Political participation and subjective well-being

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Course on Bayesian Statistics
IPSA-HSE Summer School
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How does subjective well-being affect political participation?

- Institutional trust and subjective well‐being across the EU, Hudson (2006)
- Formal institutions and subjective well-being: Revisiting the cross-country evidence, Bjørnskov, Dreher (2010)
- Income, sense of community and subjective well-being: Combining economic and psychological variables, Jorgensen, Jamieson, Martin (2010)
- Subjective well-being and political participation: A comparison of unemployed and employed youth, Lorenzini (2015)
- Depression and political participation, C Ojeda (2015)

Data

- European Social Survey (ESS), France, round 8 (2016)
- 1871 observations
- DV: **confidence in own ability to participate in politics** (ordinal variable ranging from 1 -- total lack of confidence to 5 -- full confidence)
- IVs:
  - Subjective general health (health): 1 -- very good, 5 -- very bad
  - Take part in social activities compared to others of same age (sclact): 1 -- much less than most, 5 -- much more than most
  - How many people with whom you can discuss intimate and personal matters (inprdsc): None, 1, 2, 3, 4-6, 7-9, 10 or more
  - Respondent or household member victim of burglary/assault last 5 years (crmvct): 1 -- yes, 2 -- no
  - Feeling of safety of walking alone in local area after dark (aesfdrk): 1 -- very safe, 2 -- safe, 3 -- unsafe, 4 -- very unsafe
  - Feeling about household's income nowadays (hincfel): 1 -- living comfortably on present income, 2 -- coping on present income, 3 -- Difficult on present income, 4 -- Very difficult on present income

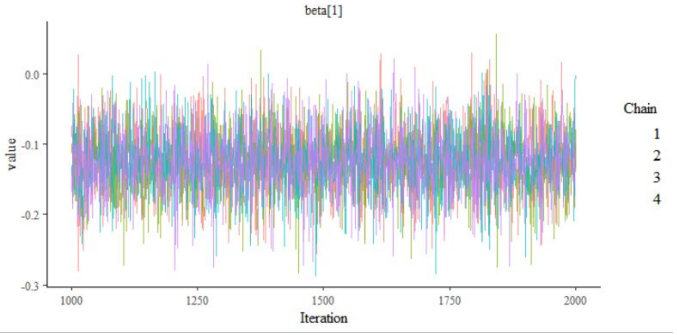
Descriptive statistics

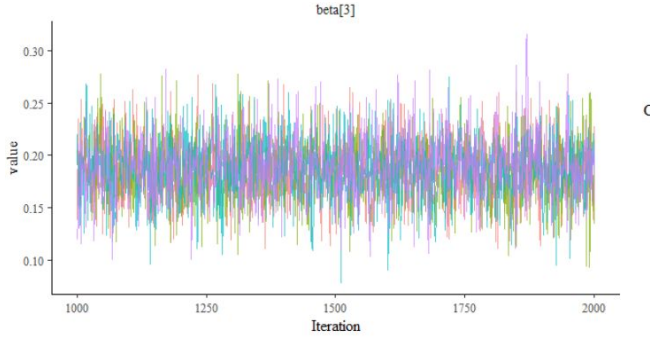
cptppola	sclmeet	sclact	inprdsc	health	hlthhmp	crmvct	aesfdrk	hincfel
1:462	Min. :1.000	Min. :1.000	Min. :0.000	Min. :1.000	Min. :1.000	Min. :1.000	Min. :1.000	Min. :1.000
2:733	1st Qu.:4.000	1st Qu.:3.000	1st Qu.:2.000	1st Qu.:2.000	1st Qu.:2.000	1st Qu.:2.000	1st Qu.:1.000	1st Qu.:1.000
3:548	Median :6.000	Median :3.000	Median :3.000	Median :2.000	Median :3.000	Median :2.000	Median :2.000	Median :2.000
4: 87	Mean :5.273	Mean :2.919	Mean :2.624	Mean :2.369	Mean :2.618	Mean :1.774	Mean :1.976	Mean :1.912
5: 41	3rd Qu.:6.000	3rd Qu.:3.000	3rd Qu.:4.000	3rd Qu.:3.000	3rd Qu.:3.000	3rd Qu.:2.000	3rd Qu.:2.000	3rd Qu.:2.000
	Max. :7.000	Max. :5.000	Max. :6.000	Max. :5.000	Max. :3.000	Max. :2.000	Max. :4.000	Max. :4.000

