P2 Simulation Results

George G Vega Yon

Sep 27, 2018

Intro

- Took the first 2,000 trees from panther
- Ran 4 types of models:
  1. Gold Standard (no missing) `dat ~ psi + eta + mu + Pi`
  2. Missing `dat ~ psi + eta + mu + Pi`
  3. Pub Bias (has missing and publication bias) `dat ~ mu + psi + Pi`
  4. Full model (same as before) `dat ~ psi + eta + mu + Pi`
- Each model ran the MCMCs with the following parameteres:

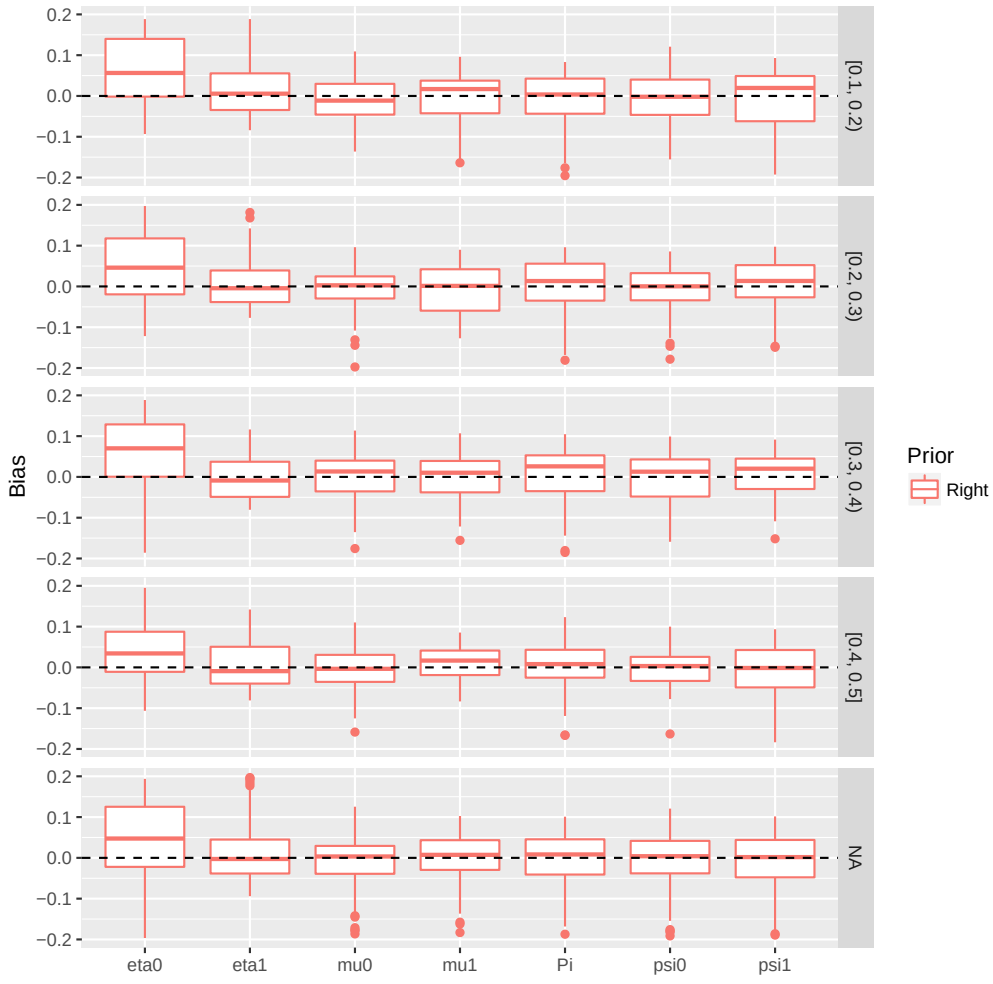
```
mcmc.nbatch  <- 1e5
mcmc.burnin  <- 2e4
mcmc.thin    <- 100
mcmc.nchains <- 4
```

Moreover, each chain now starts from a randomly chosen point.

