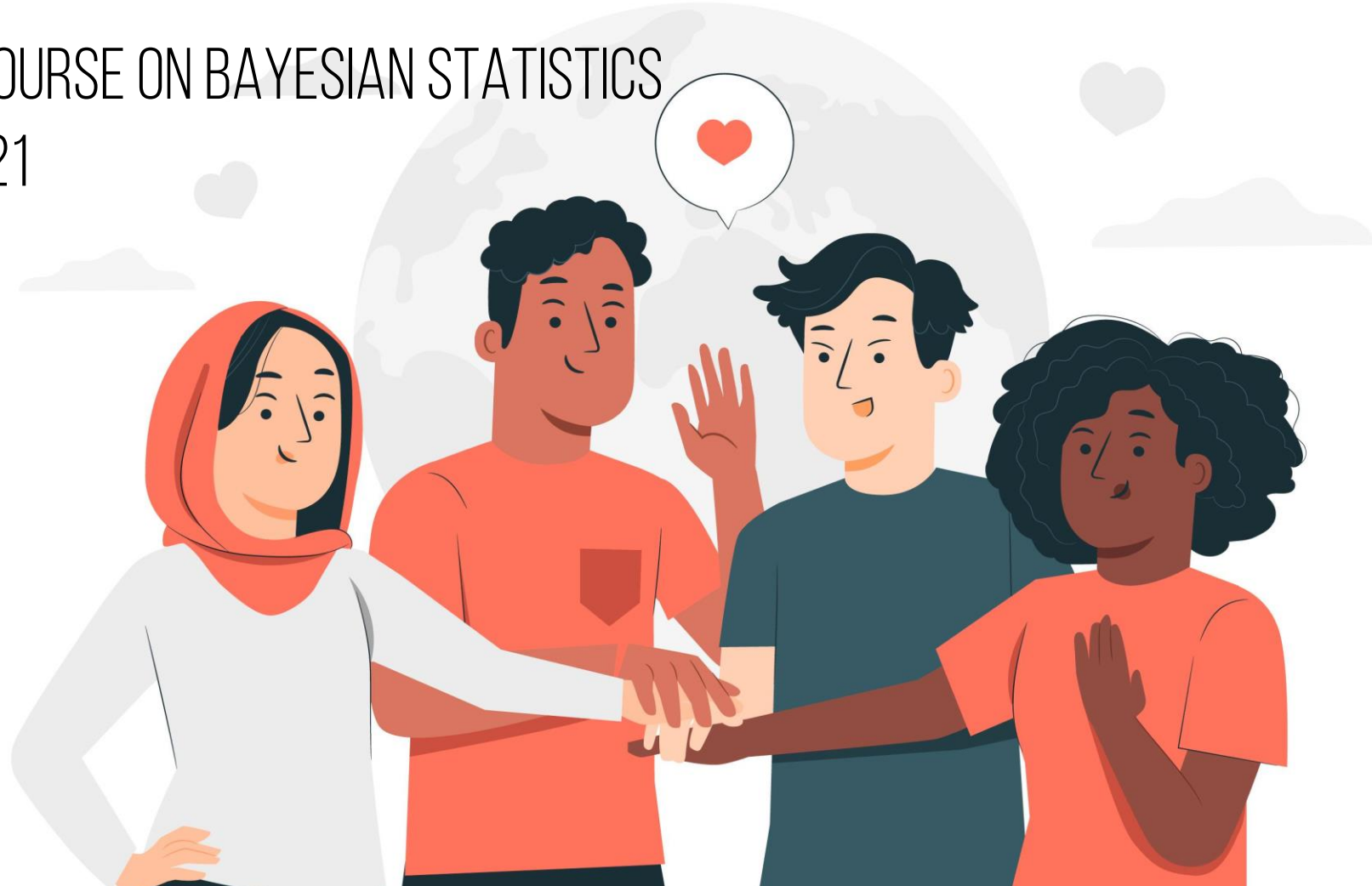# IMMIGRATION AND TRUST

RESEARCH PROJECT FOR THE COURSE ON BAYESIAN STATISTICS

IPSA-HSE SUMMER SCHOOL 2021

Presented by:
Ksenia Lapshina

HOW DOES GENERAL AND INSTITUTIONAL TRUST AFFECT ATTITUDE TOWARDS IMMIGRANTS ?

1. People with higher institutional trust express higher solidarity with refugees (Koos, Seibel, 2019)

2. '... those with high social capital do exhibit more positive attitudes towards immigration than the rest of the population' (Herreros, Criado, 2009)

3. '... social trust is important for both groups [ethnic majority and minority], while trust in institutions is more strongly related to the attitudes among ethnic majorities (Halapuu, Tammaru, 2014)

Main hypothesis: indicators of both institutional and general trust are positively related to the attitude towards immigrants.

DATA:

European Social Survey (ESS), Round 9 (2018)
Germany subset
2292 observations

Dependent Variable

[Attitude towards immigrants]
Immigrants make country worse or better place to live (imwbcnt) — 0 – worse place to live, 10 – better place to live

Independent Variables

Variable	Scale
Trust in country's parliament (trstprl)	0 – no trust at all, 10 – complete trust
Trust in the legal system (trstlgl)	0 – no trust at all, 10 – complete trust
Trust in the police (trstplc)	0 – no trust at all, 10 – complete trust
Most people can be trusted or you can't be too careful (ppltrst)	0 – you can't be too careful, 10 – most people can be trusted
Most people try to take advantage of you, or try to be fair (pplfair)	0 – most people try to take advantage of you, 10 – most people try to be fair
Most of the time people helpful or mostly looking out for themselves (pplhlp)	0 – people mostly look out for themselves, 10 – people mostly try to be helpful

Model: linear regression

Package: RStanARM

```
stan_reg <- stan_glm(imwbcnt ~ trstprl + trstlgl + trstplc +
                       ppltrst + pplfair +
                       pplhlp,
                     data = data_de, iter = 200000,
                     chains = 4, thin=10)
```

LINEAR REGRESSION USING RSTANARM PACKAGE

| term	estimate	std.error	conf.low	conf.high
(Intercept)	2.478	0.182	2.125	2.842
trstprl	0.246	0.021	0.206	0.289
trstlgl	0.127	0.024	0.081	0.174
trstplc	-0.068	0.024	-0.116	-0.021
ppltrst	0.141	0.022	0.098	0.185
pplfair	0.056	0.025	0.006	0.104
pplhlp	0.041	0.024	-0.006	0.089
sigma	1.989	0.029	1.933	2.047