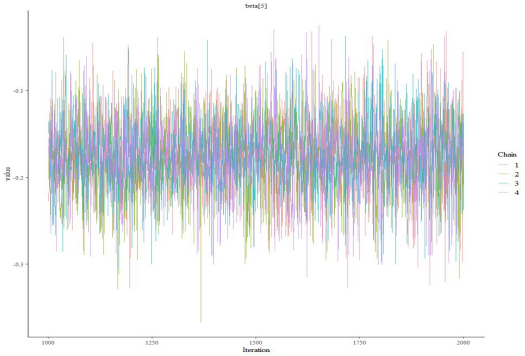
Fitting the model with rstanarm

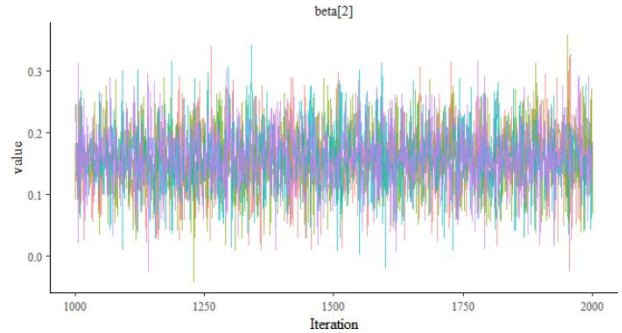
```
rst_polr <- stan_polr(cptppola ~ health +
                        sclact + inprdsc +
                        crmvct + aesfdrk +
                        hincfel, data = euro,
                         prior = NULL)
```

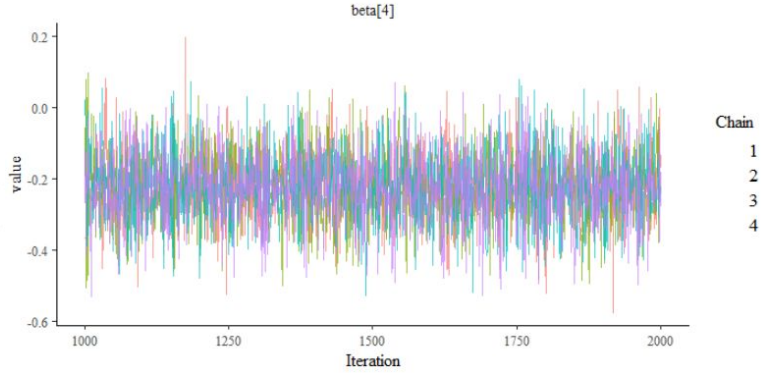
Convergence diagnostics visualization: traceplots (1)









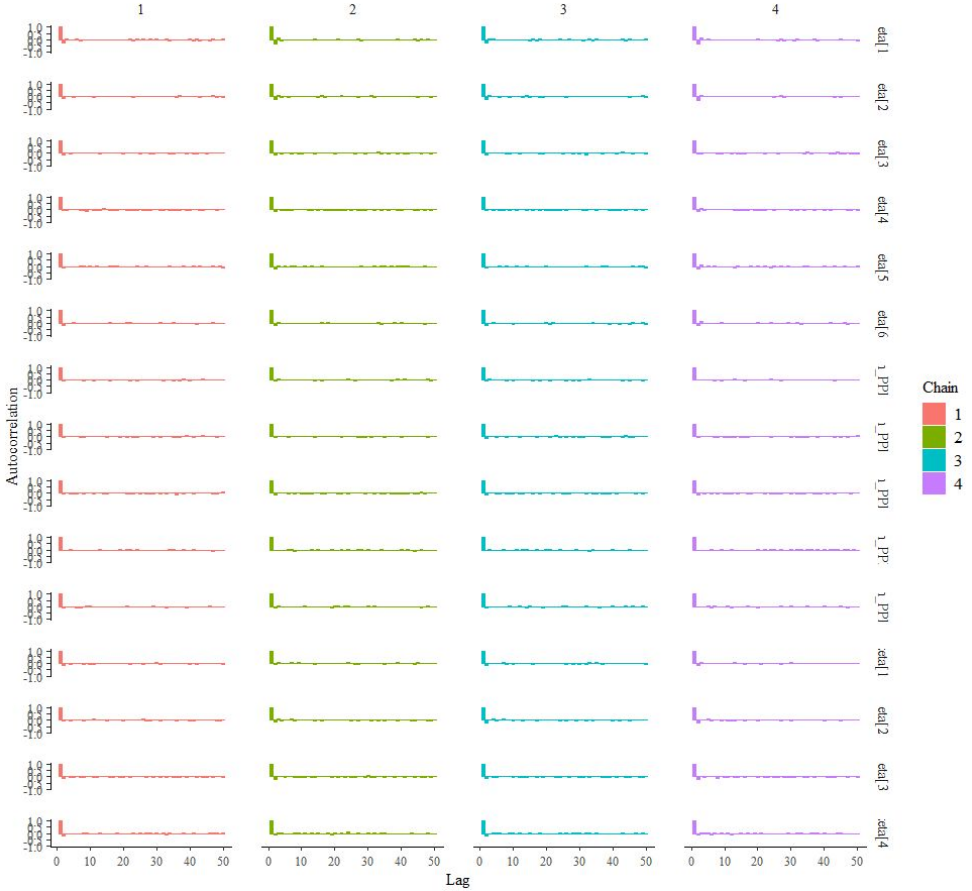


The degree of convergence of a random Markov Chain (R hat)

