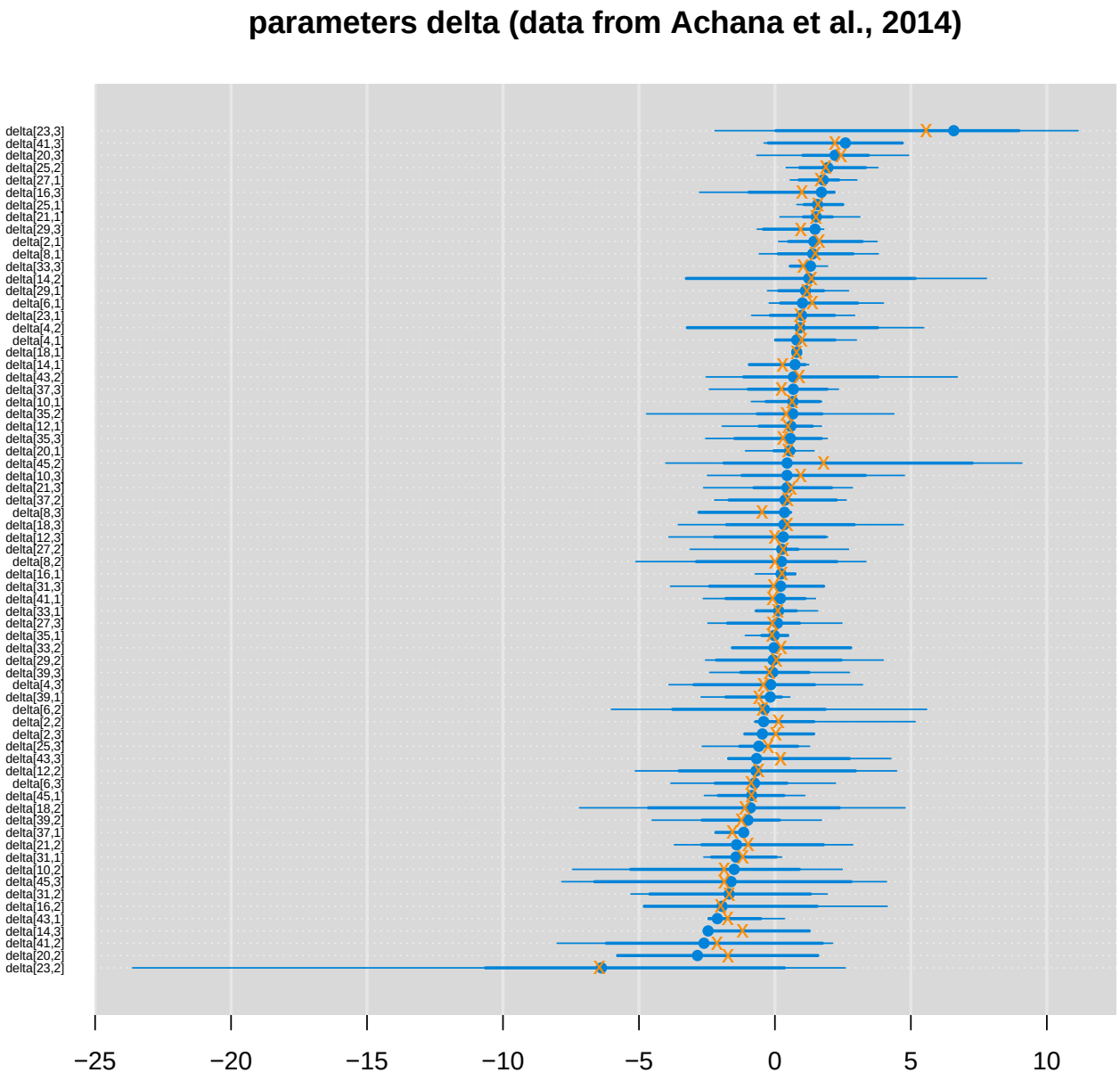

Corr_M[2,1]
0.5
0.0
−0.5
Corr_M[3,1]
0.5
0.0
−0.5
Corr_M[3,2]
−0.4
−0.6
−0.8
−1.0

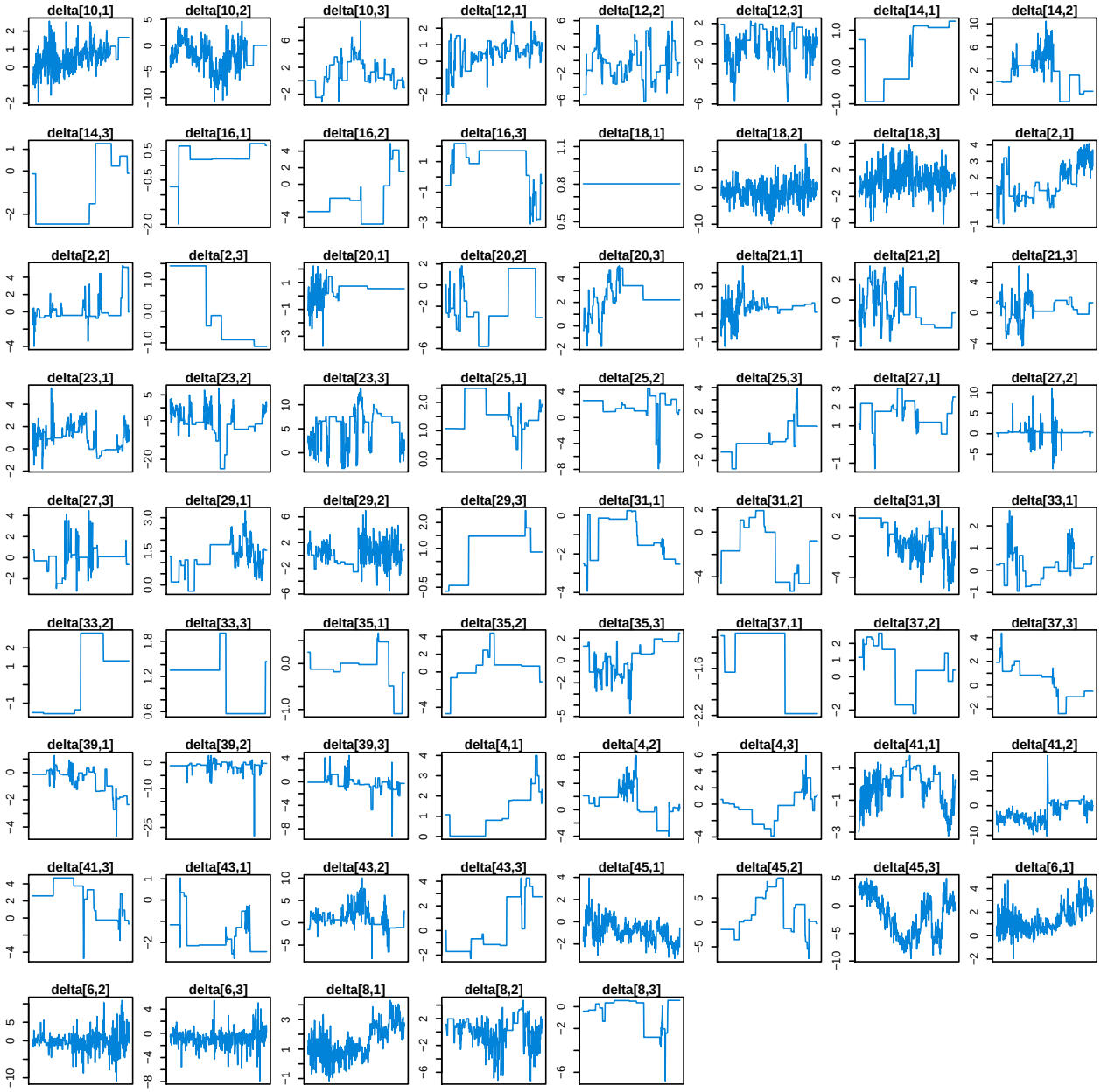
μ (study-specific baseline effects)