POSTERIOR DISTRIBUTIONS
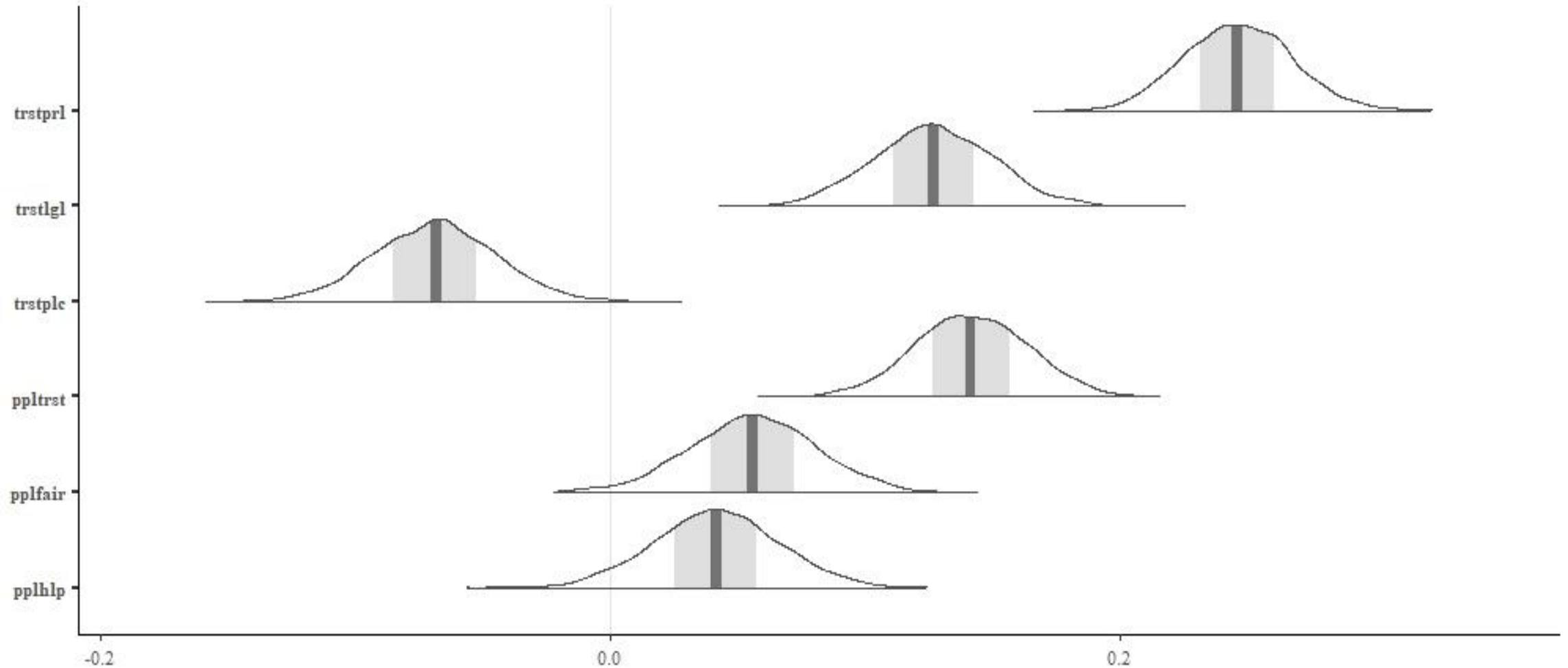
CONVERGENCE DIAGNOSTICS: TRACE PLOTS
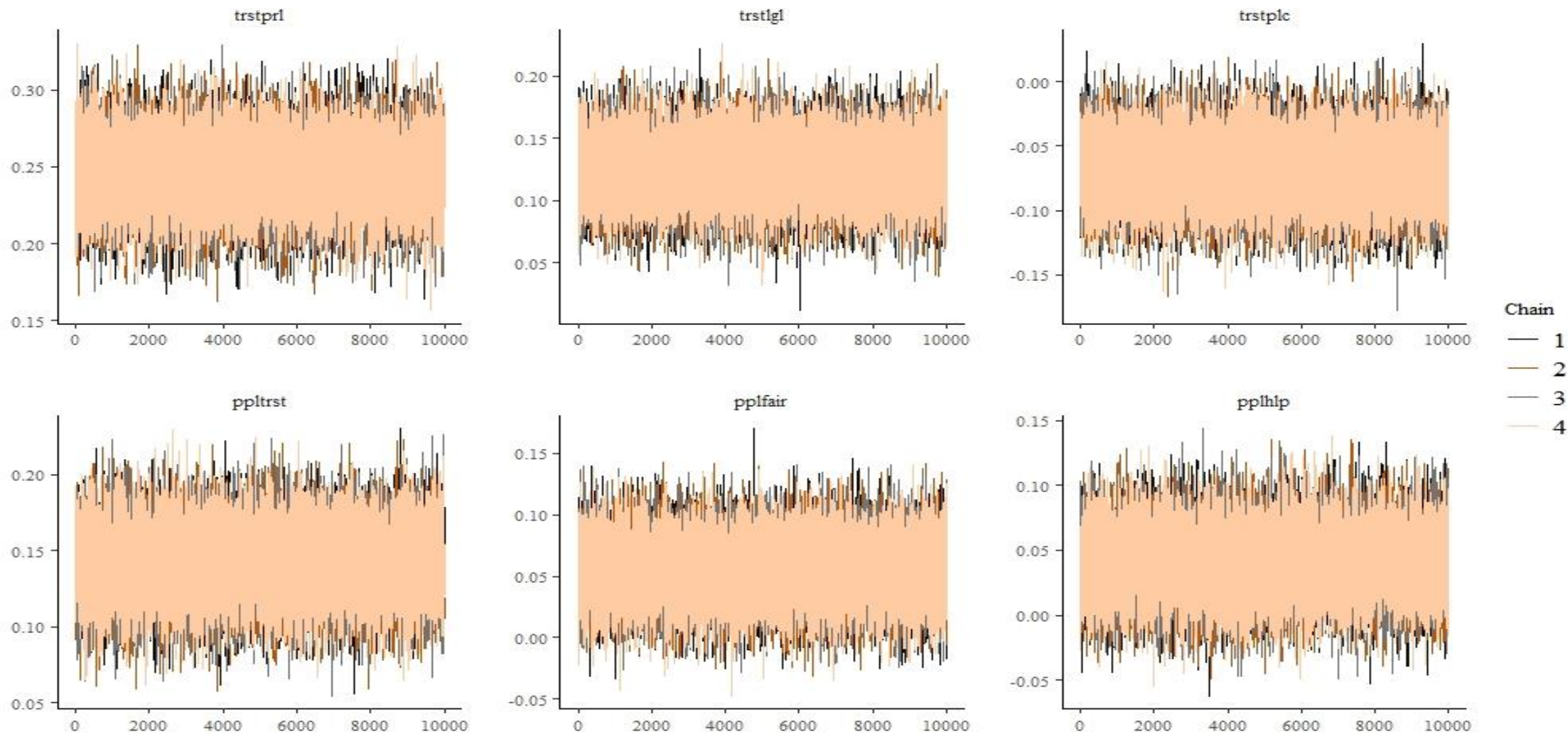