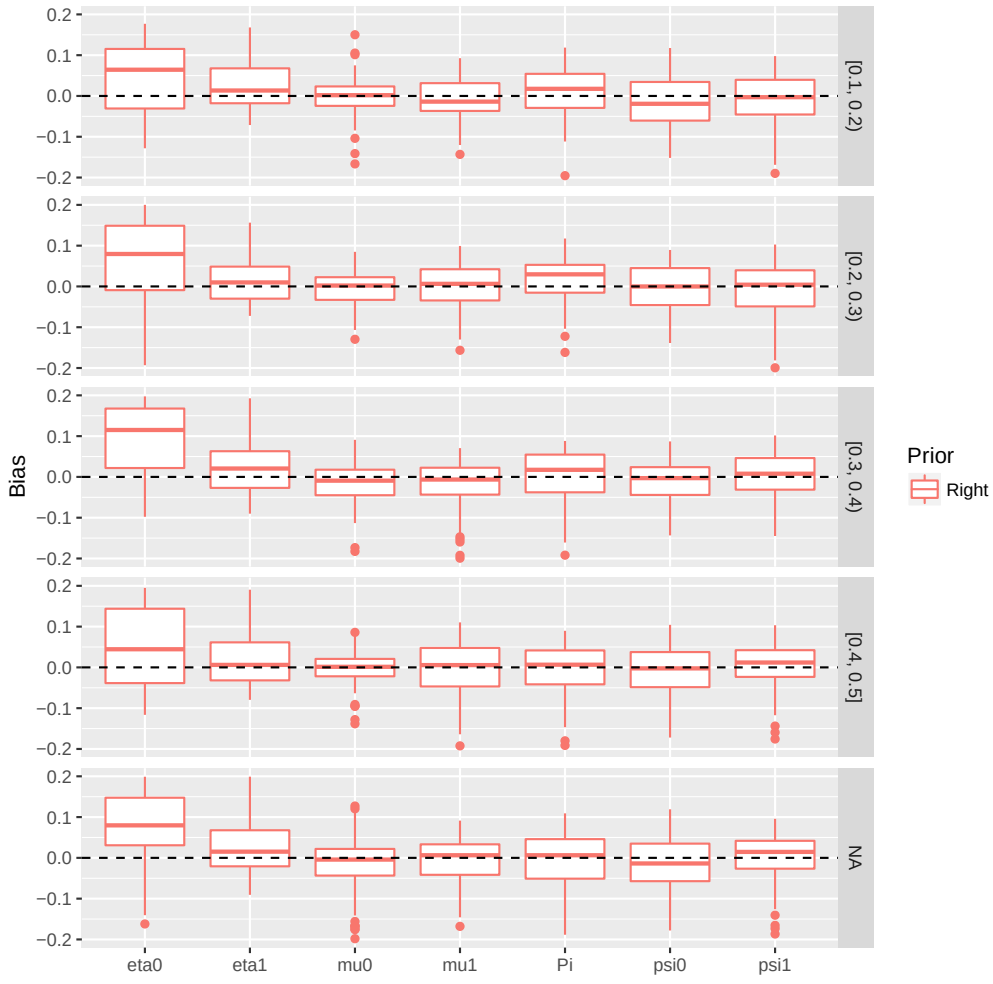
Bias

Contents

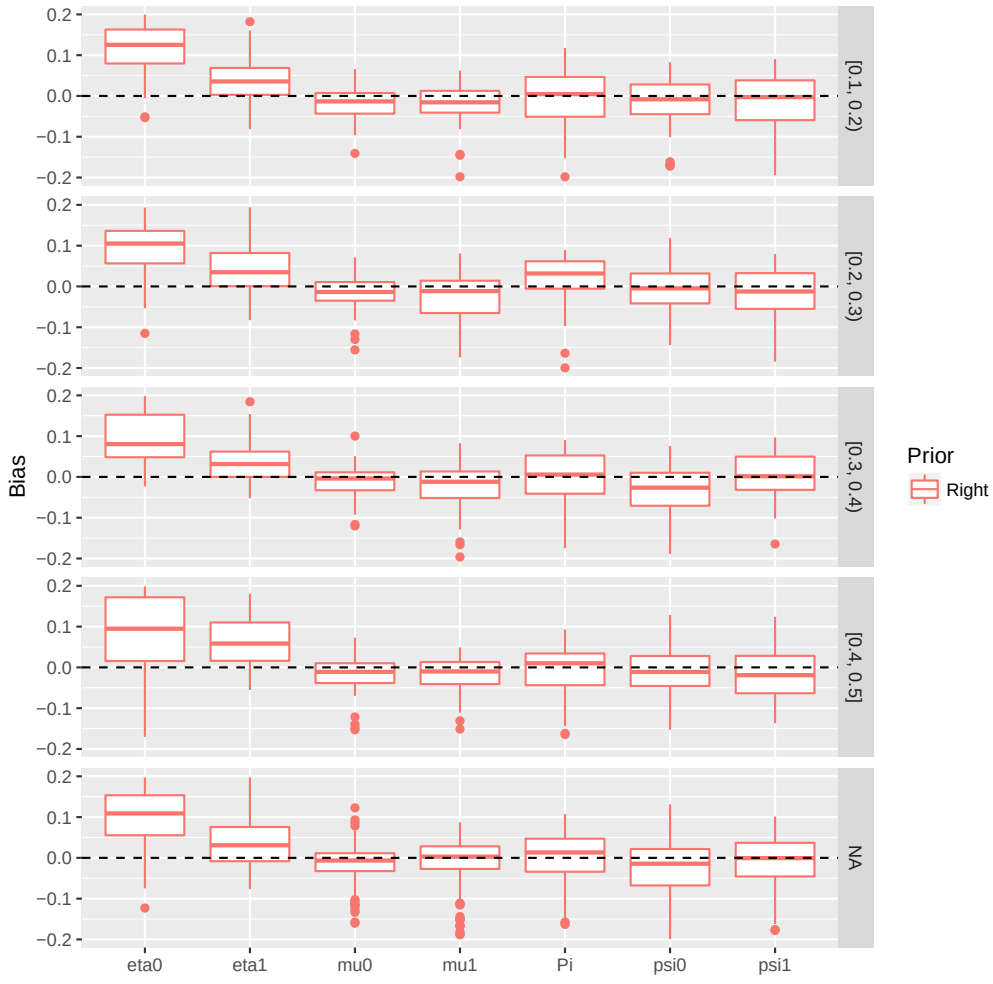
01-gold-standard: Small



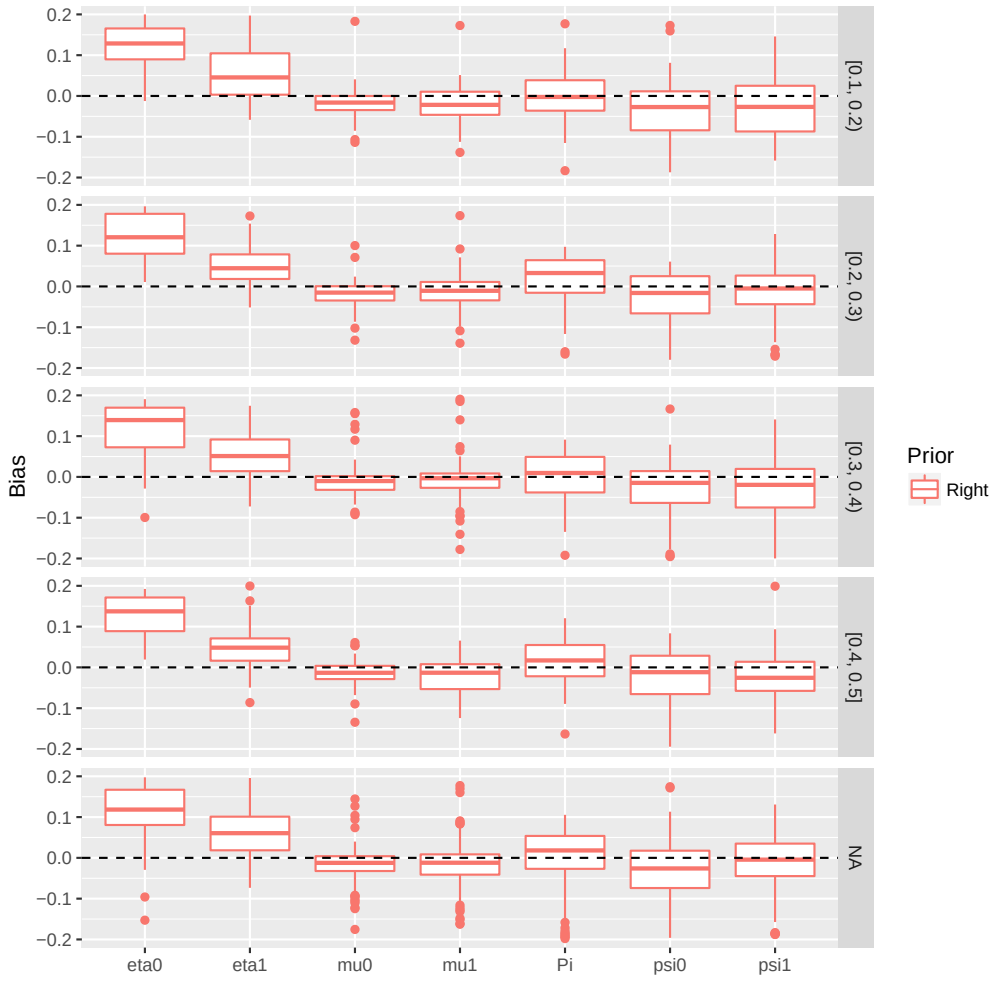
01-gold-standard: Mid-small



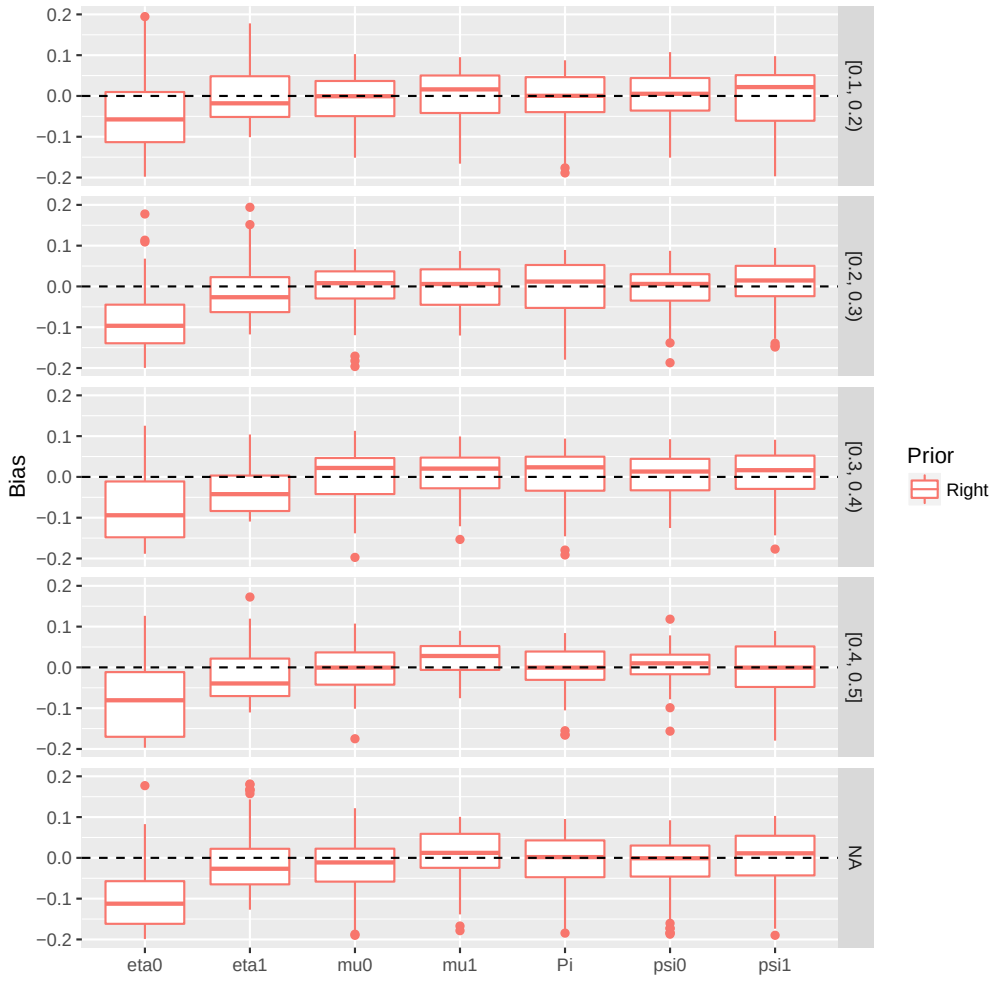
01-gold-standard: Mid-large



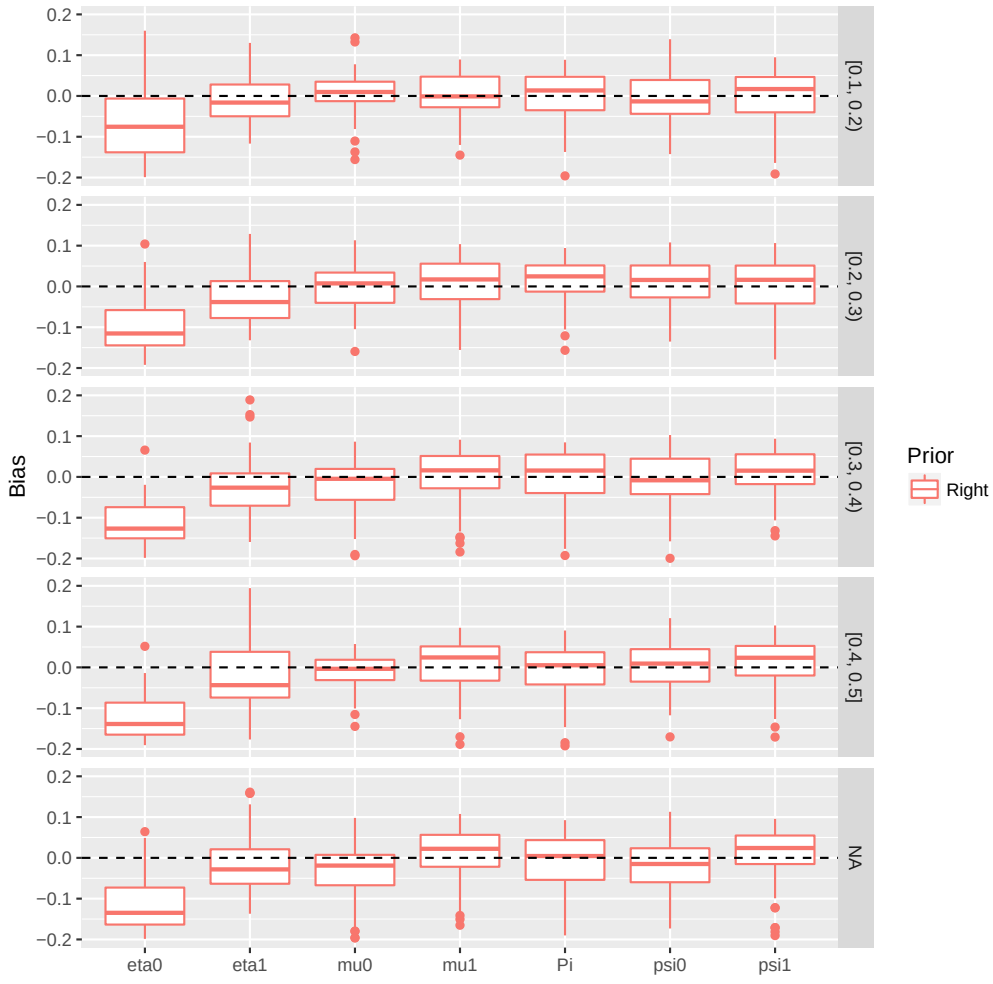
01-gold-standard: Large