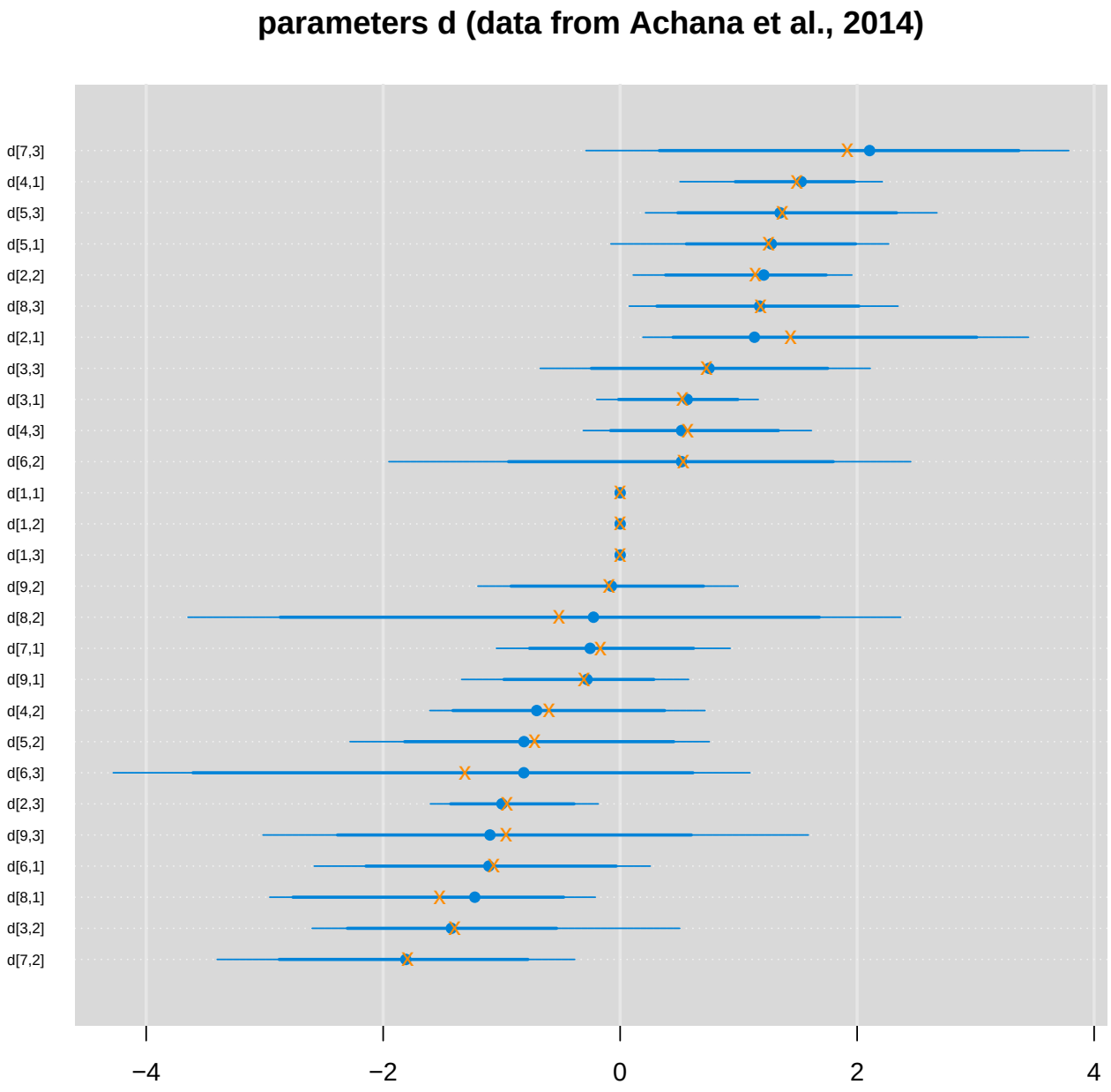

mu[1,1]
mu[1,2]
mu[1,3]
mu[10,1]
mu[10,2]
mu[10,3]
mu[11,1]
mu[11,2]
mu[11,3]
mu[12,1]
mu[12,2]
mu[12,3]
mu[13,1]
mu[13,2]
mu[13,3]
mu[14,1]
mu[14,2]
mu[14,3]
mu[15,1]
mu[15,2]
mu[15,3]
mu[16,1]
mu[16,2]
mu[16,3]
mu[17,1]
mu[17,2]
mu[17,3]
mu[18,1]
mu[18,2]
mu[18,3]
mu[19,1]
mu[19,2]
mu[19,3]
mu[2,1]
mu[2,2]
mu[2,3]
mu[20,1]
mu[20,2]
mu[20,3]
mu[21,1]
mu[21,2]
mu[21,3]
mu[22,1]
mu[22,2]
mu[22,3]
mu[3,1]
mu[3,2]
mu[3,3]
mu[4,1]
mu[4,2]
mu[4,3]
mu[5,1]
mu[5,2]
mu[5,3]
mu[6,1]
mu[6,2]
mu[6,3]
mu[7,1]
mu[7,2]
mu[7,3]
mu[8,1]
mu[8,2]
mu[8,3]
mu[9,1]
mu[9,2]
mu[9,3]

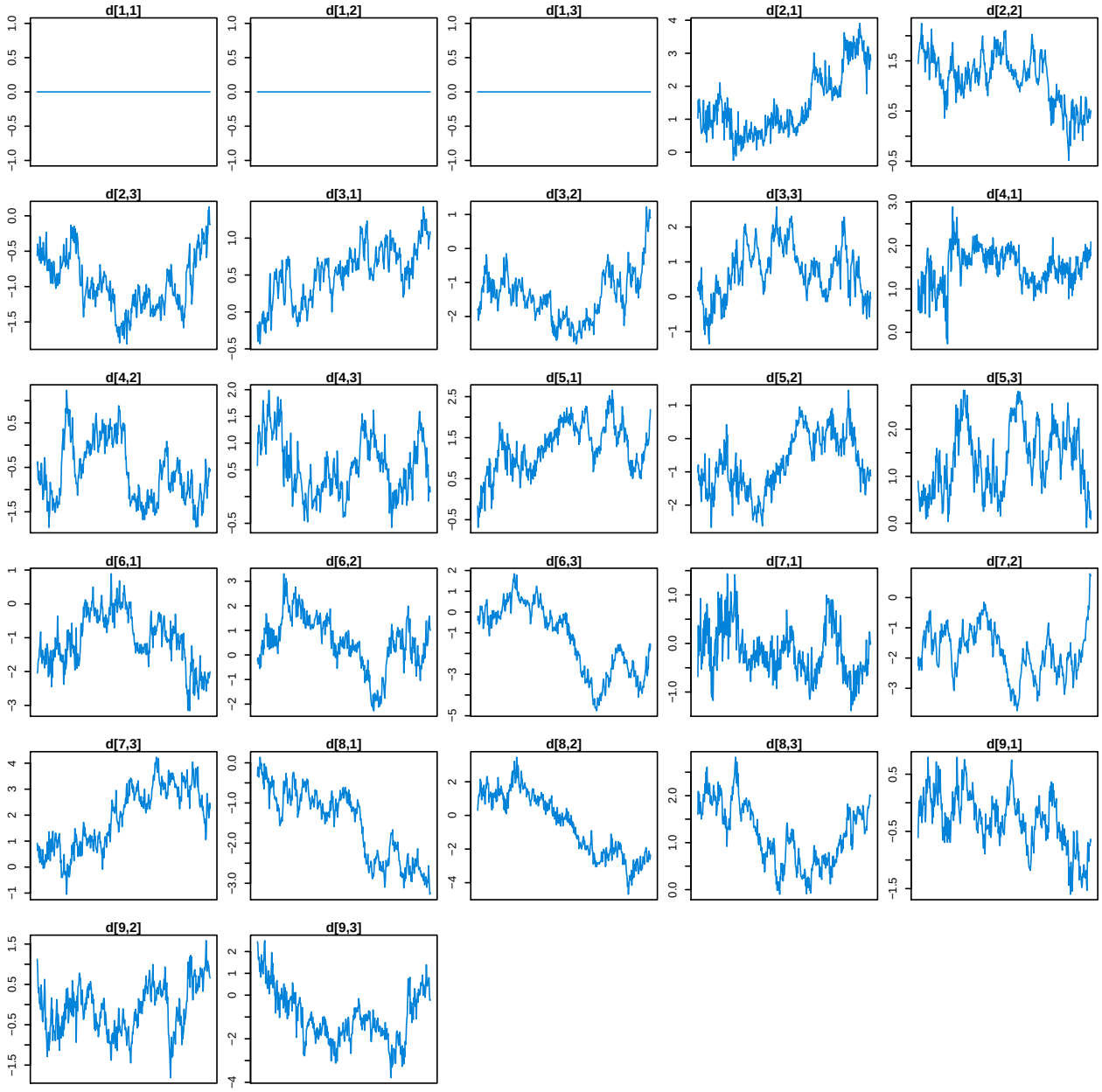
δ (study-specific [random] treatment effects)



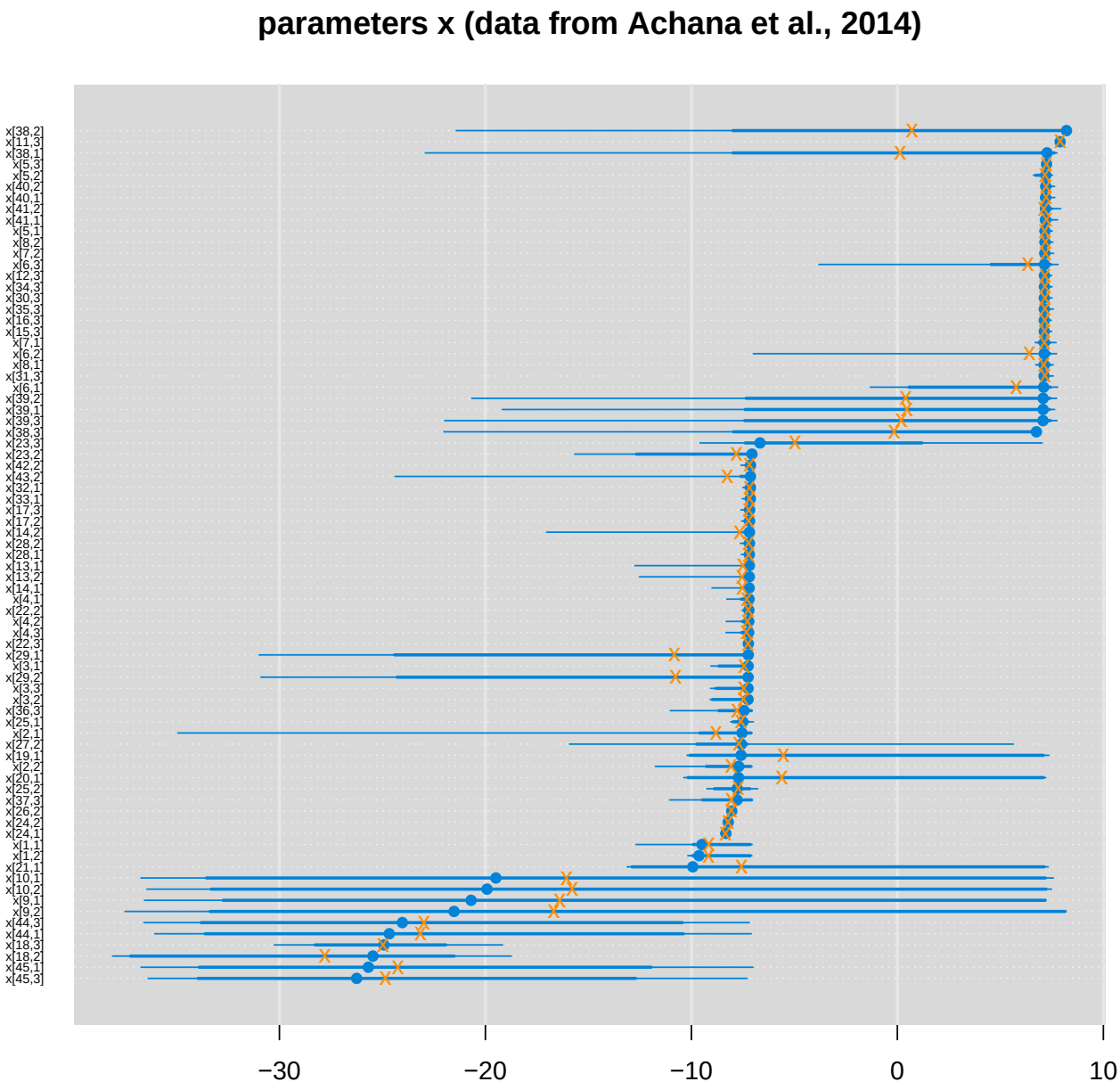

delta[10,1]
delta[10,2]
delta[10,3]
delta[12,1]
delta[12,2]
delta[12,3]
delta[14,1]
delta[14,2]
delta[14,3]
delta[16,1]
delta[16,2]
delta[16,3]
delta[18,1]
delta[18,2]
delta[18,3]
delta[2,1]
delta[2,2]
delta[2,3]
delta[20,1]
delta[20,2]
delta[20,3]
delta[21,1]
delta[21,2]
delta[21,3]
delta[23,1]
delta[23,2]
delta[23,3]
delta[25,1]
delta[25,2]
delta[25,3]
delta[27,1]
delta[27,2]
delta[27,3]
delta[29,1]
delta[29,2]
delta[29,3]
delta[31,1]
delta[31,2]
delta[31,3]
delta[33,1]
delta[33,2]
delta[33,3]
delta[35,1]
delta[35,2]
delta[35,3]
delta[37,1]
delta[37,2]
delta[37,3]
delta[39,1]
delta[39,2]
delta[39,3]
delta[4,1]
delta[4,2]
delta[4,3]
delta[41,1]
delta[41,2]
delta[41,3]
delta[43,1]
delta[43,2]
delta[43,3]
delta[45,1]
delta[45,2]
delta[45,3]
delta[6,1]
delta[6,2]
delta[6,3]
delta[8,1]
delta[8,2]
delta[8,3]