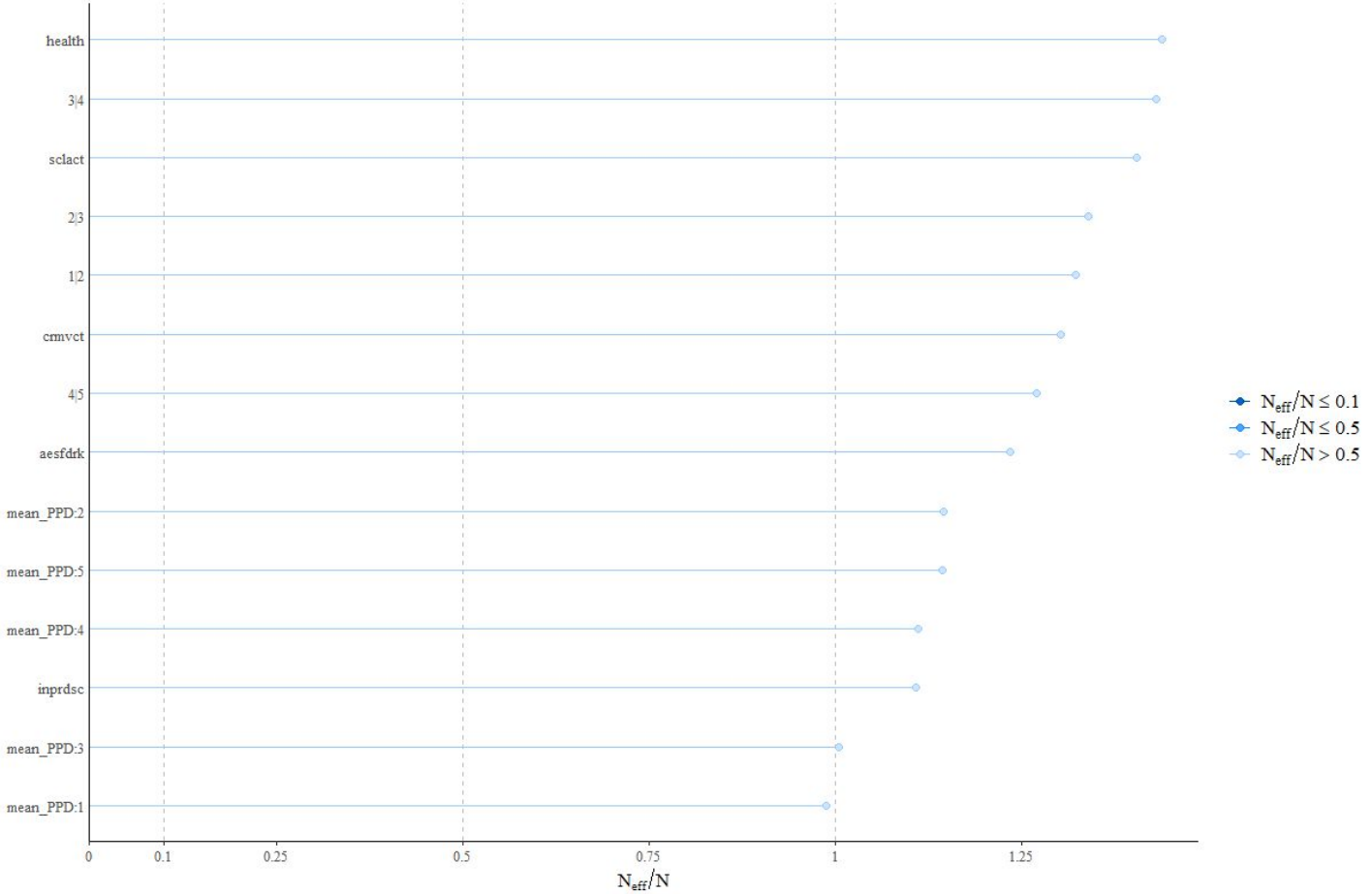
health	sclact	inprdsc	crmvct	aesfdrk	1|2	2|3	3|4	4|5
0.9998180	0.9993694	0.9992266	0.9997213	0.9996663	0.9994174	0.9994988	0.9997952	0.9995736

mean_PPD:1	mean_PPD:2	mean_PPD:3	mean_PPD:4	mean_PPD:5
1.0005829	0.9996228	1.0000948	0.9995668	1.0000094