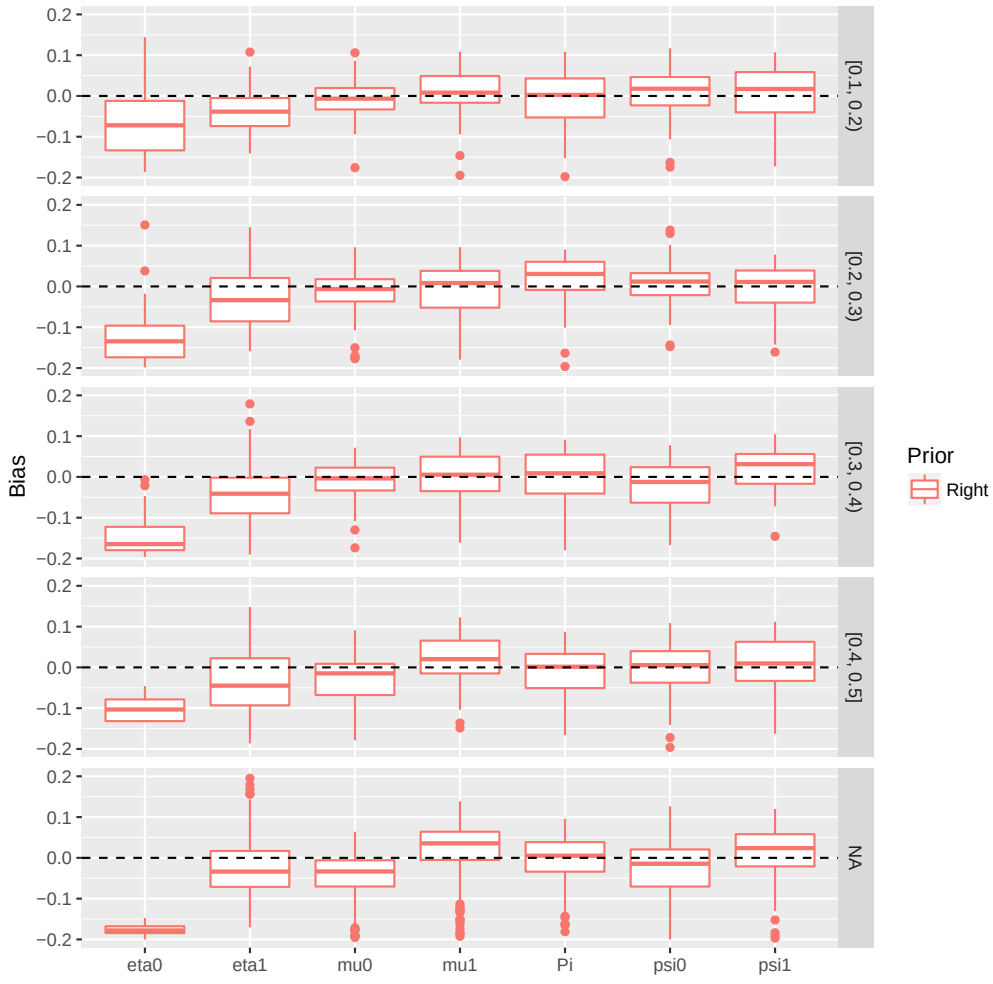
04-full-model: Small



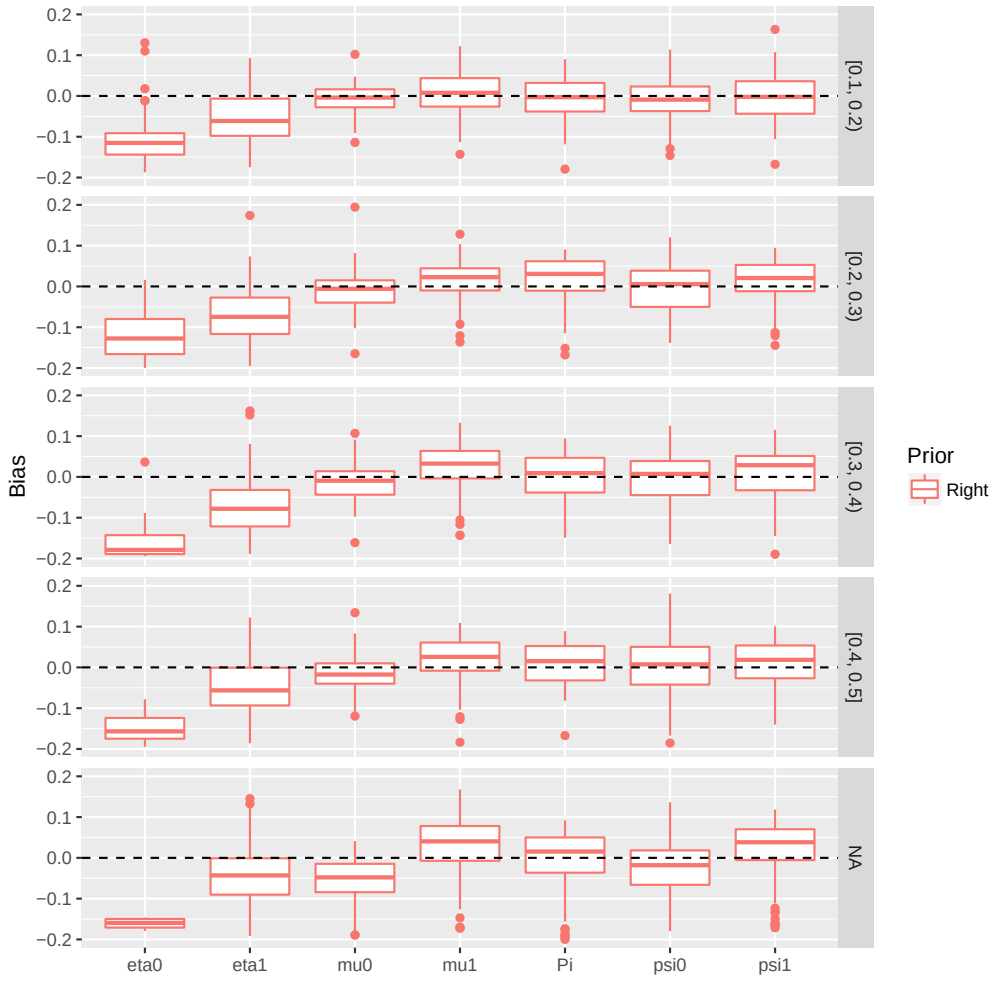
04-full-model: Mid-small



04-full-model: Mid-large



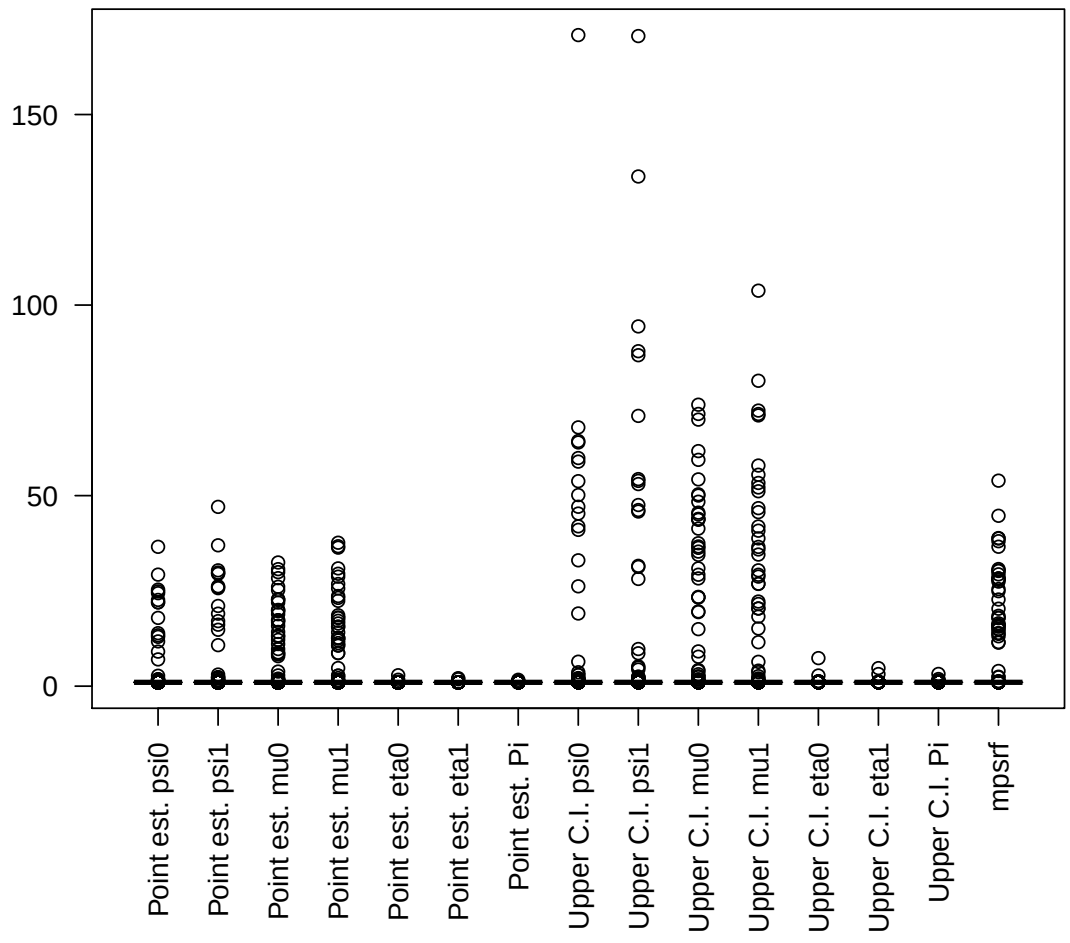
04-full-model: Large



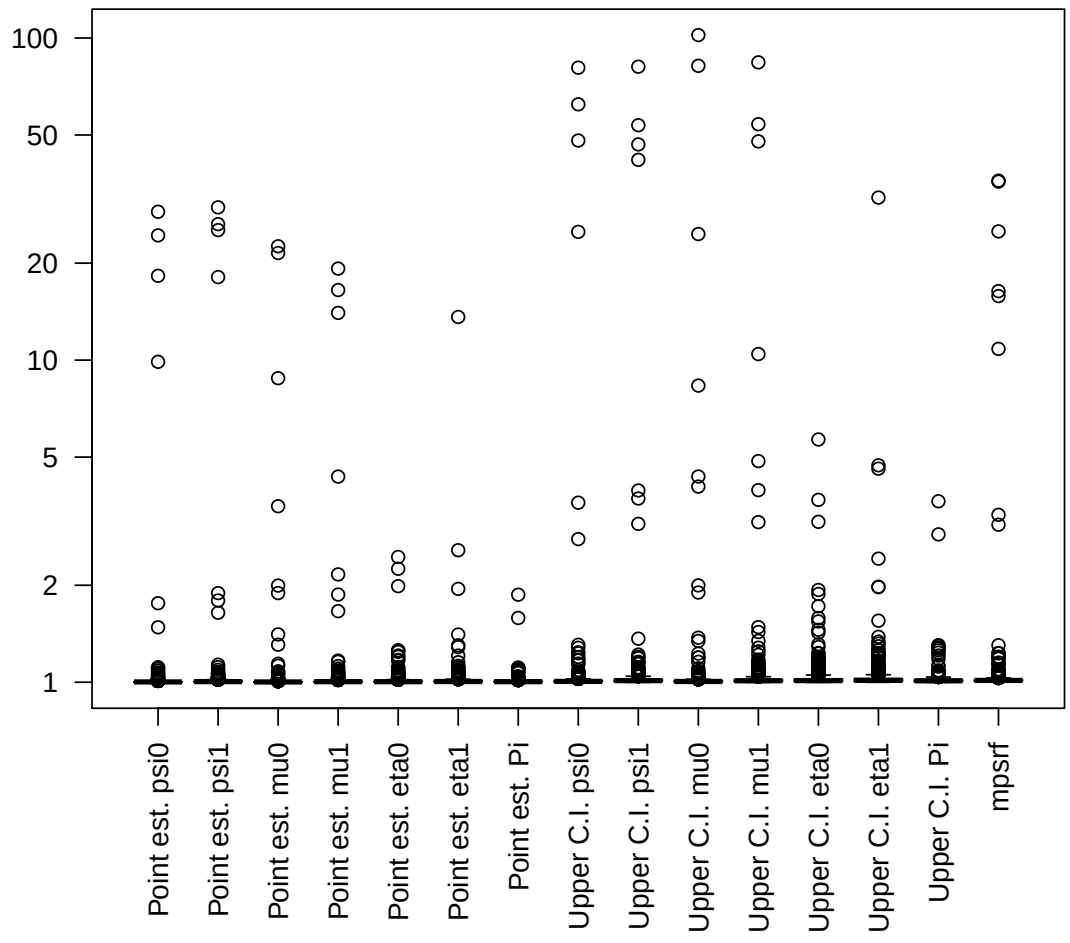
Convergence

Contents

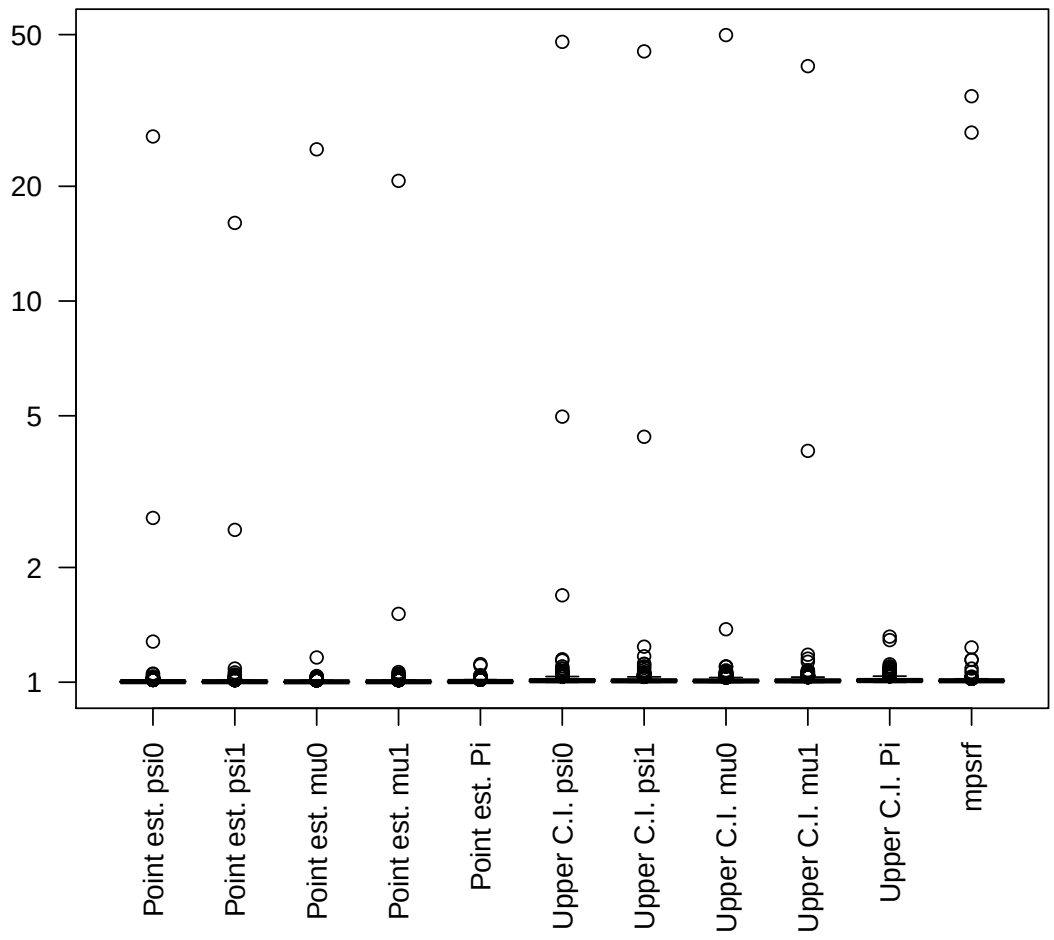
01-gold-standard