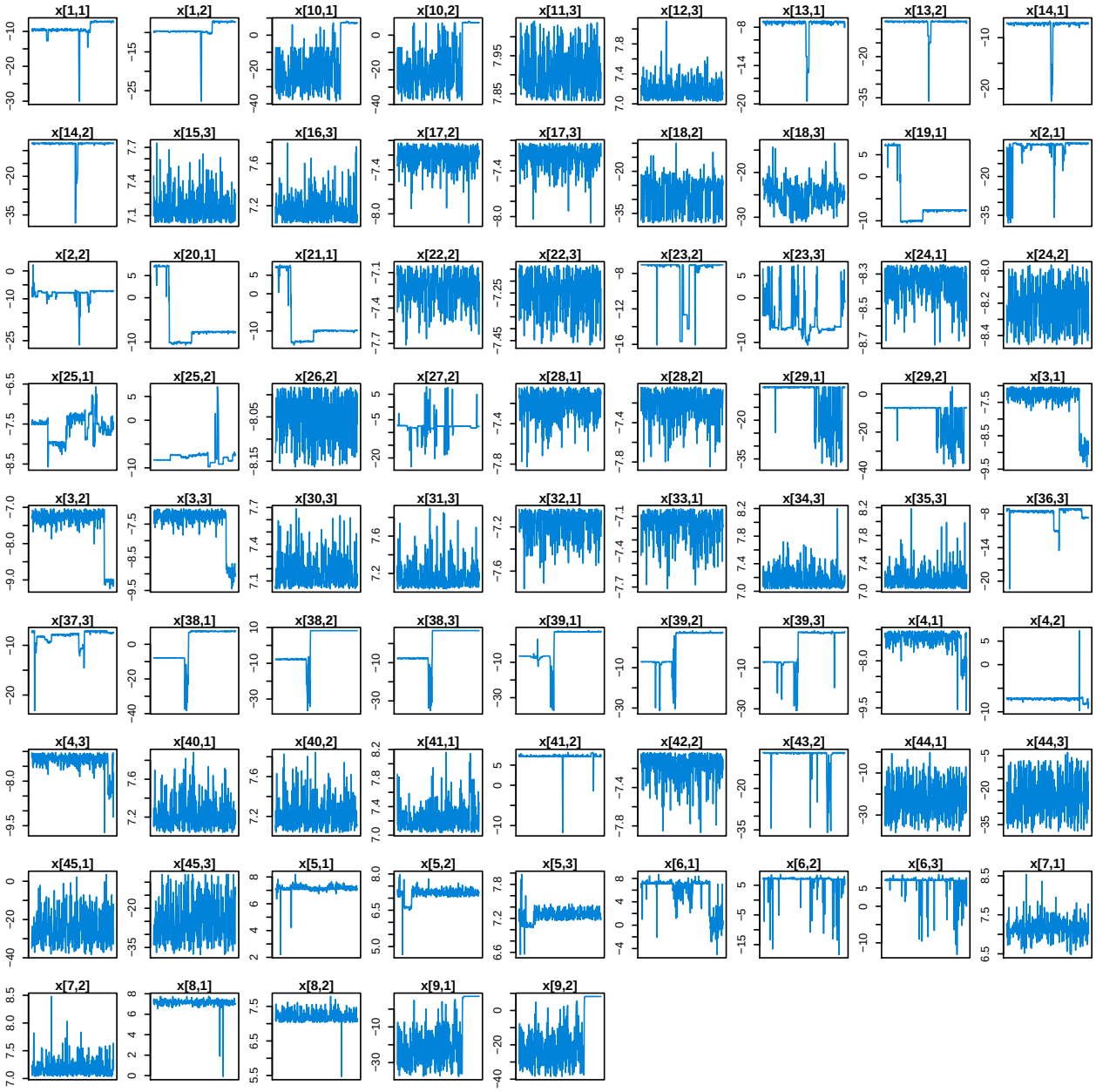
d (pooled treatment effects across trials)




d[1,1]
d[1,2]
d[1,3]
d[2,1]
d[2,2]
d[2,3]
d[3,1]
d[3,2]
d[3,3]
d[4,1]
d[4,2]
d[4,3]
d[5,1]
d[5,2]
d[5,3]
d[6,1]
d[6,2]
d[6,3]
d[7,1]
d[7,2]
d[7,3]
d[8,1]
d[8,2]
d[8,3]
d[9,1]
d[9,2]
d[9,3]

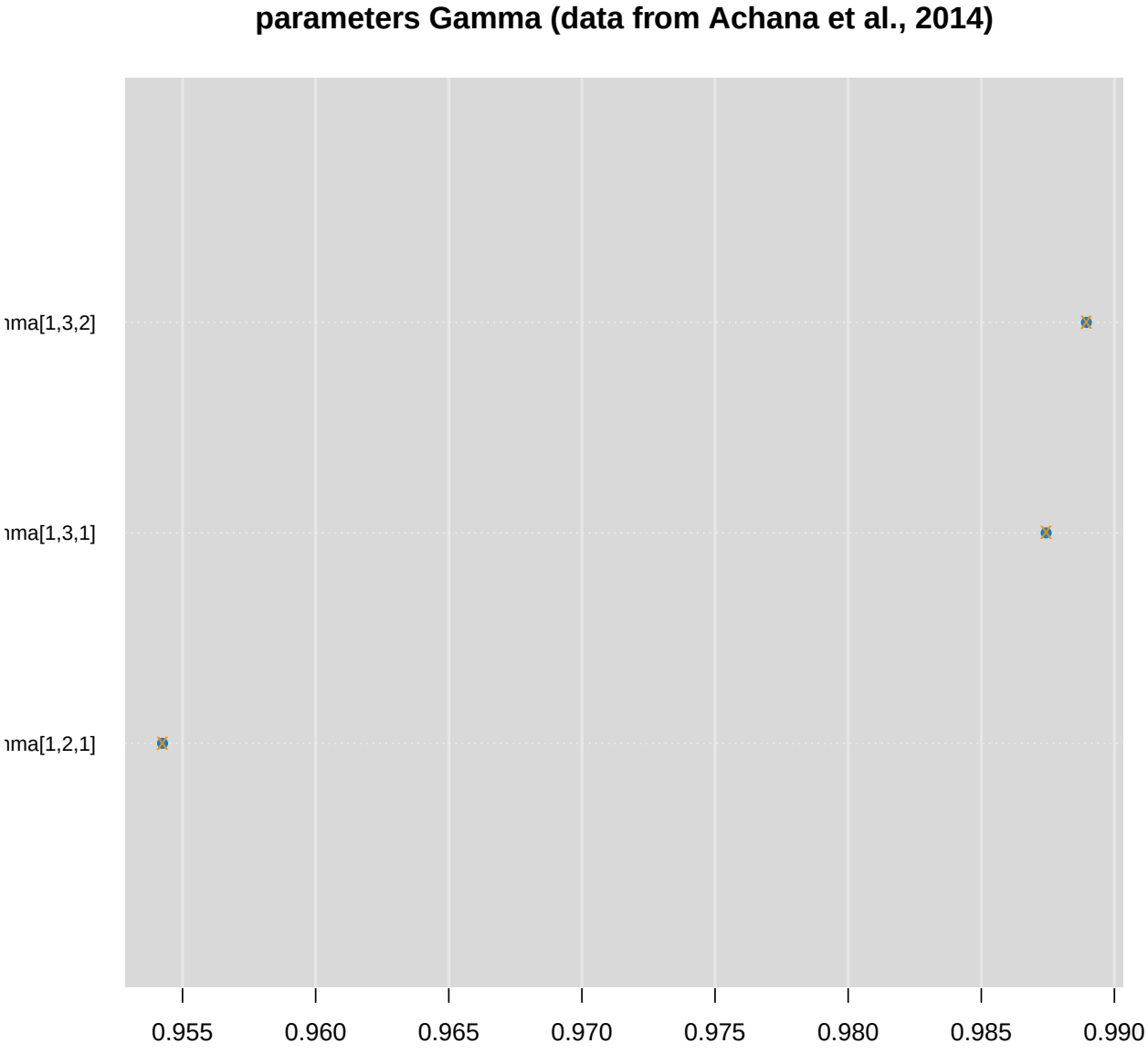
$\boldsymbol{x}$ (latent variables)

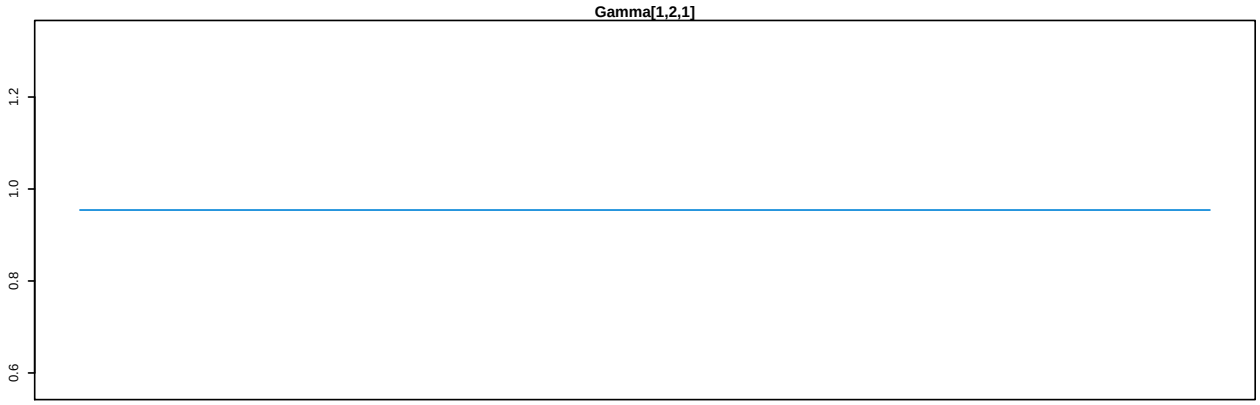


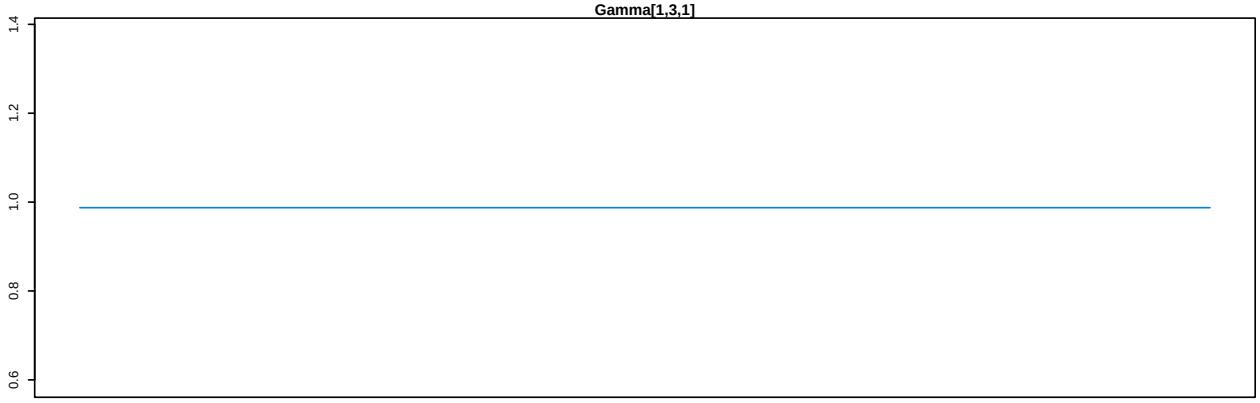

x[1,1]
x[1,2]
x[10,1]
x[10,2]
x[11,3]
x[12,3]
x[13,1]
x[13,2]
x[14,1]
x[14,2]
x[15,3]
x[16,3]
x[17,2]
x[17,3]
x[18,2]
x[18,3]
x[19,1]
x[2,1]
x[2,2]
x[20,1]
x[21,1]
x[22,2]
x[22,3]
x[23,2]
x[23,3]
x[24,1]
x[24,2]
x[25,1]
x[25,2]
x[26,2]
x[27,2]
x[28,1]
x[28,2]
x[29,1]
x[29,2]
x[3,1]
x[3,2]
x[3,3]
x[30,3]
x[31,3]
x[32,1]
x[33,1]
x[34,3]
x[35,3]
x[36,3]
x[37,3]
x[38,1]
x[38,2]
x[38,3]
x[39,1]
x[39,2]
x[39,3]
x[4,1]
x[4,2]
x[4,3]
x[40,1]
x[40,2]
x[41,1]
x[41,2]
x[42,2]
x[43,2]
x[44,1]
x[44,3]
x[45,1]
x[45,3]
x[5,1]
x[5,2]
x[5,3]
x[6,1]
x[6,2]
x[6,3]
x[7,1]
x[7,2]
x[8,1]
x[8,2]
x[9,1]
x[9,2]