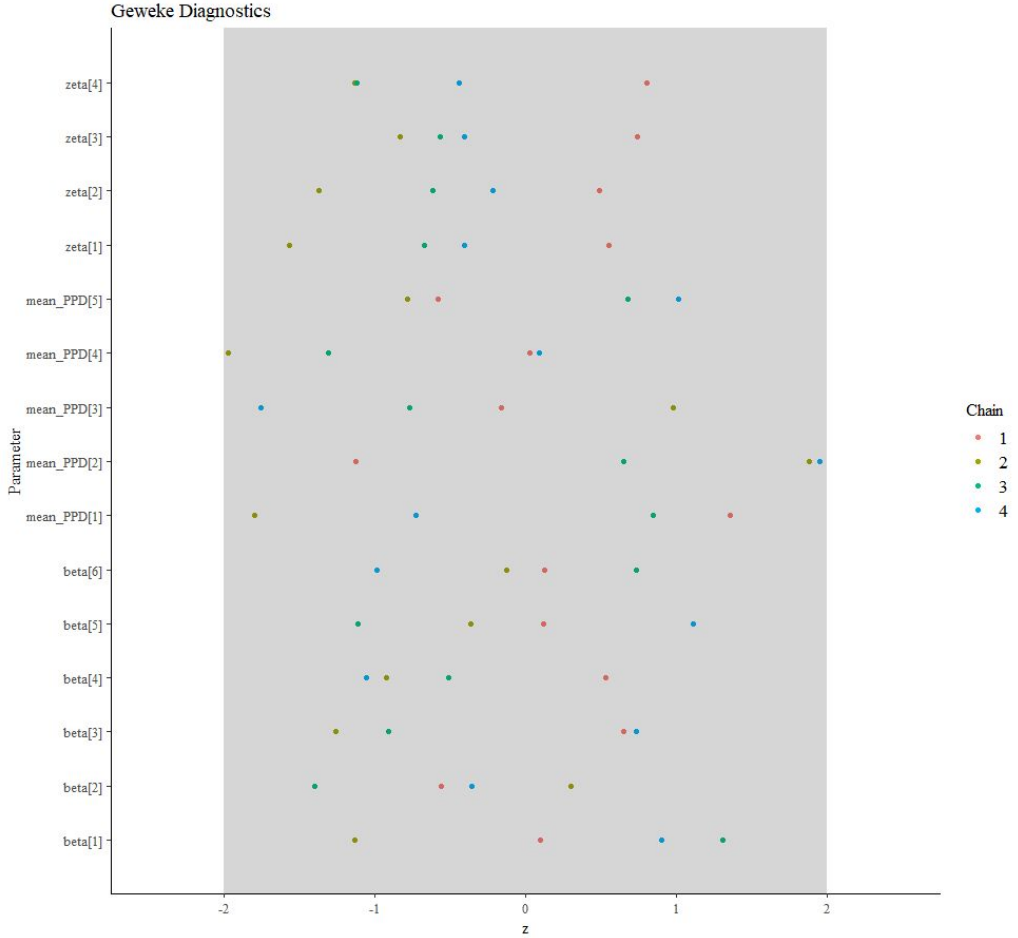
Autocorrelation diagnostics: plots



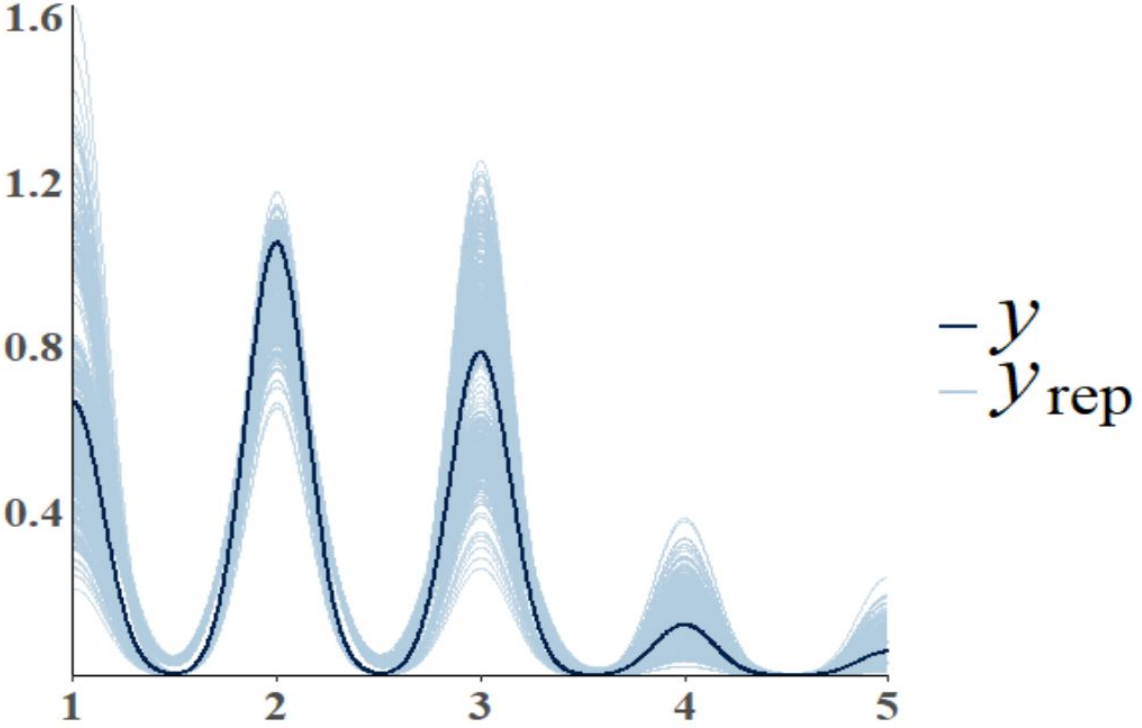
The ratio of effective sample size to N