CONVERGENCE DIAGNOSTICS: DENSITY PLOTS
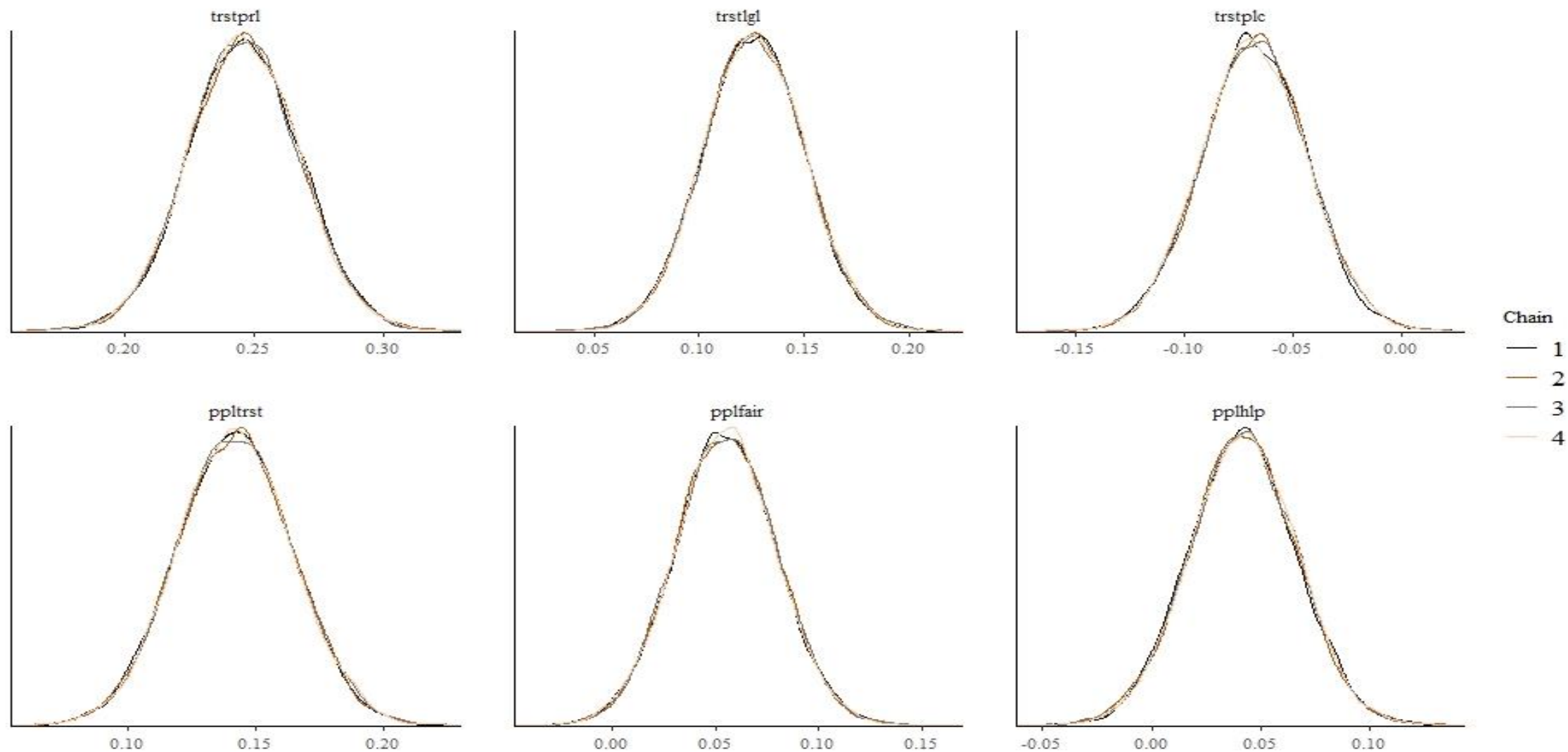
CONVERGENCE DIAGNOSTICS: R-HAT