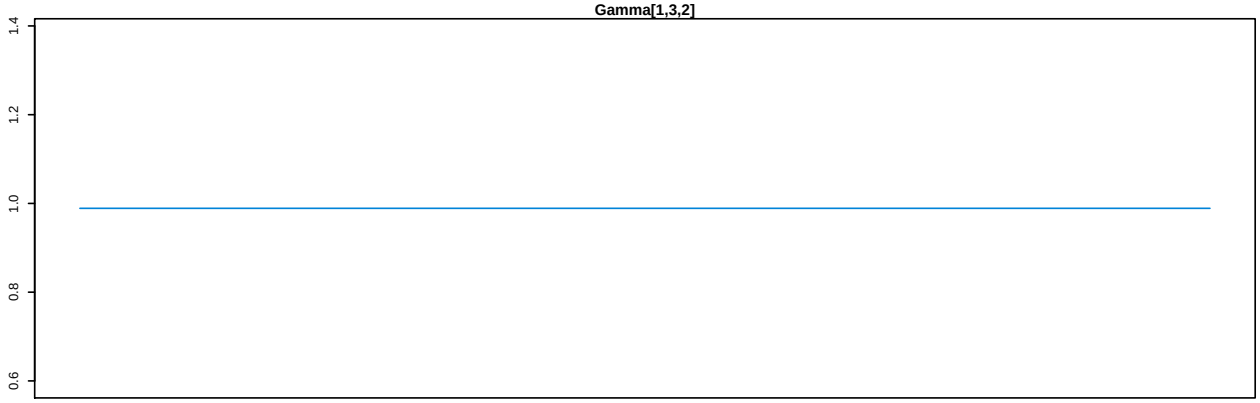
Γ estimated – μ and δ unconstrained

Γ (outcome copula correlation matrix)