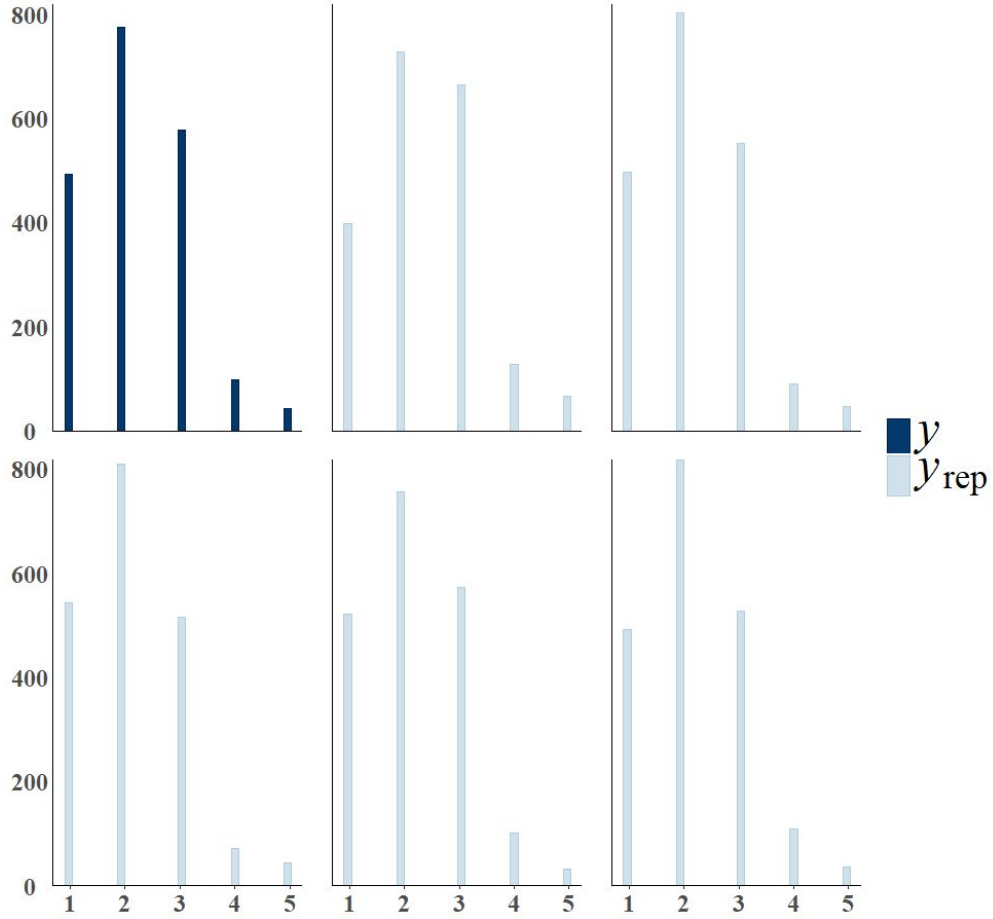
Stationarity diagnostics: Geweke test



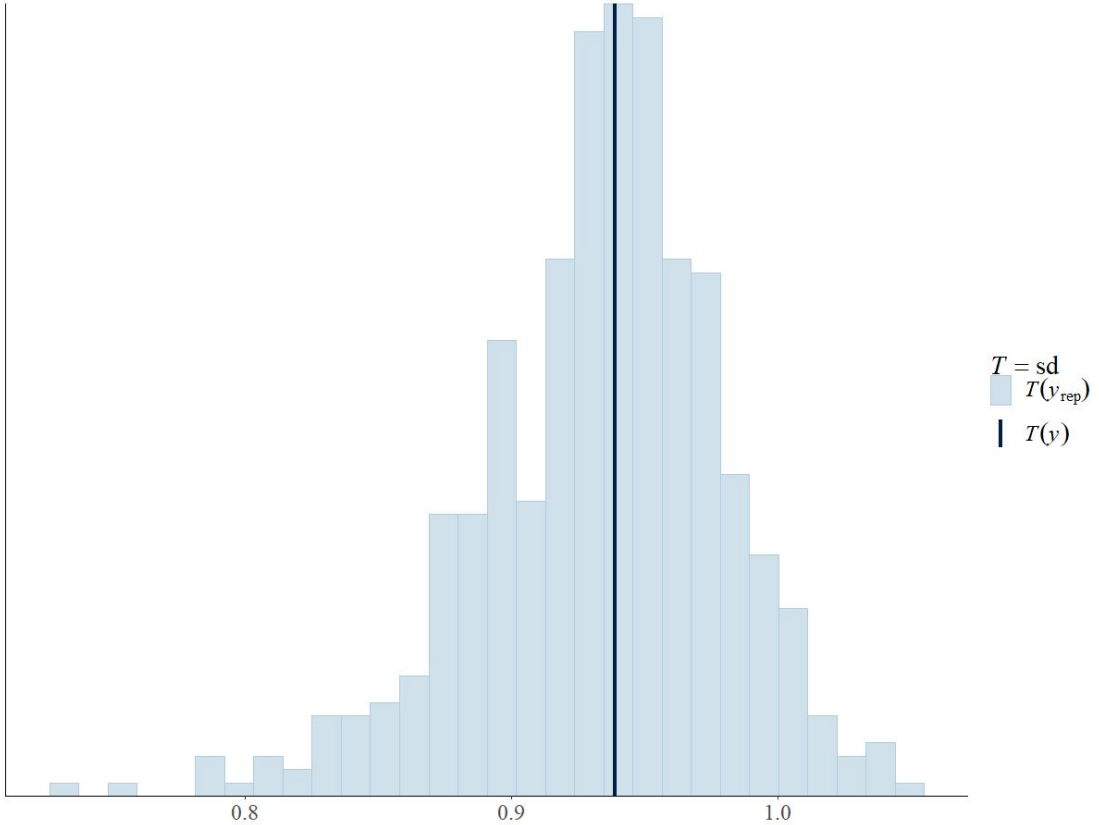
Posterior predictive checks: observed vs. replicated densities