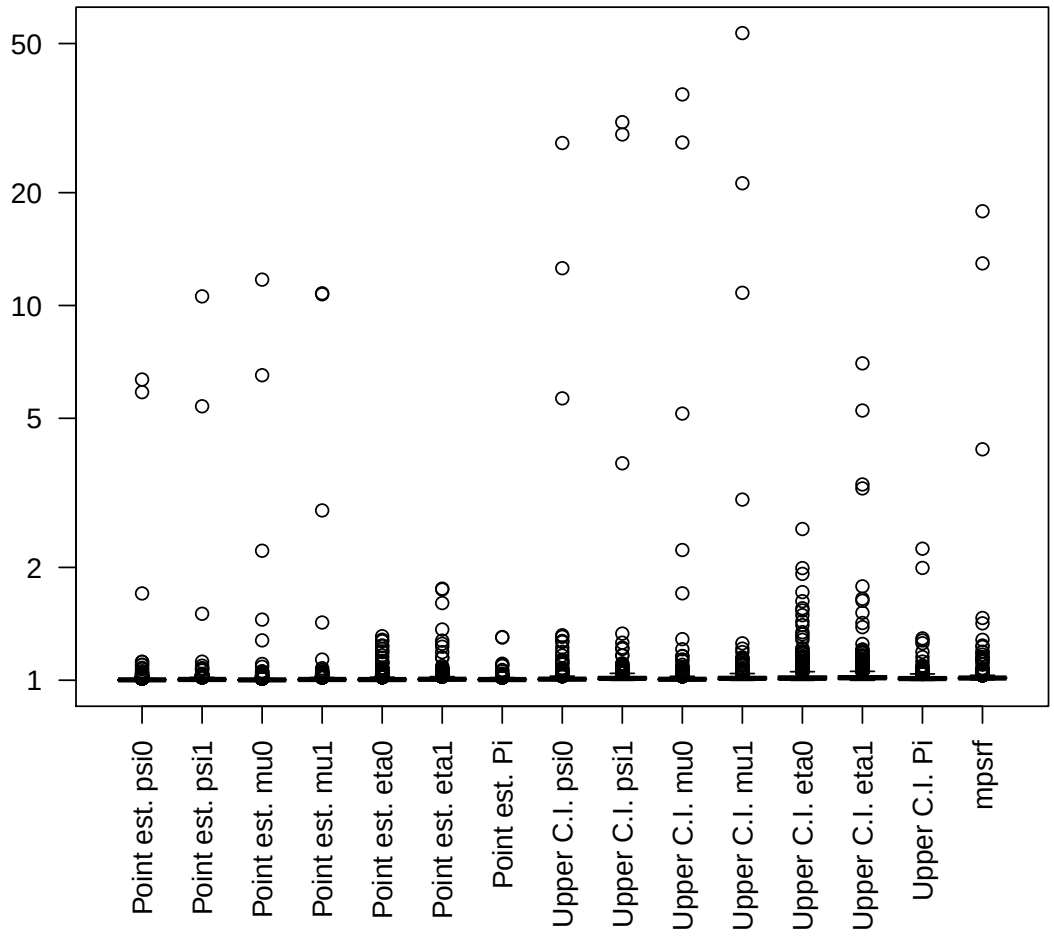
02-missing


100
50
20
10
5
2
1
Point est. psi0
Point est. psi1
Point est. mu0
Point est. mu1
Point est. eta0
Point est. eta1
Point est. Pi
Upper C.I. psi0
Upper C.I. psi1
Upper C.I. mu0
Upper C.I. mu1
Upper C.I. eta0
Upper C.I. eta1
Upper C.I. Pi
mpsrf

03-pub-bias


50
20
10
5
2
1
Point est. psi0
Point est. psi1
Point est. mu0
Point est. mu1
Point est. Pi
Upper C.I. psi0
Upper C.I. psi1
Upper C.I. mu0
Upper C.I. mu1
Upper C.I. Pi
mpsrf

04-full-model



Coverage

Contents

01-gold-standard

Missing	psi0	psi1	mu0	m1	Pi
Right Prior					
[0.1, 0.2)	0.81	0.81	0.93	0.93	0.92
[0.2, 0.3)	0.85	0.87	0.93	0.93	0.93
[0.3, 0.4)	0.79	0.87	0.94	0.94	0.92
[0.4, 0.5]	0.86	0.86	0.95	0.97	0.94
NA	0.81	0.90	0.94	0.95	0.95

Table 1: Coverage probability at the 95% level by prior (right/wrong), and proportion of missingness. Estimations with the *right* prior use the same priors as the data generating process, whereas estimations with the *wrong* prior used a prior that had a mean twice as large as the data generating process.