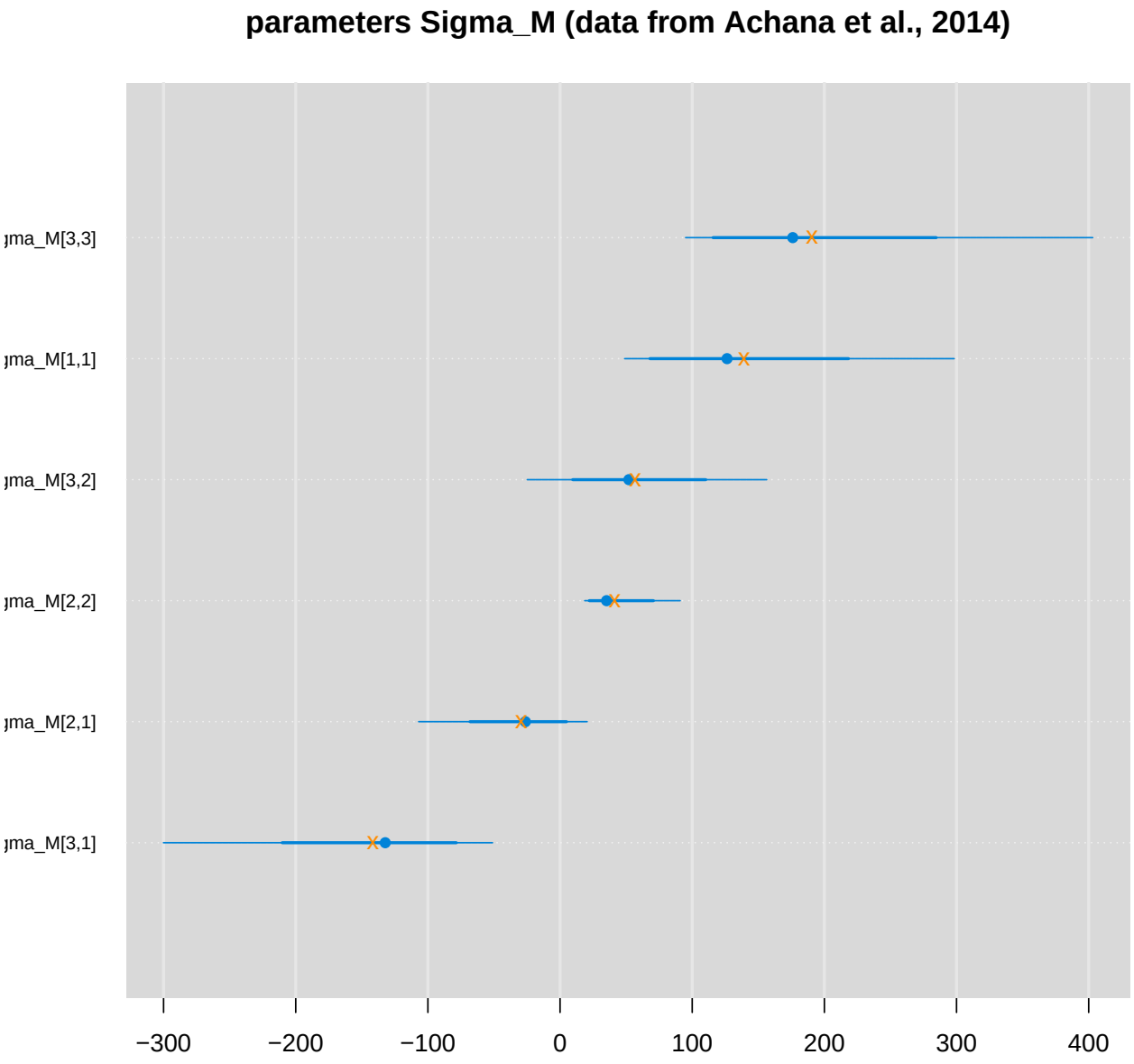


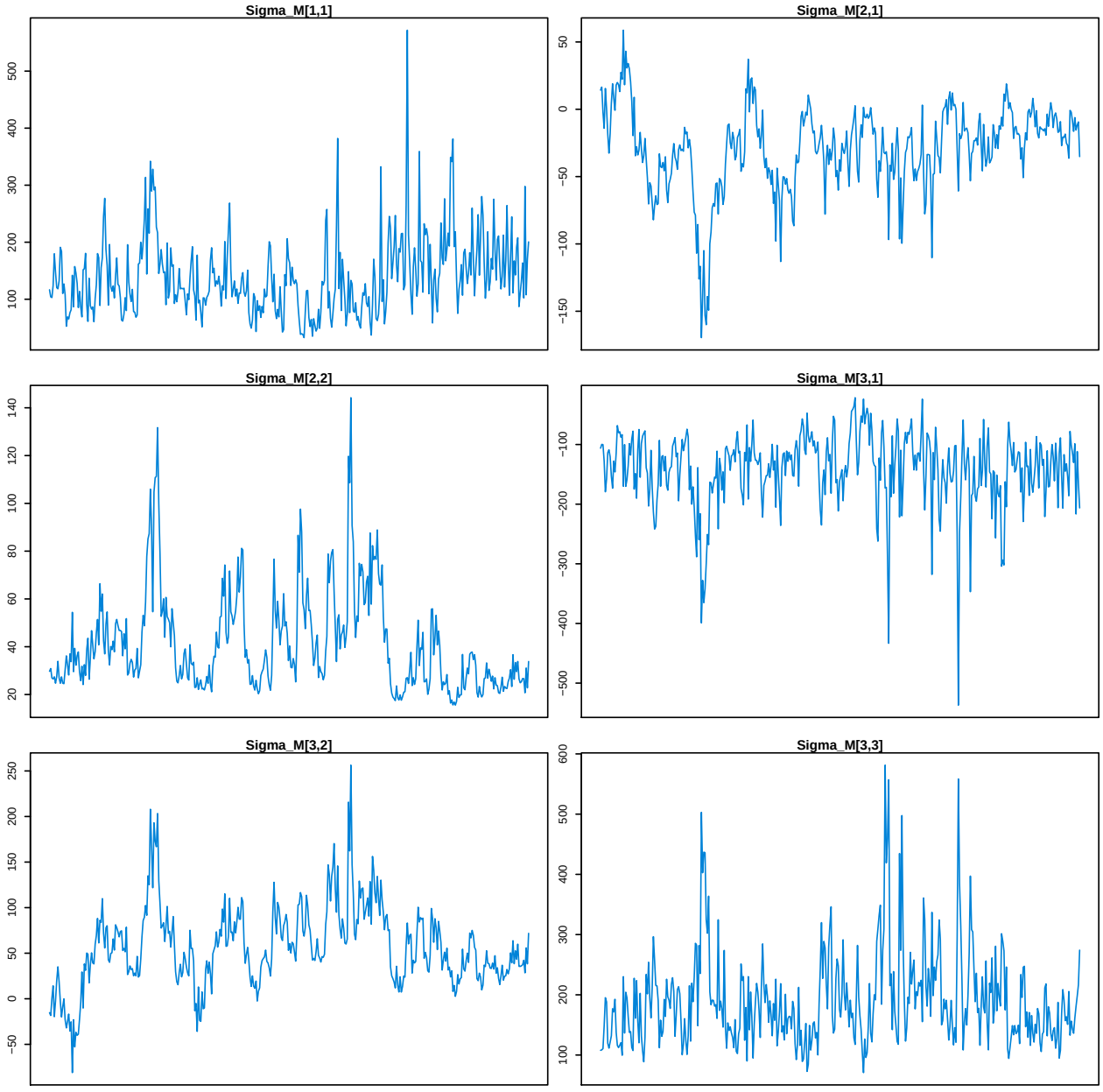

Gamma[1,2,1]
1.2
1.0
0.8
0.6

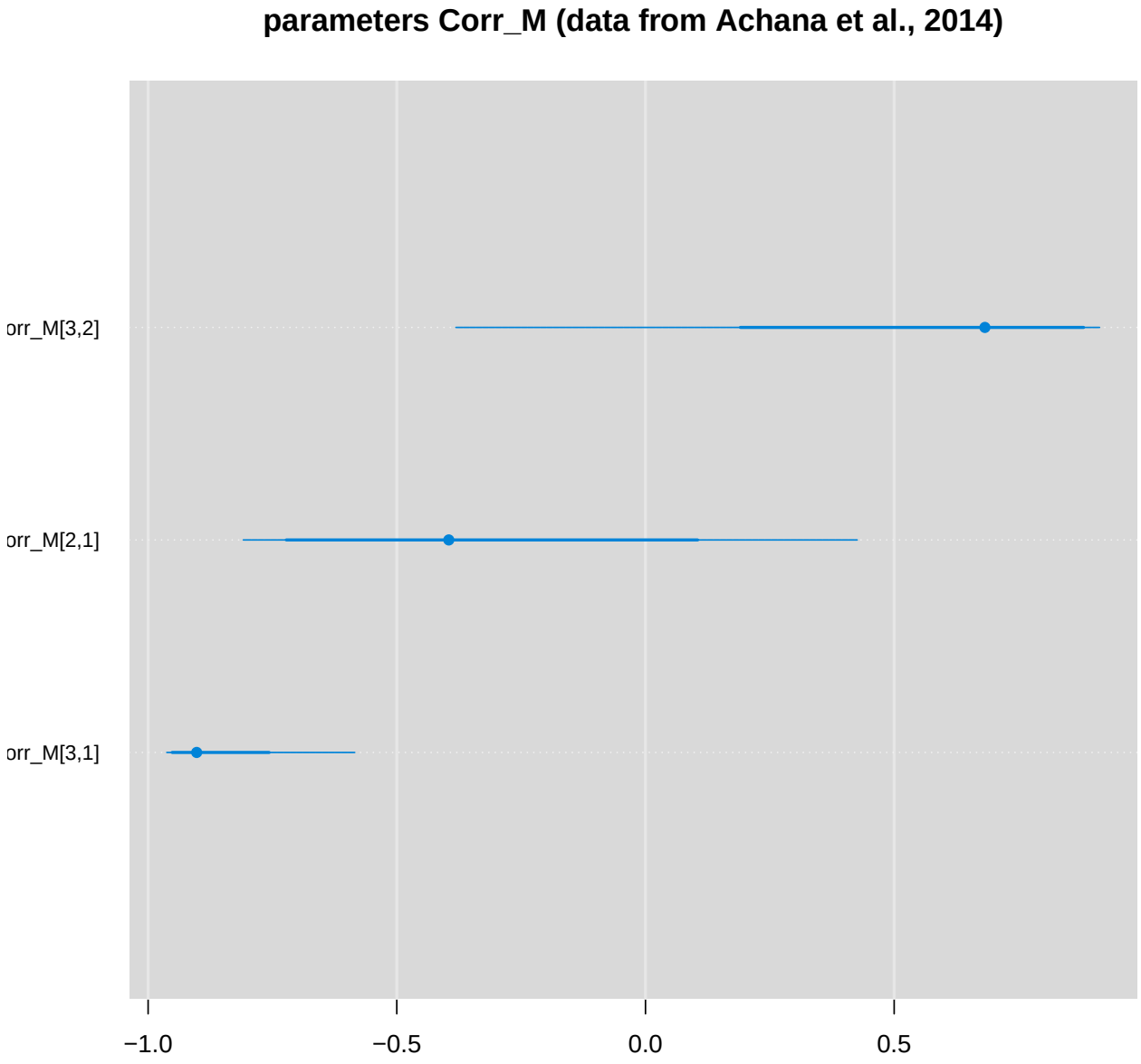

Gamma[1,3,1]
1.4
1.2
1.0
0.8
0.6

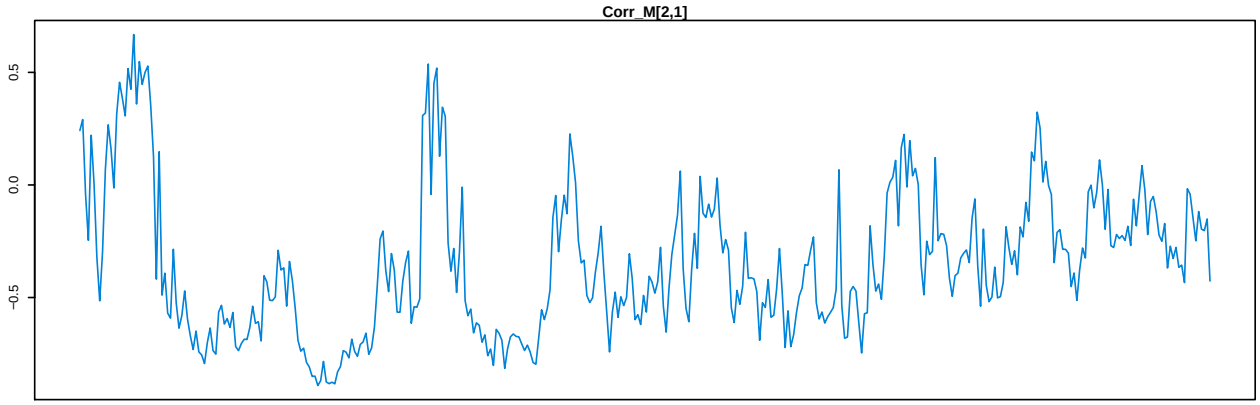

Gamma[1,3,2]
1.4
1.2
1.0
0.8
0.6

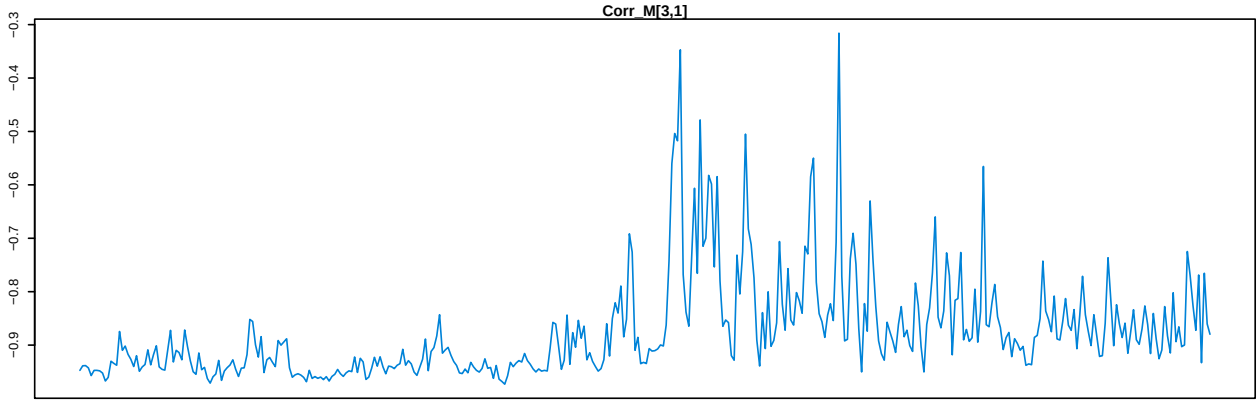
$\boldsymbol{\Sigma_M}$ **(common between-study covariance structure)**

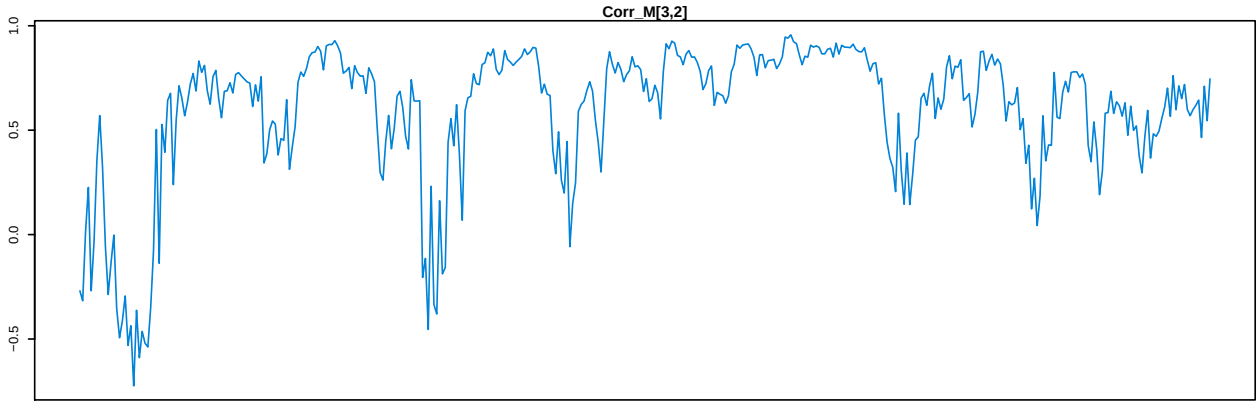



Sigma_M[1,1]
Sigma_M[2,1]
Sigma_M[2,2]
Sigma_M[3,1]
Sigma_M[3,2]
Sigma_M[3,3]