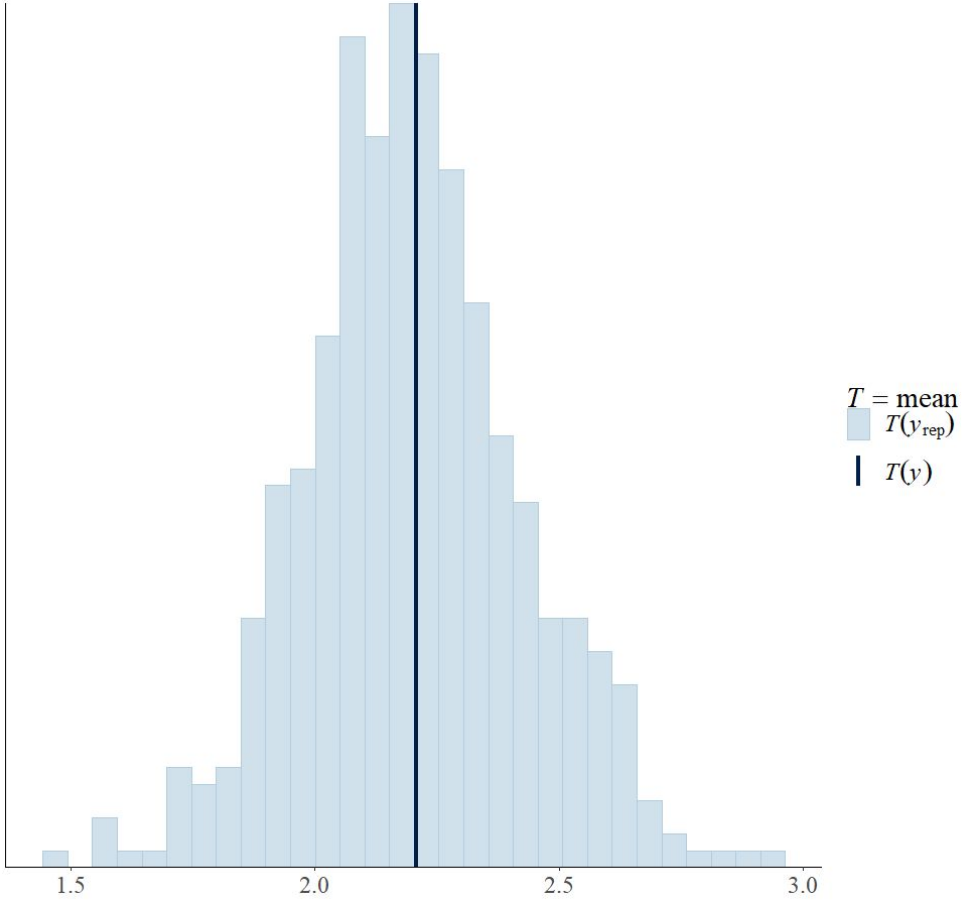
PPC: histograms of observed and rep. data