|	x
(Intercept)	1.0001432
trstprl	1.0000702
trstlgl	0.9999389
trstplc	1.0000961
ppltrst	1.0000155
pplfair	0.9999455
pplhlp	0.9999649
sigma	0.9999843
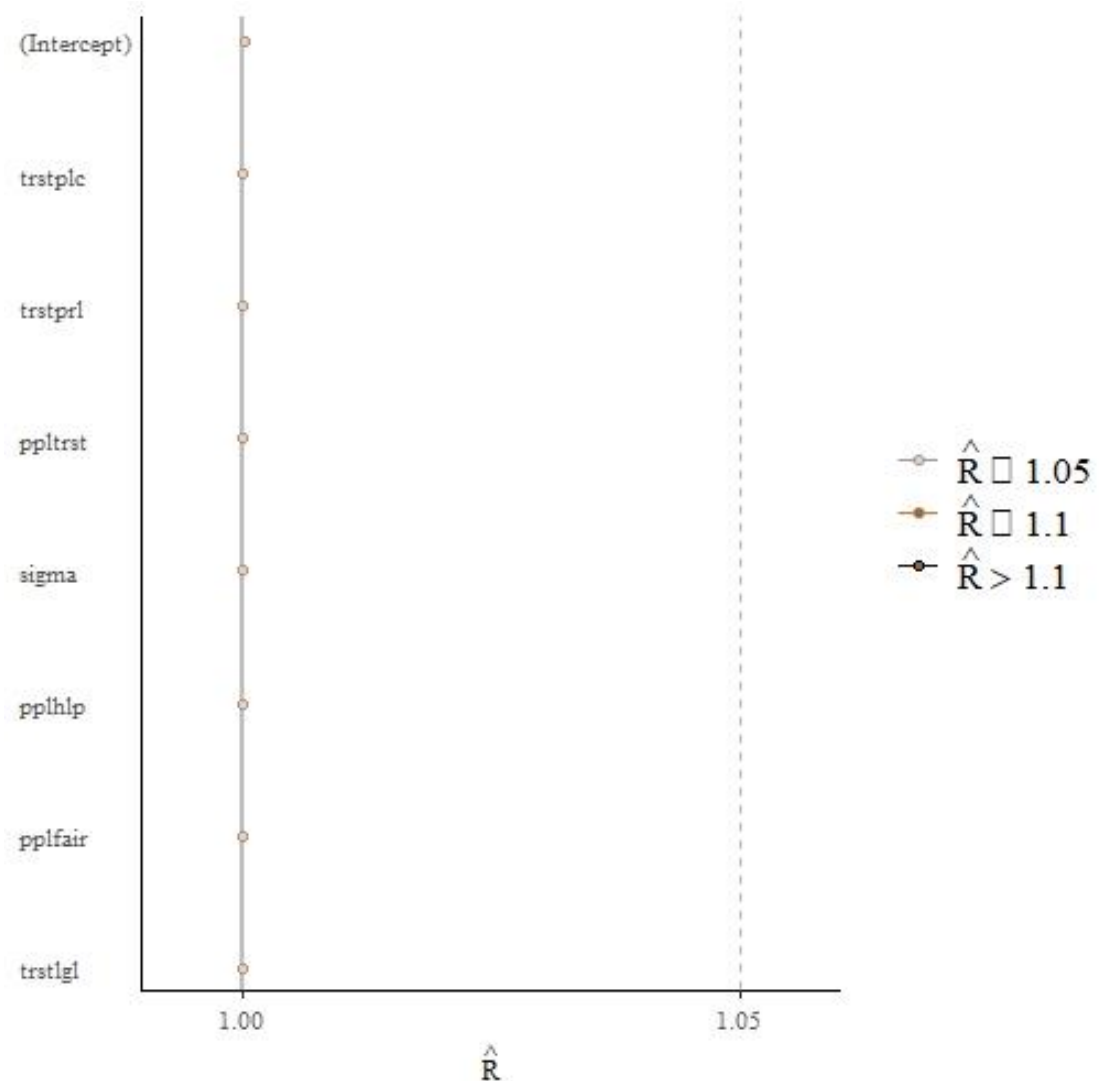
STATIONARITY:
HEIDELBERGER AND WELSH