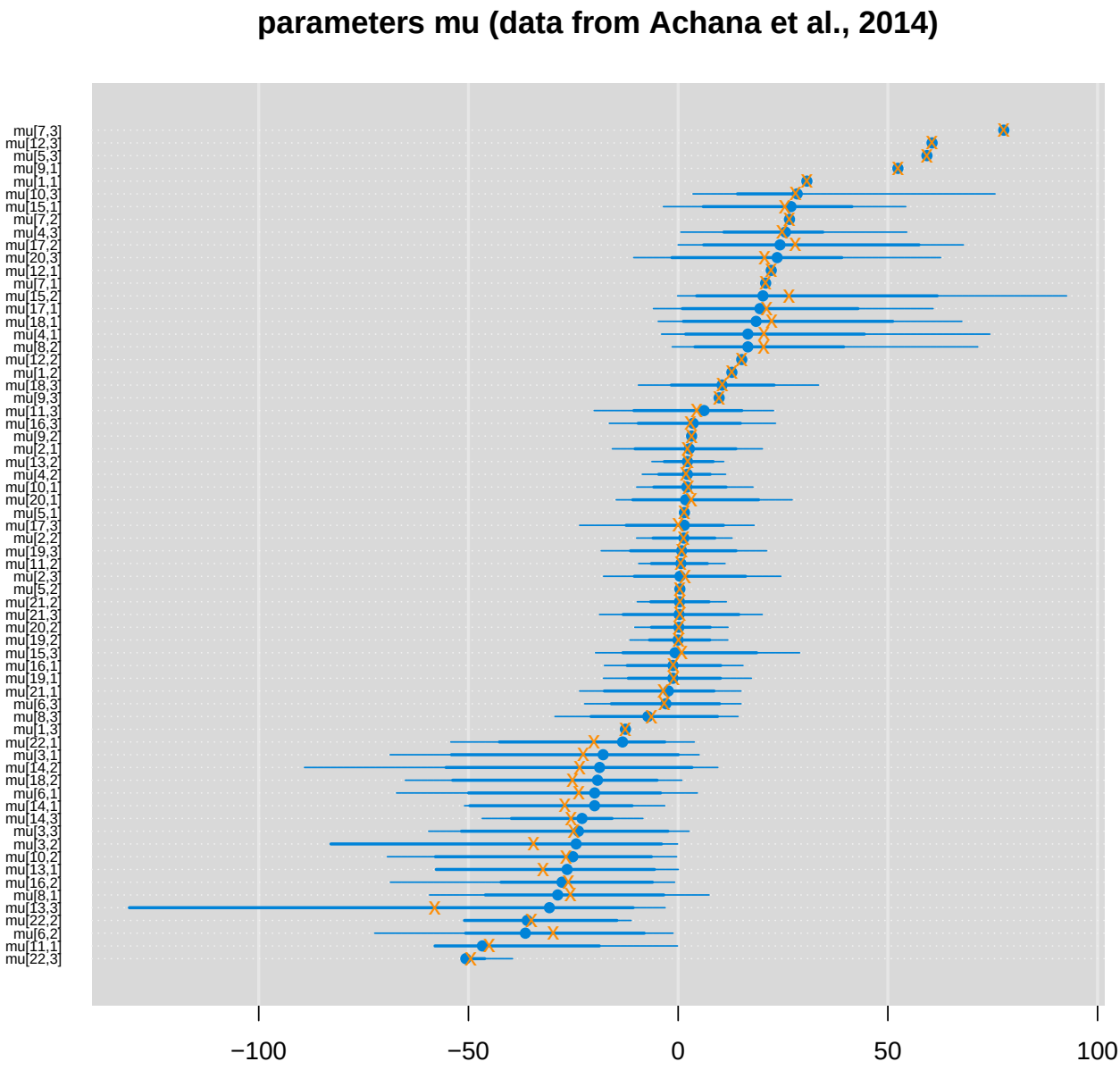

parameters Corr_M (data from Achana et al., 2014)
orr_M[3,2]
orr_M[2,1]
orr_M[3,1]
−1.0
−0.5
0.0
0.5