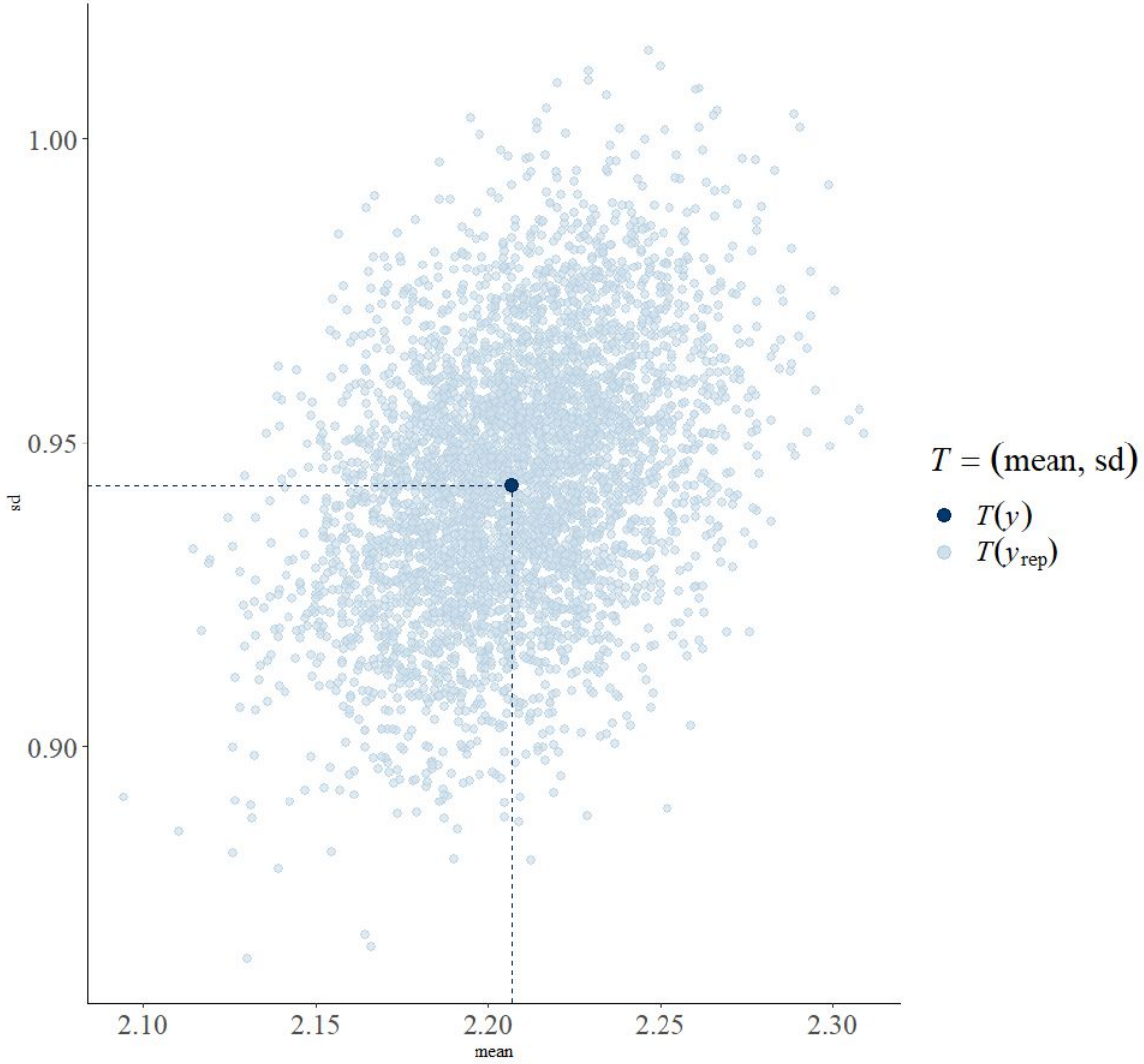


PPC: Observed variance vs. replicated variances



PPC: Observed mean vs. replicated mean




1.00
0.95
0.90
sd
2.10
2.15
2.20
2.25
2.30
mean
T = (mean, sd)
T(y)
T(y_rep)

Model comparison

```
rst_reduce_sclact <- stan_polr(cptppola ~ health +
                          inprdsc +
                          crmvct + aesfdrk + hincfel, data = euro,
                        prior = NULL)


rst_reduce_inprdsc <- stan_polr(cptppola ~ health +
                          sclact +
                          crmvct + aesfdrk + hincfel, data = euro,
                        prior = NULL)
```

WAIC

Model 1:

	Estimate	SE
elpd_waic	-2535.492	27.114
p_waic	10.331	0.297
waic	5070.983	54.227

Model 2:

	Estimate	SE
elpd_waic	-2538.009	27.136
p_waic	9.332	0.270
waic	5076.018	54.273

Model 3:

	Estimate	SE
elpd_waic	-2554.244	26.945
p_waic	9.339	0.280
waic	5108.488	53.890

LOO CV

Model 1:

	Estimate	SE
elpd_loo	-2535.601	27.114
p_loo	10.428	0.298
looic	5071.202	54.228

Model 2:

	Estimate	SE
elpd_loo	-2538.019	27.137
p_loo	9.342	0.271
looic	5076.038	54.273

Model 3:

	Estimate	SE
elpd_loo	-2554.254	26.945
p_loo	9.349	0.281
looic	5108.508	53.890

LOO CV and WAIC (baseline model vs rst_reduce_sclact)

LOO

```
elpd_diff        se
   -2.418     2.672
```

WAIC

```
elpd_diff        se
   -2.419     2.672
```

LOO CV (baseline model vs rst_reduce_inprdsc)