02-missing

Missing	psi0	psi1	mu0	m1	Pi
Right Prior					
[0.1, 0.2)	0.81	0.83	0.91	0.94	0.92
[0.2, 0.3)	0.86	0.92	0.90	0.94	0.92
[0.3, 0.4)	0.80	0.91	0.88	0.97	0.92
[0.4, 0.5]	0.85	0.94	0.92	0.96	0.95
NA	0.77	0.94	0.73	0.95	0.95

Table 2: Coverage probability at the 95% level by prior (right/wrong), and proportion of missingness. Estimations with the *right* prior use the same priors as the data generating process, whereas estimations with the *wrong* prior used a prior that had a mean twice as large as the data generating process.

03-pub-bias

Missing	psi0	psi1	mu0	m1	Pi
Right Prior					
[0.1, 0.2)	0.95	0.90	0.95	0.93	0.92
[0.2, 0.3)	0.96	0.94	0.92	0.94	0.93
[0.3, 0.4)	0.94	0.94	0.95	0.93	0.93
[0.4, 0.5]	0.93	0.95	0.96	0.97	0.95
NA	0.94	0.94	0.94	0.95	0.95

Table 3: Coverage probability at the 95% level by prior (right/wrong), and proportion of missingness. Estimations with the *right* prior use the same priors as the data generating process, whereas estimations with the *wrong* prior used a prior that had a mean twice as large as the data generating process.

04-full-model

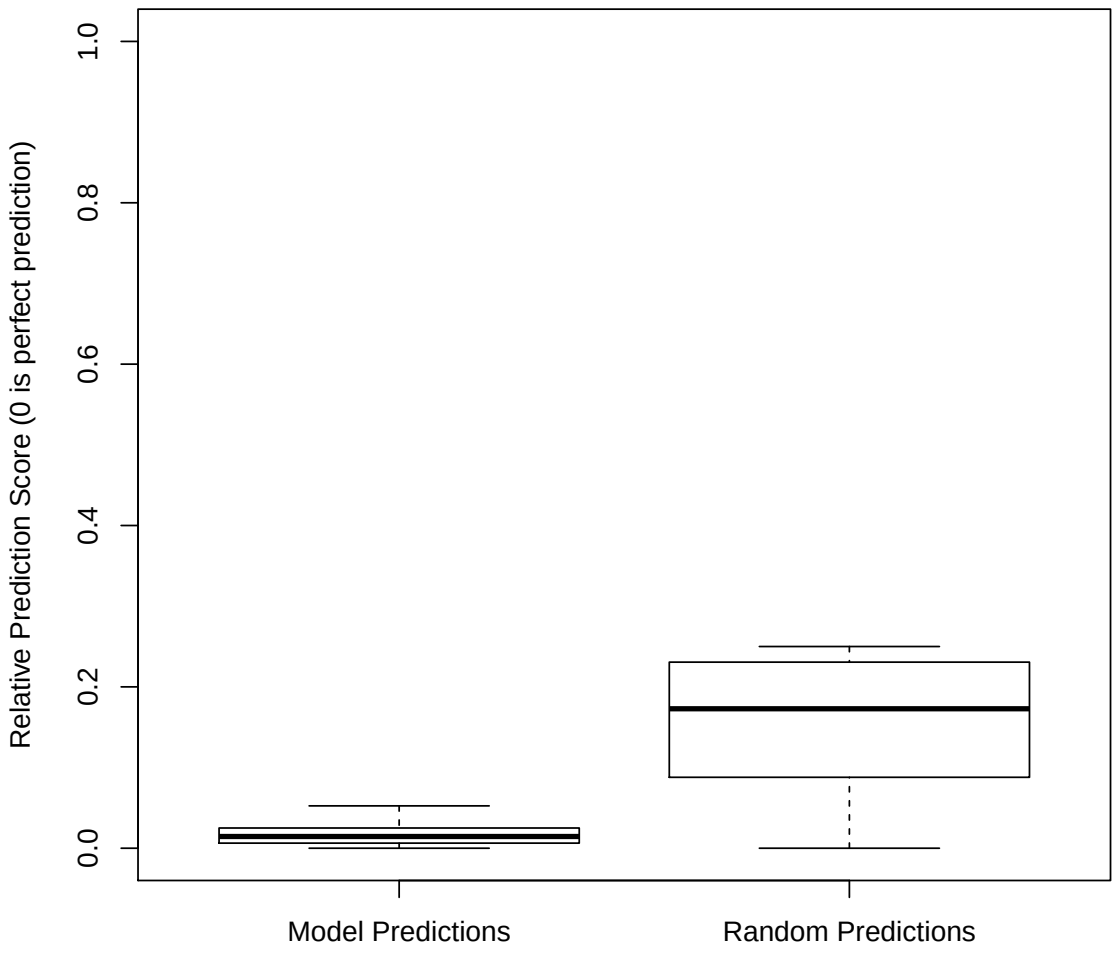
Missing	psi0	psi1	mu0	m1	Pi
Right Prior					
[0.1, 0.2)	0.93	0.92	0.94	0.94	0.93
[0.2, 0.3)	0.93	0.96	0.90	0.95	0.92
[0.3, 0.4)	0.90	0.95	0.89	0.95	0.92
[0.4, 0.5]	0.90	0.97	0.91	0.96	0.95
NA	0.81	0.95	0.70	0.95	0.95

Table 4: Coverage probability at the 95% level by prior (right/wrong), and proportion of missingness. Estimations with the *right* prior use the same priors as the data generating process, whereas estimations with the *wrong* prior used a prior that had a mean twice as large as the data generating process.