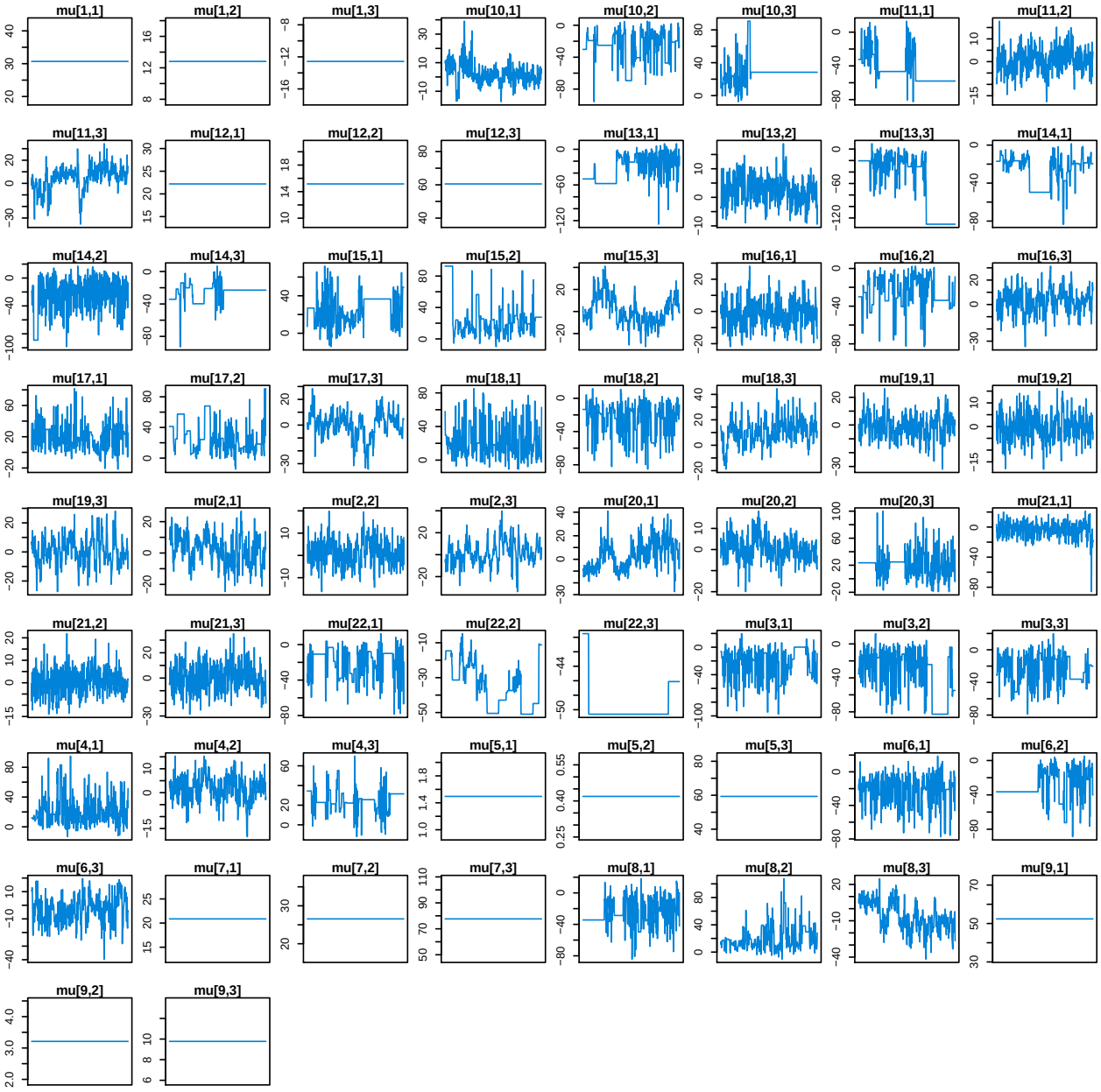

Corr_M[2,1]
0.5
0.0
−0.5


Corr_M[3,1]
−0.3
−0.4
−0.5
−0.6
−0.7
−0.8
−0.9

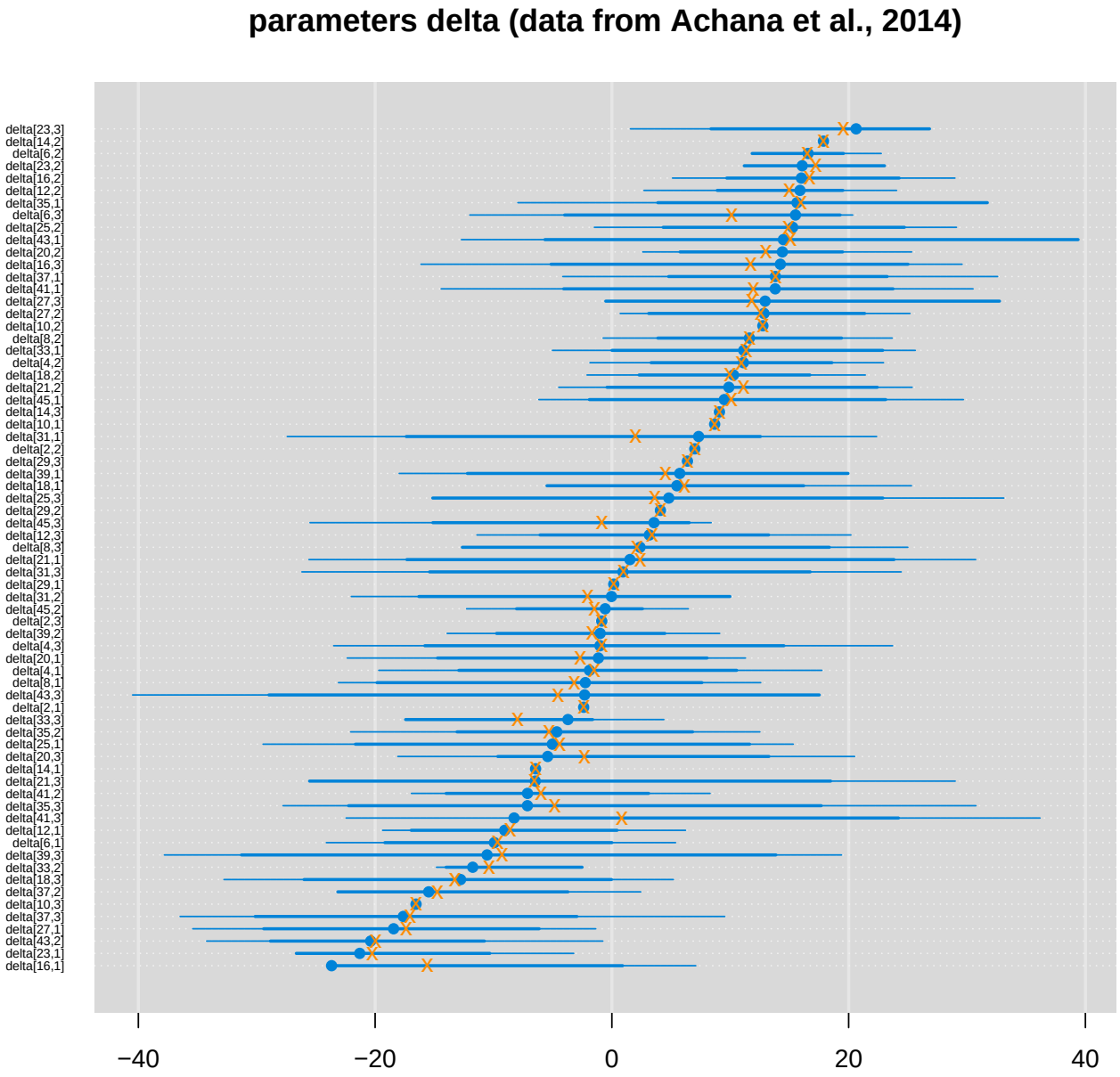

Corr_M[3,2]
1.0
0.5
0.0
−0.5

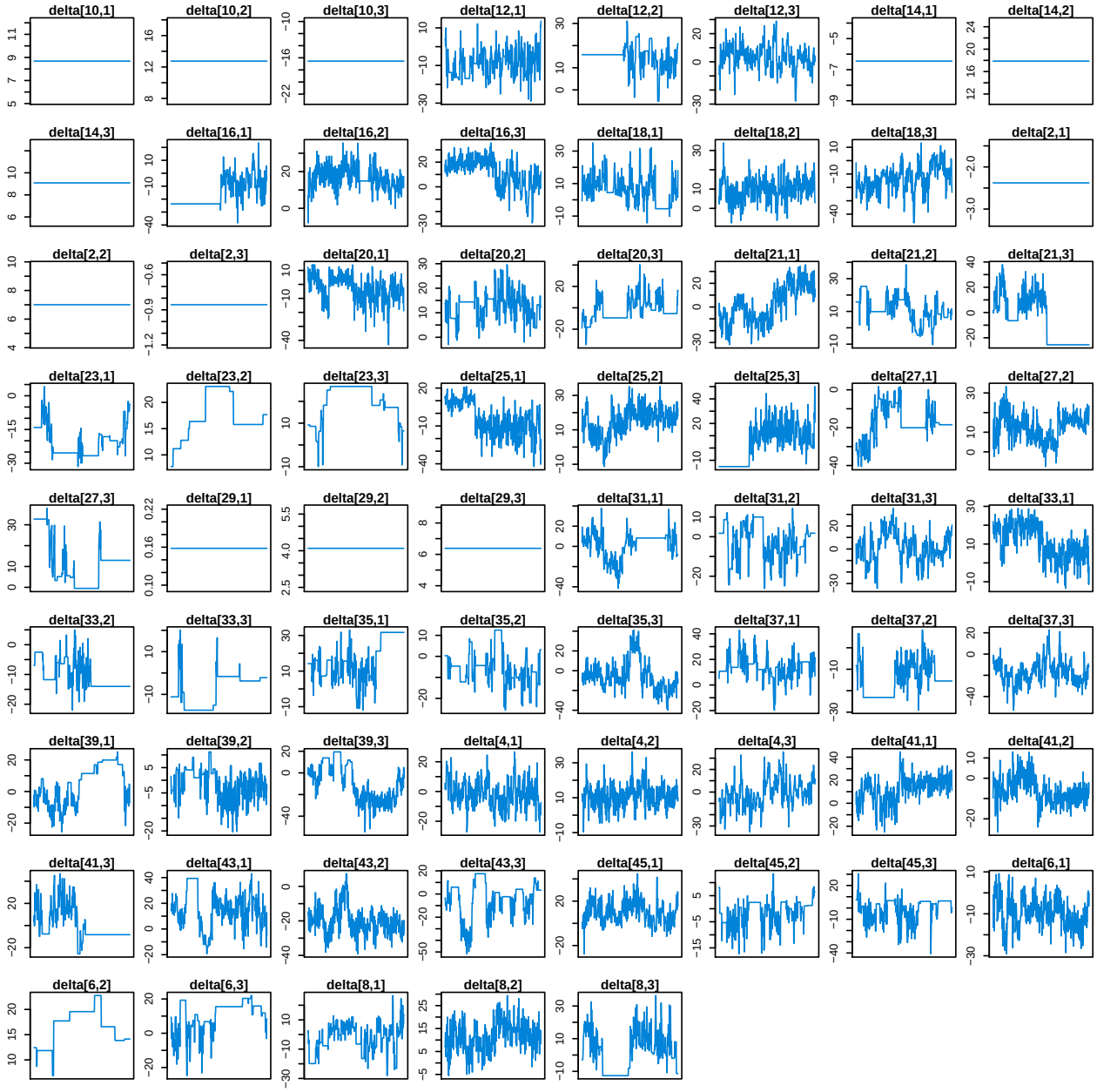
μ (study-specific baseline effects)



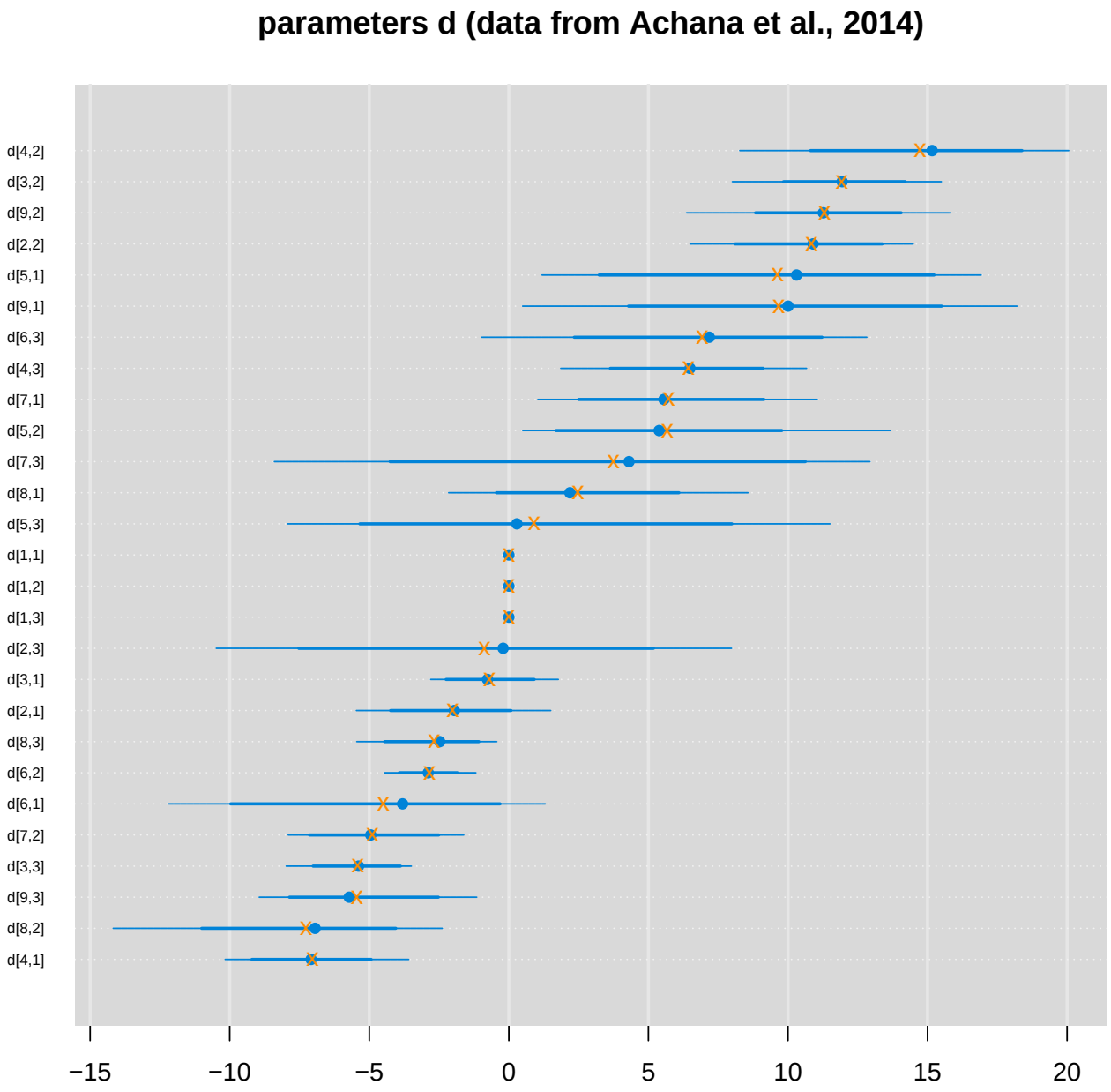

mu[1,1]
mu[1,2]
mu[1,3]
mu[10,1]
mu[10,2]
mu[10,3]
mu[11,1]
mu[11,2]
mu[11,3]
mu[12,1]
mu[12,2]
mu[12,3]
mu[13,1]
mu[13,2]
mu[13,3]
mu[14,1]
mu[14,2]
mu[14,3]
mu[15,1]
mu[15,2]
mu[15,3]
mu[16,1]
mu[16,2]
mu[16,3]
mu[17,1]
mu[17,2]
mu[17,3]
mu[18,1]
mu[18,2]
mu[18,3]
mu[19,1]
mu[19,2]
mu[19,3]
mu[2,1]
mu[2,2]
mu[2,3]
mu[20,1]
mu[20,2]
mu[20,3]
mu[21,1]
mu[21,2]
mu[21,3]
mu[22,1]
mu[22,2]
mu[22,3]
mu[3,1]
mu[3,2]
mu[3,3]
mu[4,1]
mu[4,2]
mu[4,3]
mu[5,1]
mu[5,2]
mu[5,3]
mu[6,1]
mu[6,2]
mu[6,3]
mu[7,1]
mu[7,2]
mu[7,3]
mu[8,1]
mu[8,2]
mu[8,3]
mu[9,1]
mu[9,2]
mu[9,3]

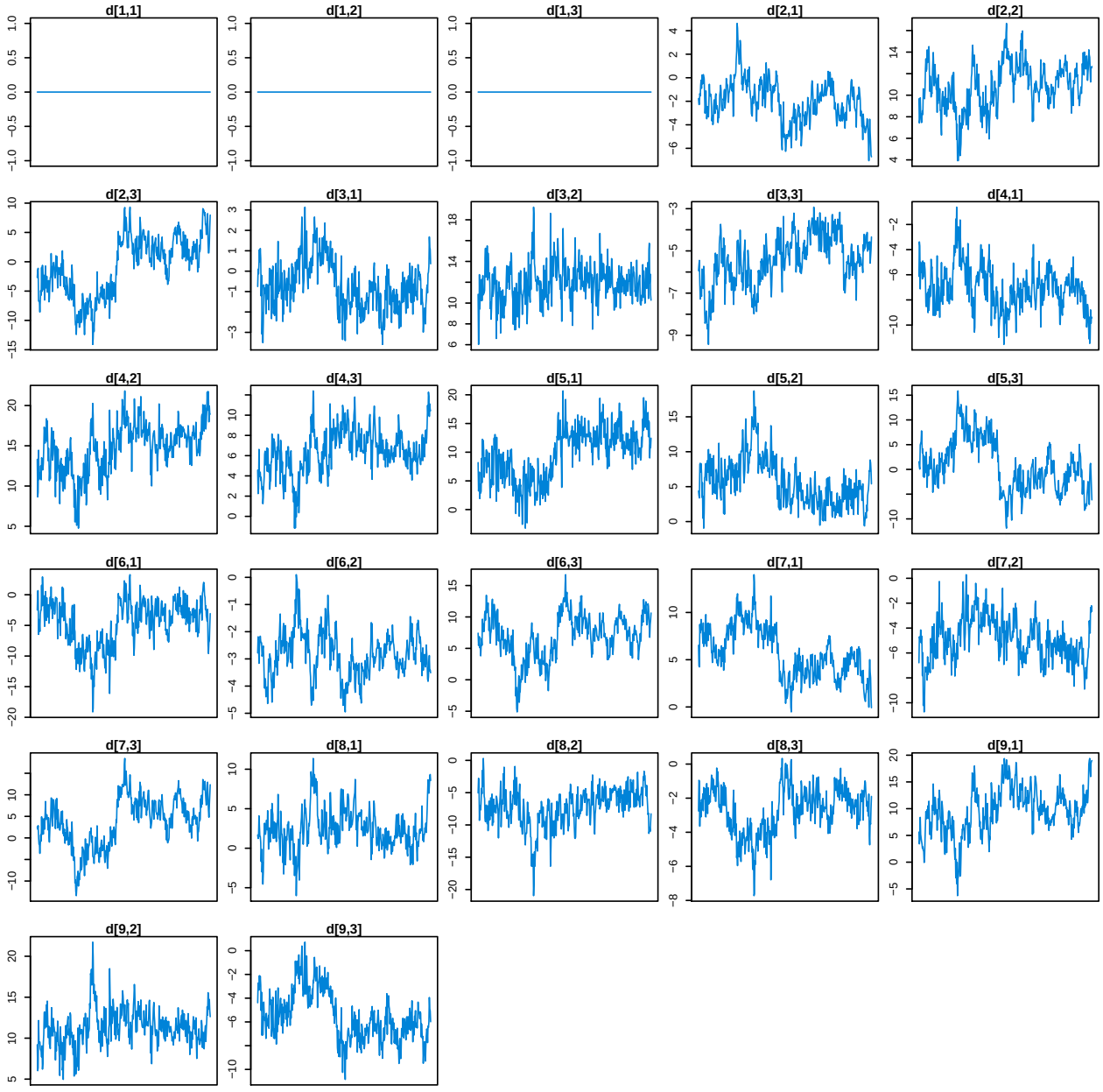
δ (study-specific [random] treatment effects)