	Stationarity test	start iteration	p-value
(Intercept)	passed	1	0.1347
trstprl	passed	8001	0.0919
trstlgl	passed	1	0.2656
trstplc	passed	1	0.4971
ppltrst	passed	1	0.1804
pplfair	passed	1	0.5768
pplhlp	passed	1	0.0677
sigma	passed	1	0.6848

|	Halfwidth test	Mean	Halfwidth
(Intercept)	passed	2.4751	0.001784
trstprl	passed	0.2460	0.000233
trstlgl	passed	0.1261	0.000232
trstplc	passed	-0.0679	0.000236
ppltrst	passed	0.1417	0.000219
pplfair	passed	0.0551	0.000241
pplhlp	passed	0.0416	0.000240
sigma	passed	1.9903	0.000289

AUTOCORRELATION
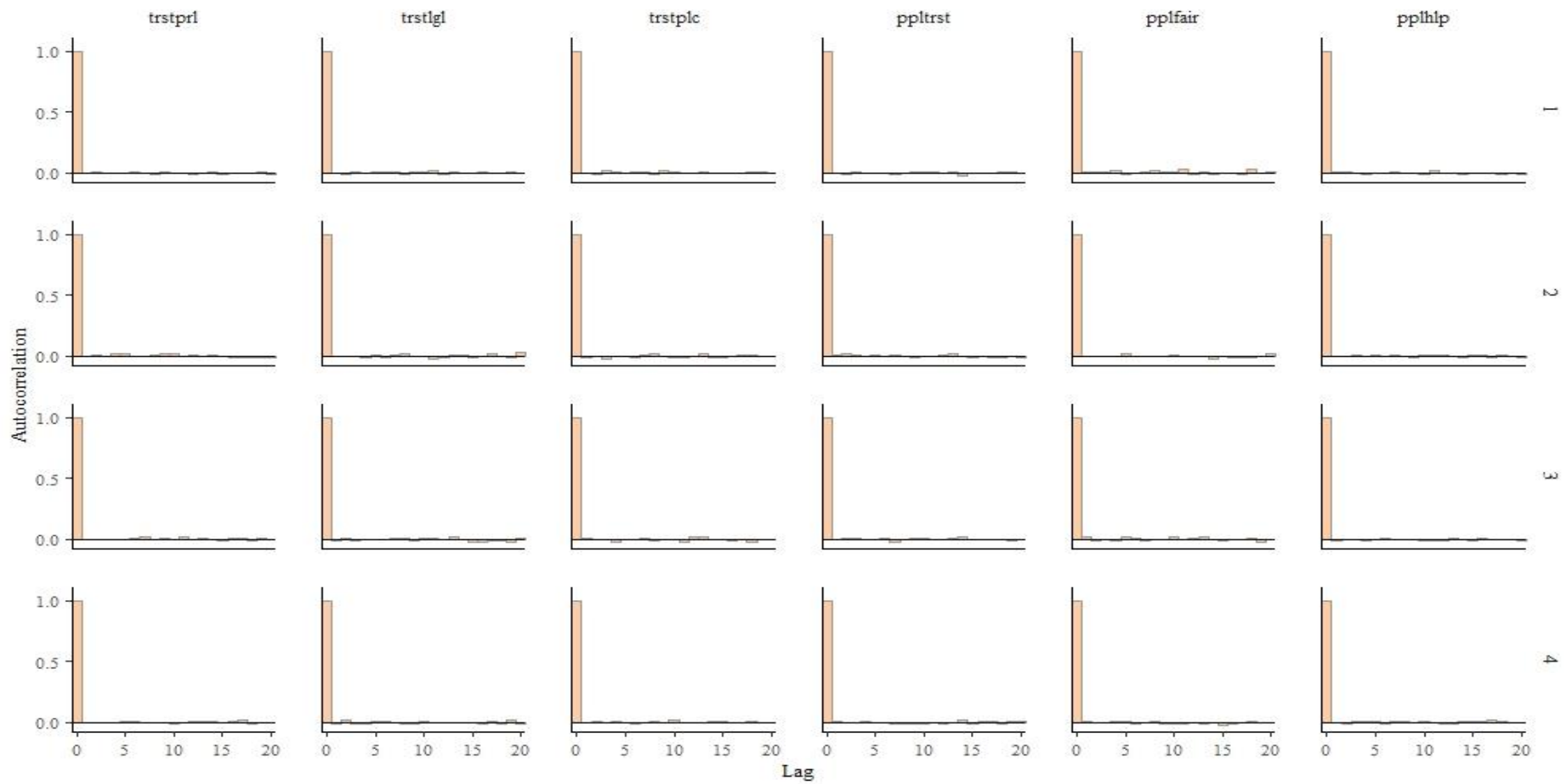
EFFECTIVE SAMPLES
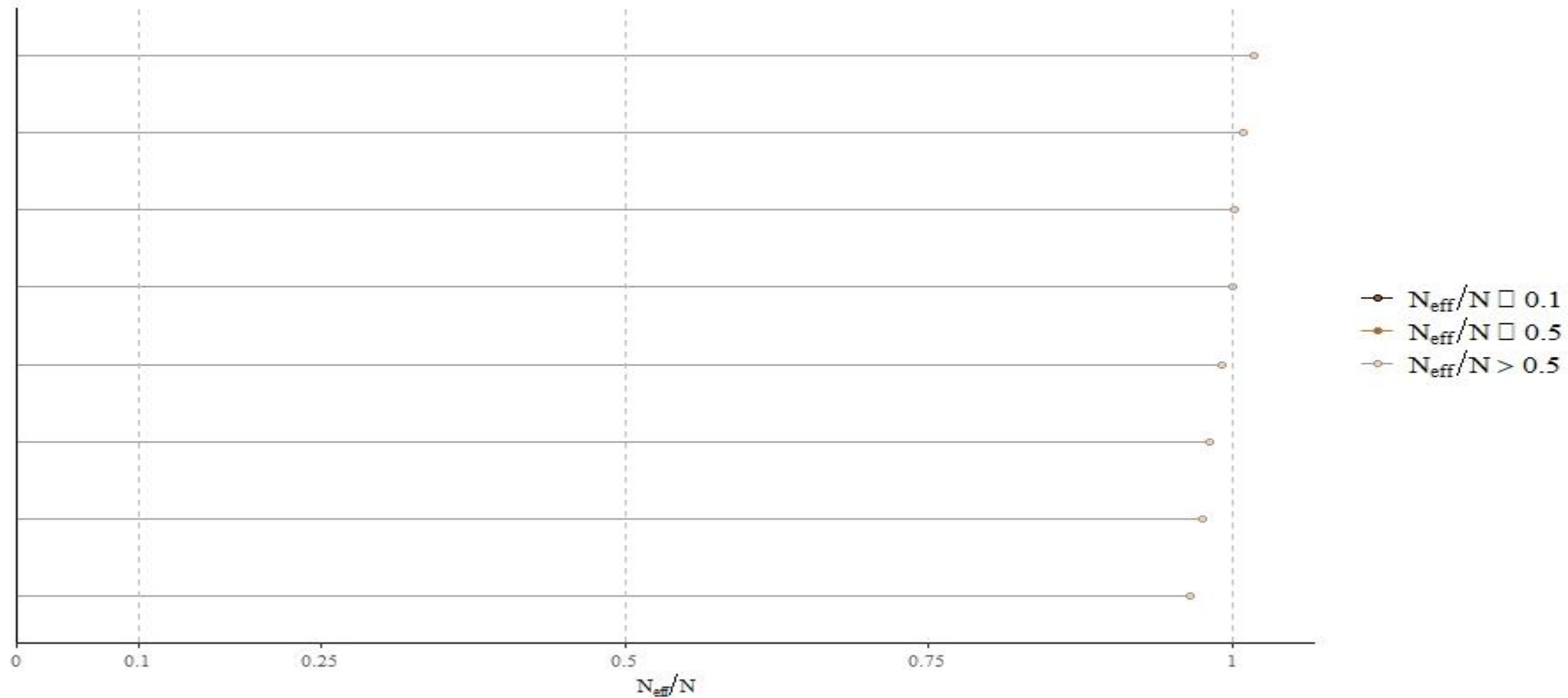
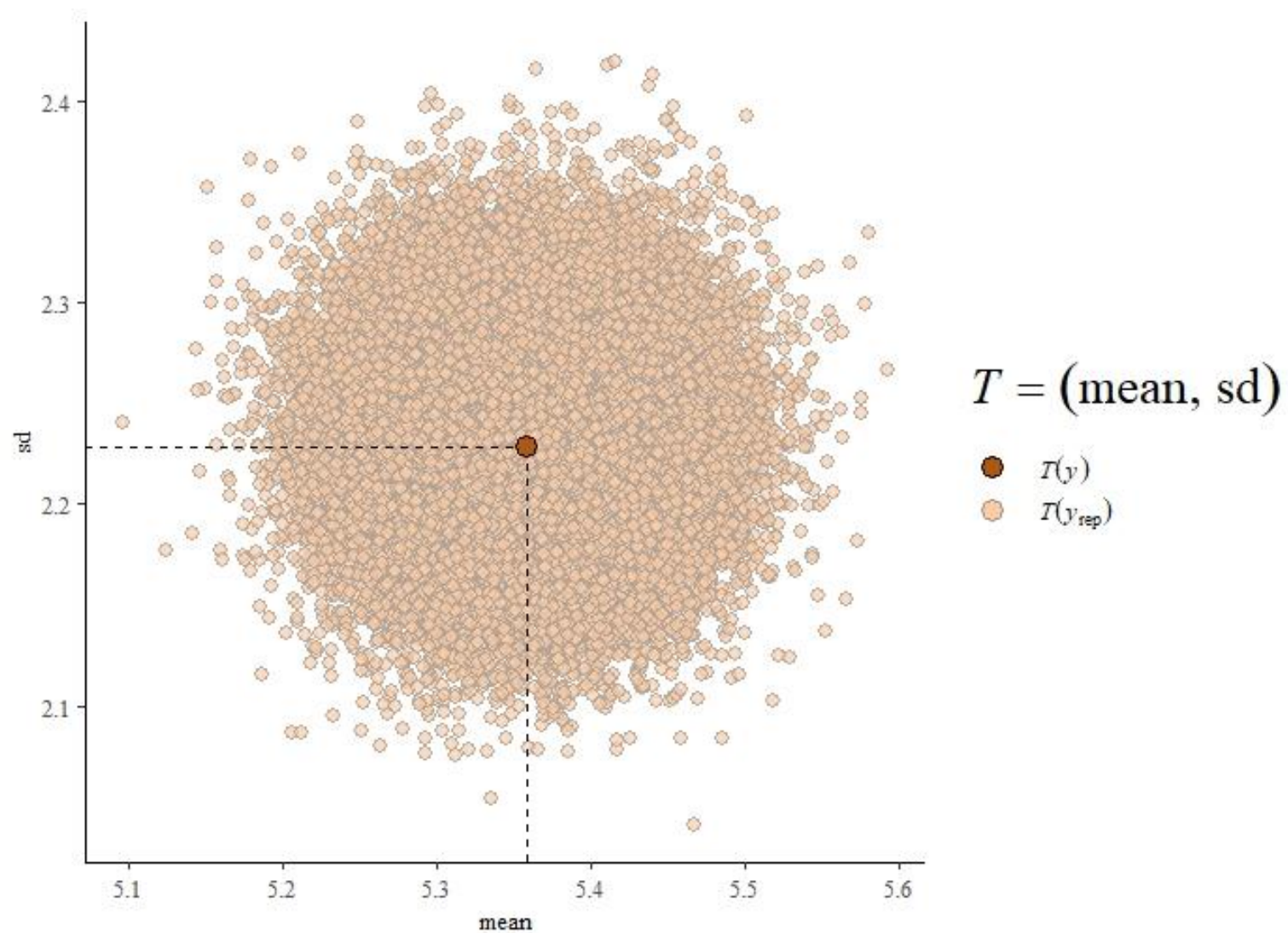# POSTERIOR PREDICTED CHECKS: PLOTS FOR REPLICATED AND OBSERVED DATA
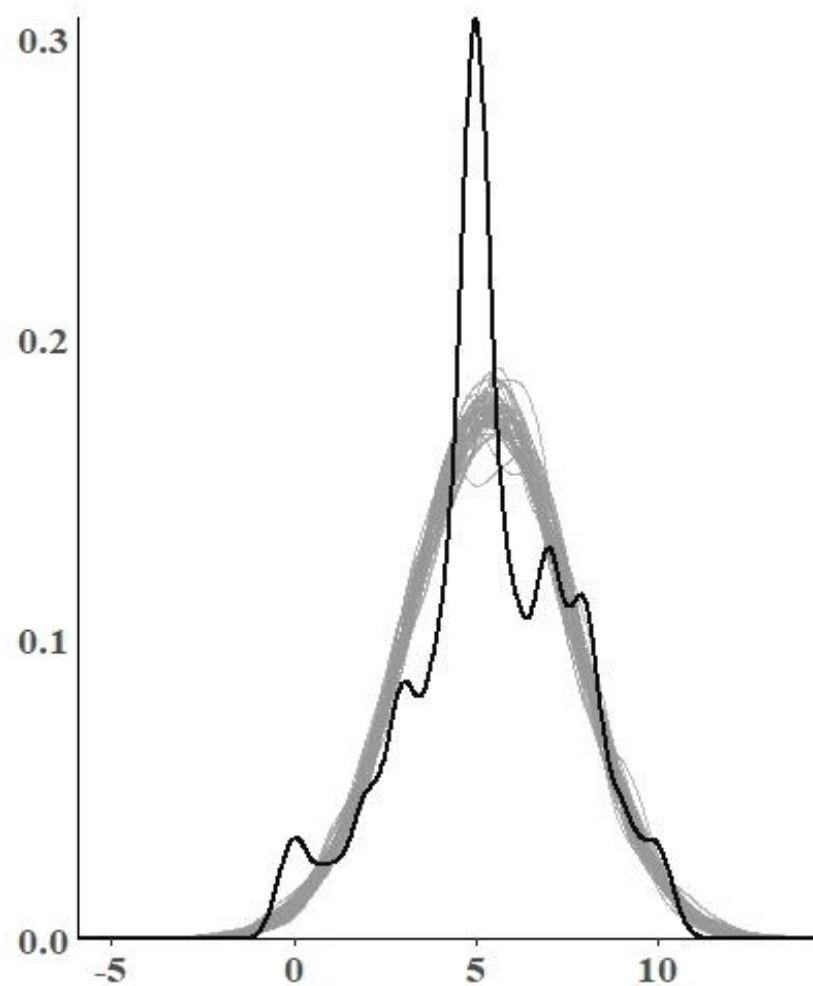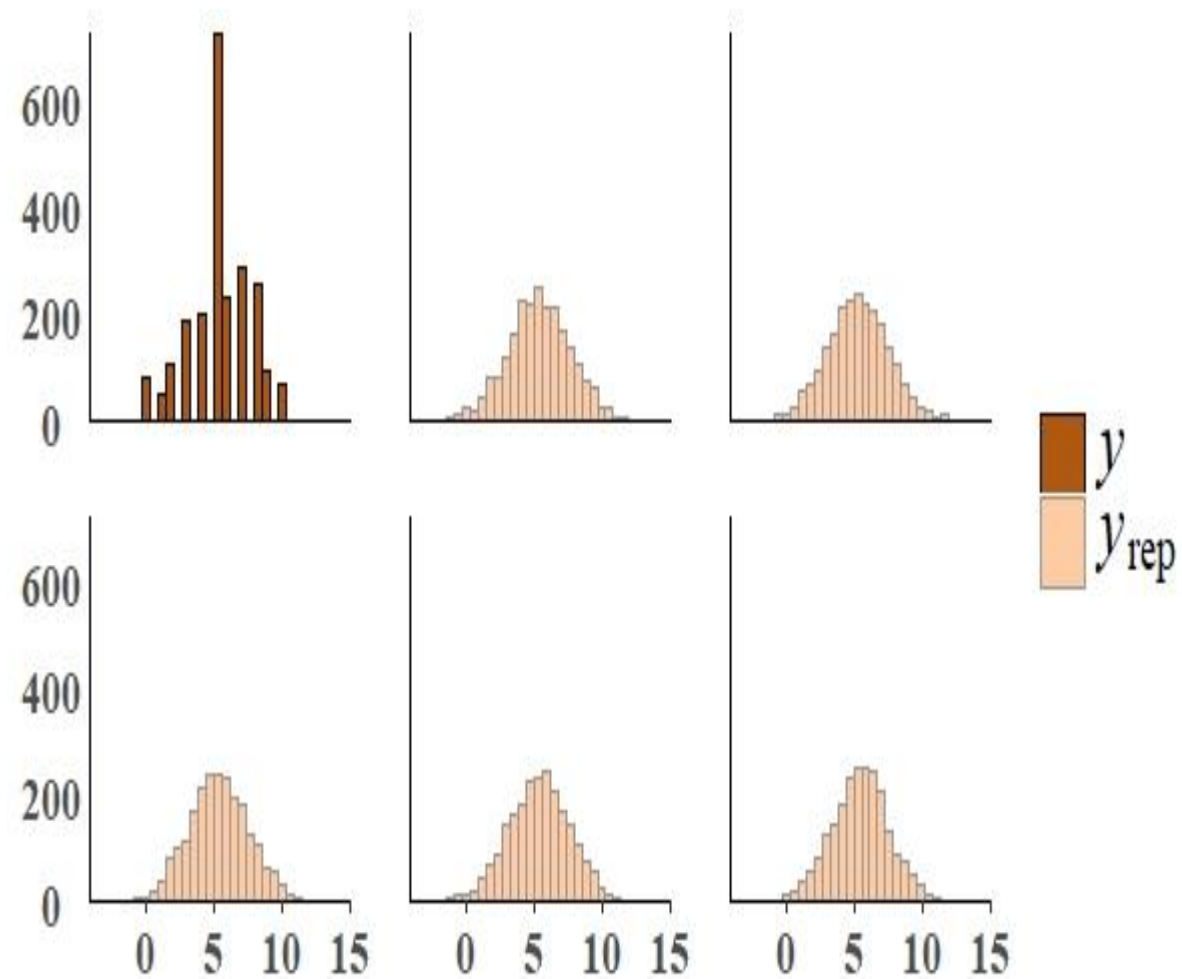