Prediction

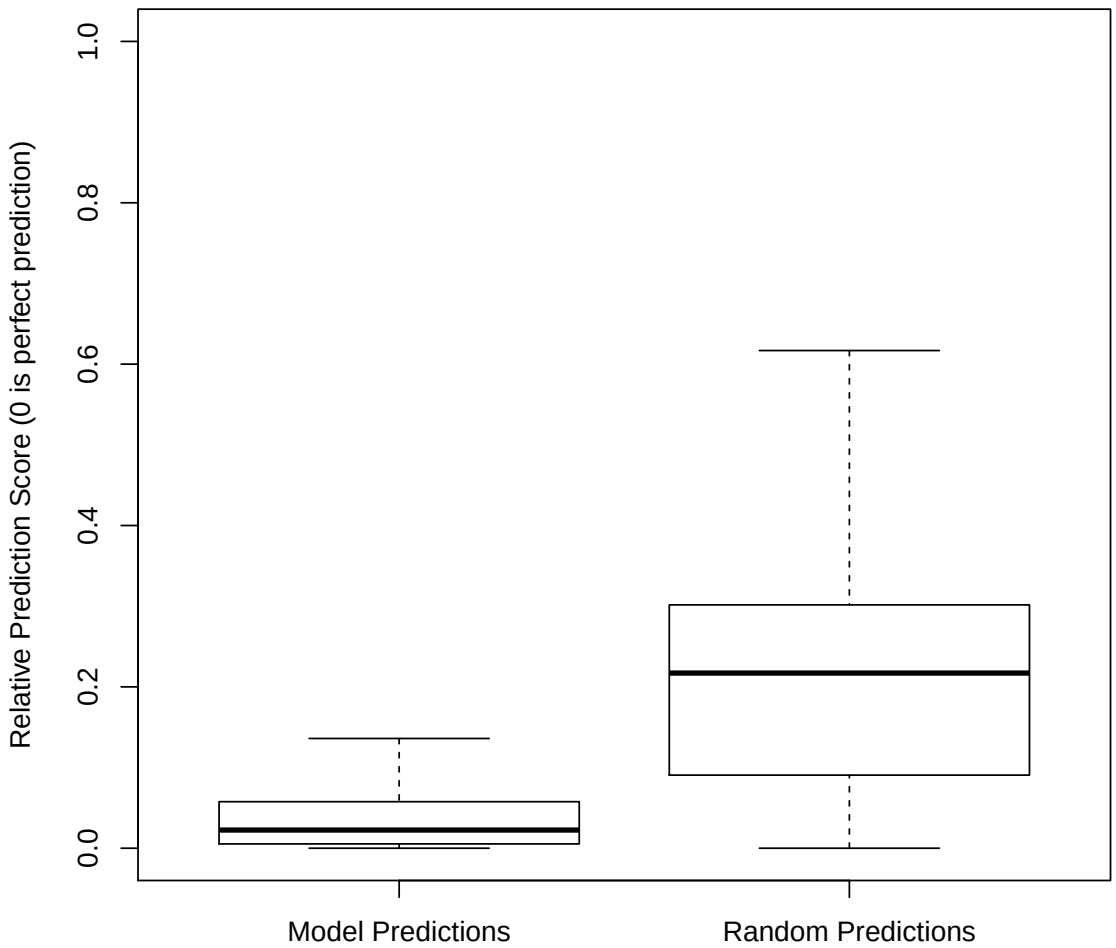
Contents

01-gold-standard

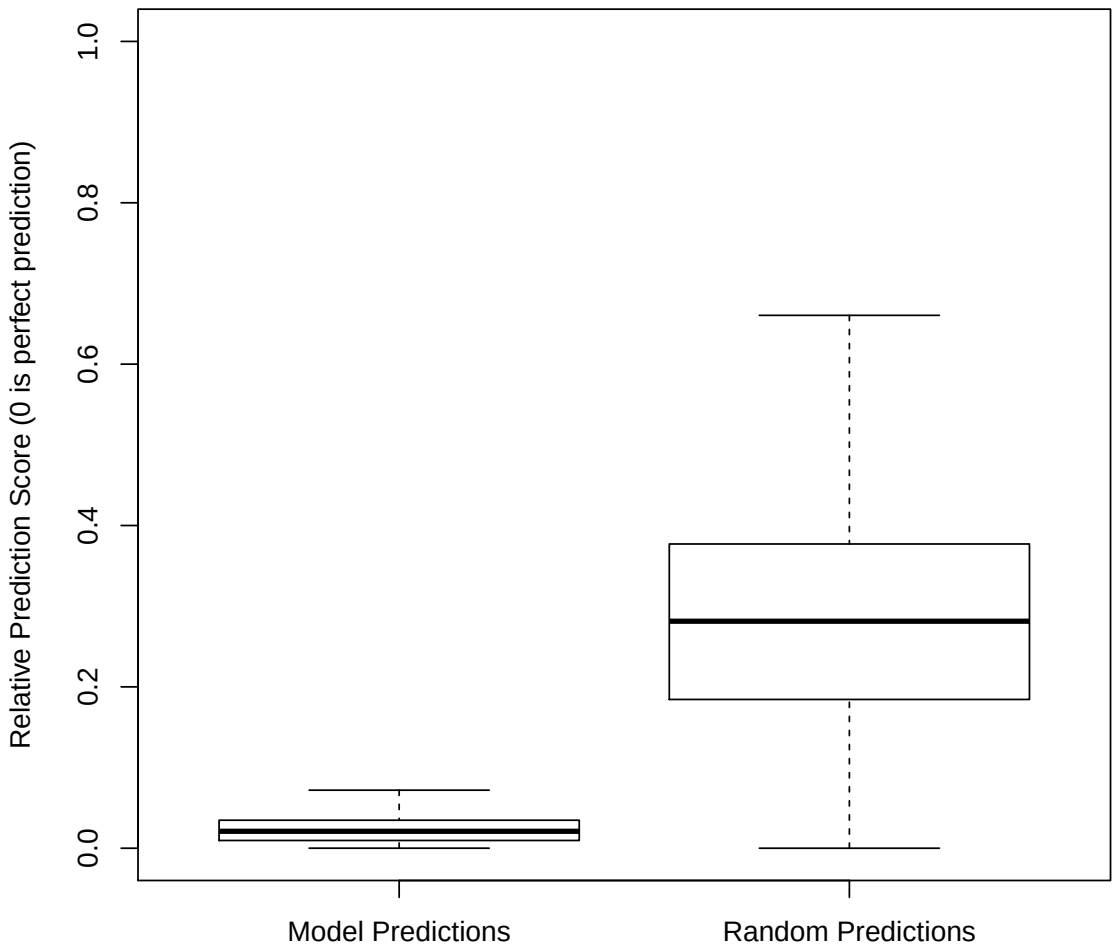


Random annotations based on a Bernoulli(0.42)

02-missing


Relative Prediction Score (0 is perfect prediction)
0.0
0.2
0.4
0.6
0.8
1.0
Model Predictions
Random Predictions
Random annotations based on a Bernoulli(0.42)

03-pub-bias



Random annotations based on a Bernoulli(0.42)

04-full-model