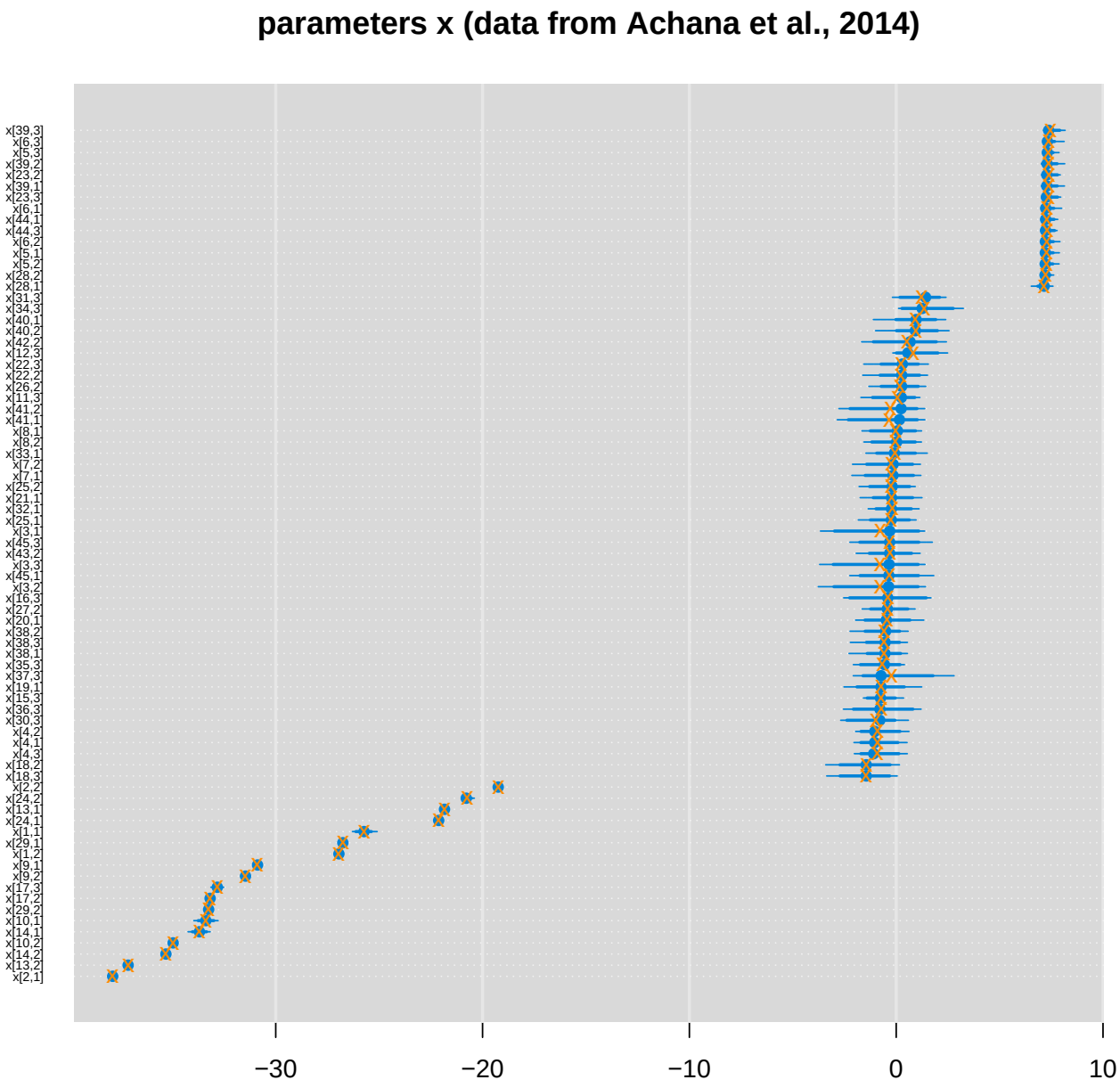

delta[10,1]
delta[10,2]
delta[10,3]
delta[12,1]
delta[12,2]
delta[12,3]
delta[14,1]
delta[14,2]
delta[14,3]
delta[16,1]
delta[16,2]
delta[16,3]
delta[18,1]
delta[18,2]
delta[18,3]
delta[2,1]
delta[2,2]
delta[2,3]
delta[20,1]
delta[20,2]
delta[20,3]
delta[21,1]
delta[21,2]
delta[21,3]
delta[23,1]
delta[23,2]
delta[23,3]
delta[25,1]
delta[25,2]
delta[25,3]
delta[27,1]
delta[27,2]
delta[27,3]
delta[29,1]
delta[29,2]
delta[29,3]
delta[31,1]
delta[31,2]
delta[31,3]
delta[33,1]
delta[33,2]
delta[33,3]
delta[35,1]
delta[35,2]
delta[35,3]
delta[37,1]
delta[37,2]
delta[37,3]
delta[39,1]
delta[39,2]
delta[39,3]
delta[4,1]
delta[4,2]
delta[4,3]
delta[41,1]
delta[41,2]
delta[41,3]
delta[43,1]
delta[43,2]
delta[43,3]
delta[45,1]
delta[45,2]
delta[45,3]
delta[6,1]
delta[6,2]
delta[6,3]
delta[8,1]
delta[8,2]
delta[8,3]

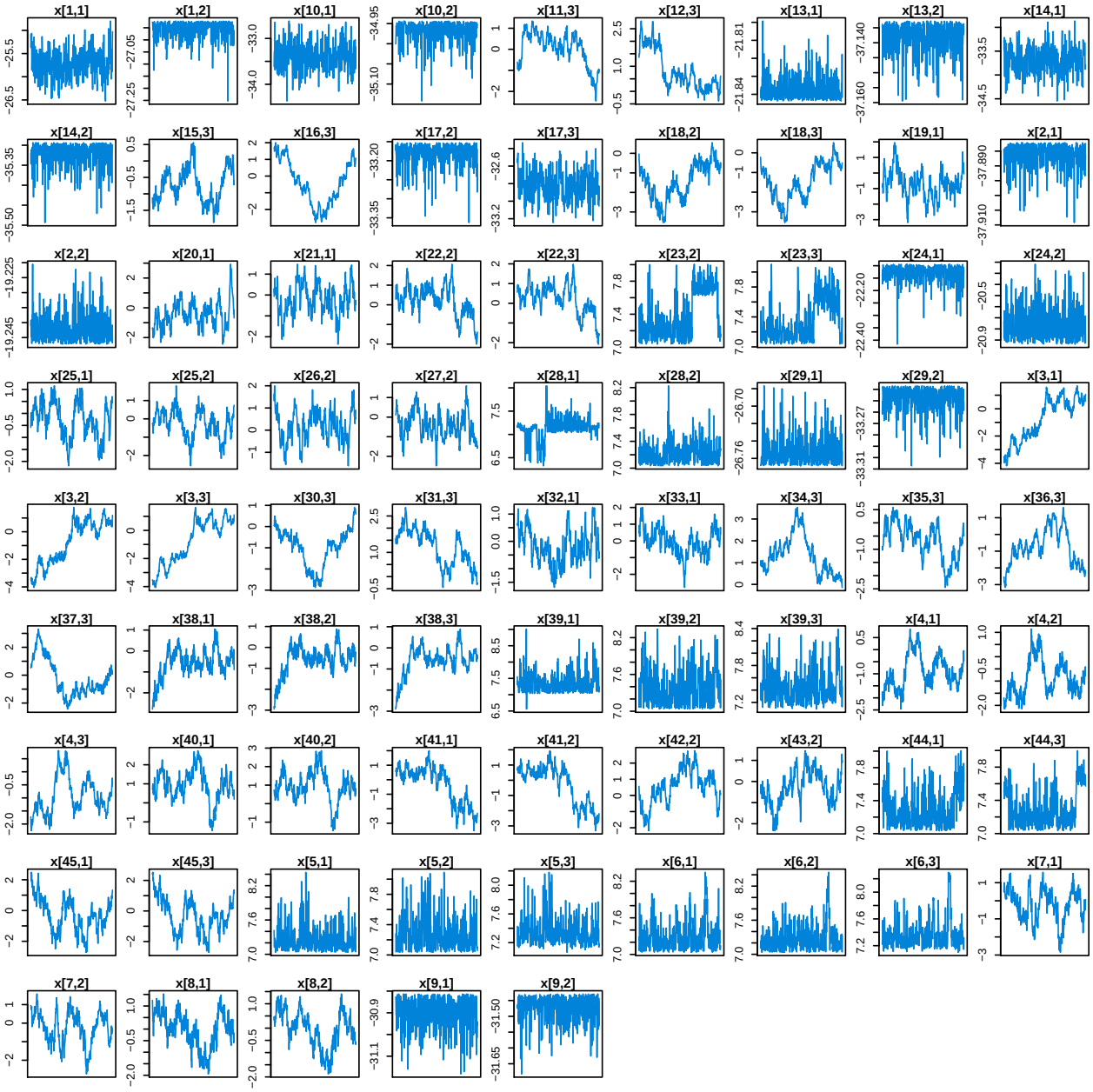
d (pooled treatment effects across trials)




d[1,1]
d[1,2]
d[1,3]
d[2,1]
d[2,2]
d[2,3]
d[3,1]
d[3,2]
d[3,3]
d[4,1]
d[4,2]
d[4,3]
d[5,1]
d[5,2]
d[5,3]
d[6,1]
d[6,2]
d[6,3]
d[7,1]
d[7,2]
d[7,3]
d[8,1]
d[8,2]
d[8,3]
d[9,1]
d[9,2]
d[9,3]

$\boldsymbol{x}$ (latent variables)




x[1,1]
x[1,2]
x[10,1]
x[10,2]
x[11,3]
x[12,3]
x[13,1]
x[13,2]
x[14,1]
x[14,2]
x[15,3]
x[16,3]
x[17,2]
x[17,3]
x[18,2]
x[18,3]
x[19,1]
x[2,1]
x[2,2]
x[20,1]
x[21,1]
x[22,2]
x[22,3]
x[23,2]
x[23,3]
x[24,1]
x[24,2]
x[25,1]
x[25,2]
x[26,2]
x[27,2]
x[28,1]
x[28,2]
x[29,1]
x[29,2]
x[3,1]
x[3,2]
x[3,3]
x[30,3]
x[31,3]
x[32,1]
x[33,1]
x[34,3]
x[35,3]
x[36,3]
x[37,3]
x[38,1]
x[38,2]
x[38,3]
x[39,1]
x[39,2]
x[39,3]
x[4,1]
x[4,2]
x[4,3]
x[40,1]
x[40,2]
x[41,1]
x[41,2]
x[42,2]
x[43,2]
x[44,1]
x[44,3]
x[45,1]
x[45,3]
x[5,1]
x[5,2]
x[5,3]
x[6,1]
x[6,2]
x[6,3]
x[7,1]
x[7,2]
x[8,1]
x[8,2]
x[9,1]
x[9,2]