LOO

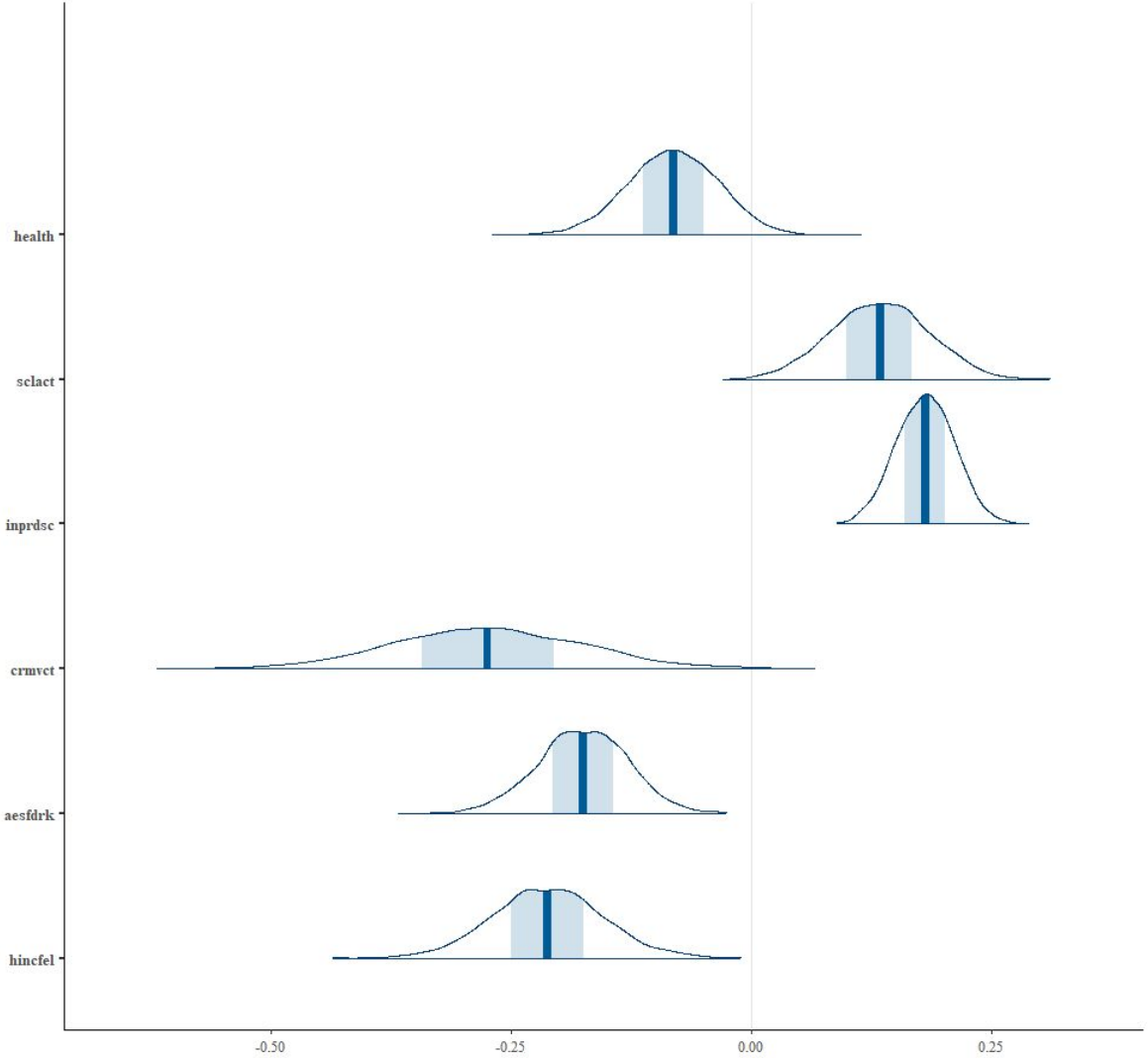
```
elpd_diff        se
 -18.653     6.250
```

WAIC

```
elpd_diff        se
  -18.654     6.250
```

Results of fitting Ordinal Regression Model

term	estimate	std.error	conf.low	conf.high
health	-0.124	0.047	-0.220	-0.031
sclact	0.156	0.052	0.055	0.262
inprdsc	0.186	0.031	0.125	0.247
crmvct	-0.225	0.102	-0.422	-0.026
aesfdrk	-0.190	0.046	-0.280	-0.100
hincfel	-0.211	0.057	-0.323	-0.094
1|2	-1.375	0.335	-2.022	-0.713
2|3	0.379	0.333	-0.262	1.038
3|4	2.466	0.343	1.807	3.132
4|5	3.665	0.368	2.961	4.411


health
sclact
inprdsc
crmvct
aesfdrk
hincfel
-0.50
-0.25
0.00
0.25

Odd ratios

health	sclact	inprdsc	crmvct	aesfdrk	hincfel
0.9223587	1.1440367	1.1991595	0.7601553	0.8395769	0.8091215