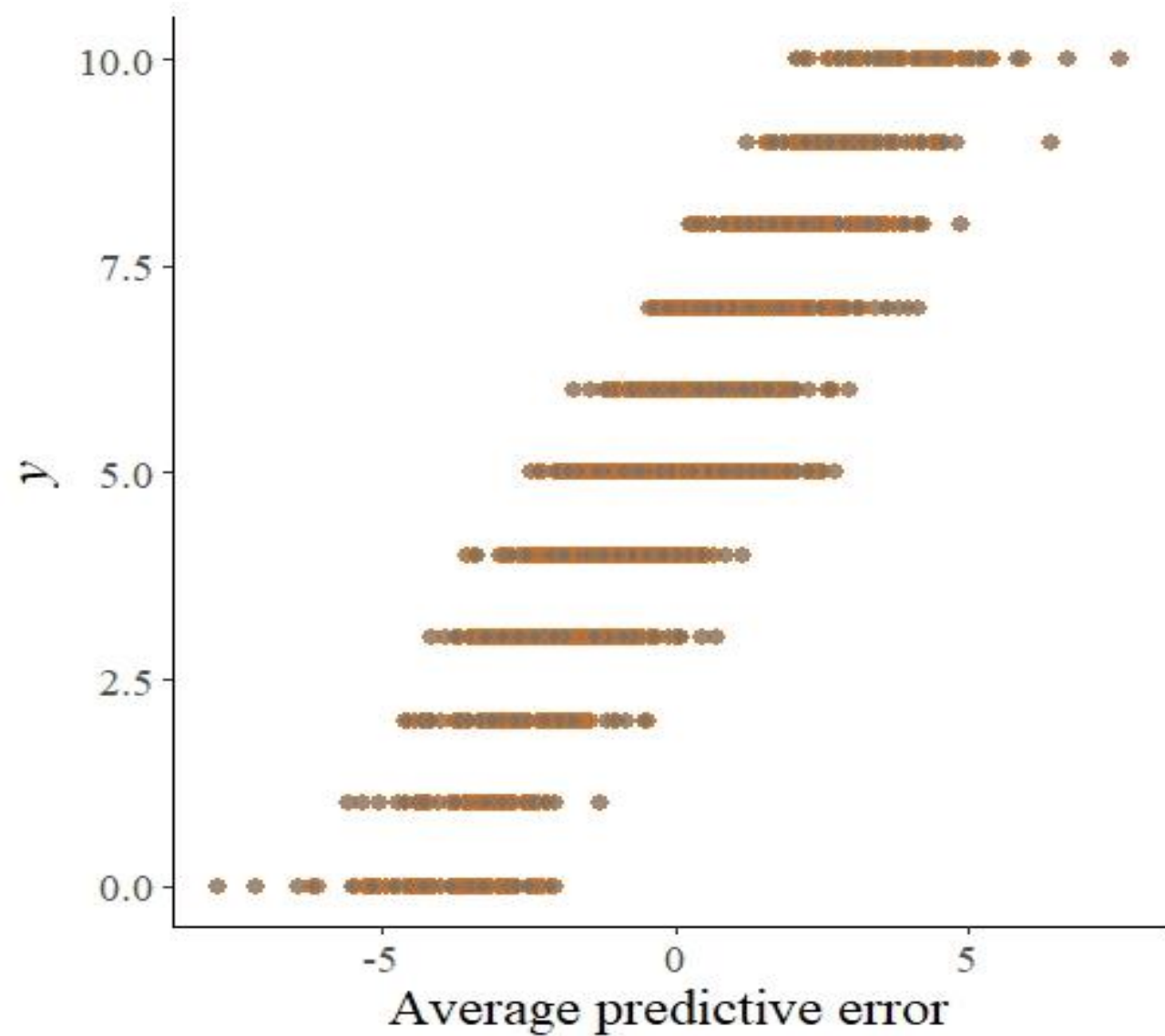# POSTERIOR PREDICTED CHECKS: REPLICATED AND OBSERVED VALUES
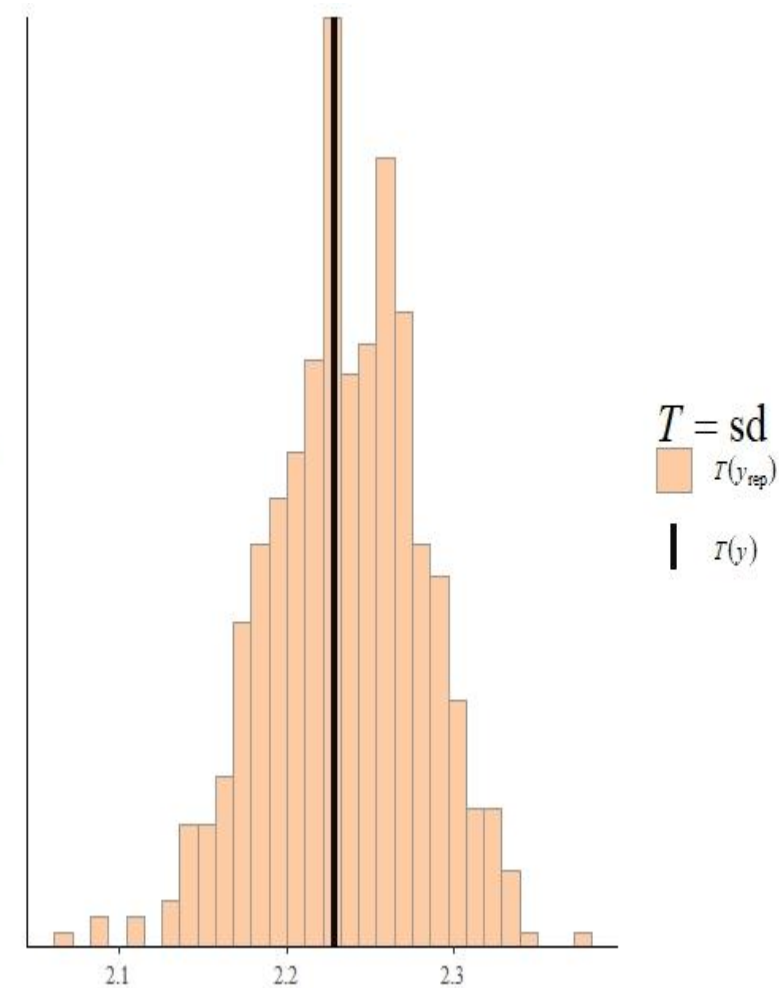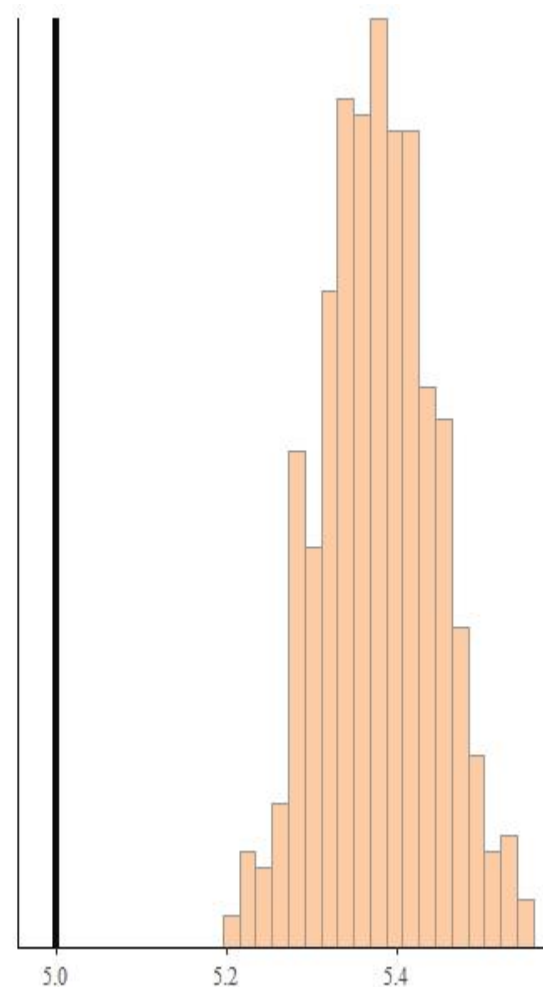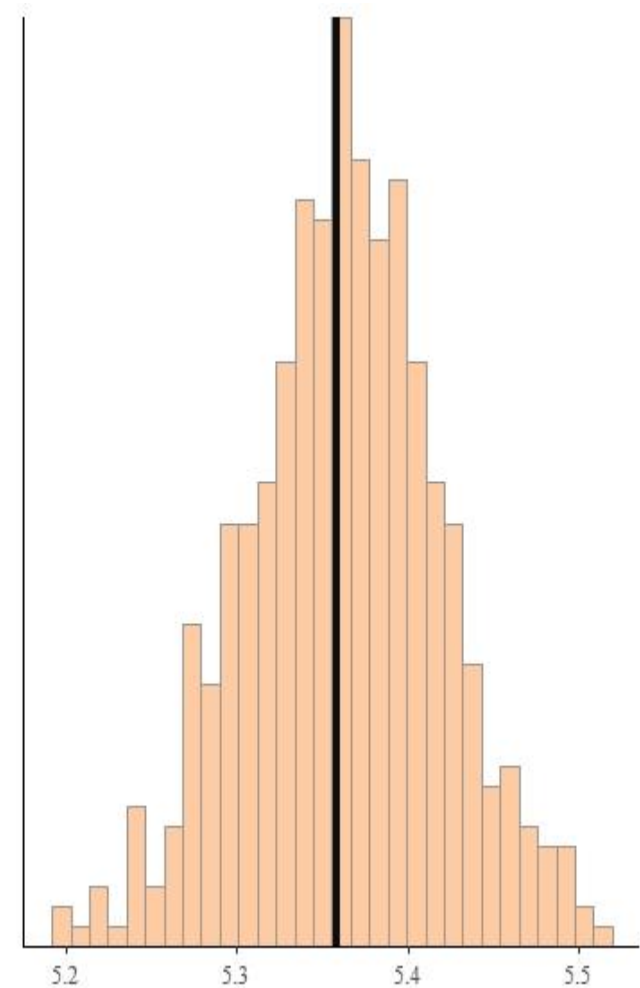
POSTERIOR PREDICTIVE CHECKS: 2D HISTOGRAM

$T = (\text{mean}, \text{sd})$

● $T(y)$
○ $T(y_{\text{rep}})$

AVERAGE PREDICTED ERROR

Bayes Factors for Stan Models without Tears

```
> bf_nest1/bf_full
Bayes factor analysis
--------------
[1] trstprl + trstlgl + trstplc + ppltrst + pplfair : 2.950063 ±0.01%

Against denominator:
  imwbcnt ~ trstprl + trstlgl + trstplc + ppltrst + pplfair + pplhlp
---
Bayes factor type: BFlinearModel, JZS

> bf_nest2/bf_full
Bayes factor analysis
--------------
[1] trstprl + trstlgl + trstplc + ppltrst + pplhlp : 0.9805195 ±0.01%

Against denominator:
  imwbcnt ~ trstprl + trstlgl + trstplc + ppltrst + pplfair + pplhlp
---
Bayes factor type: BFlinearModel, JZS
```
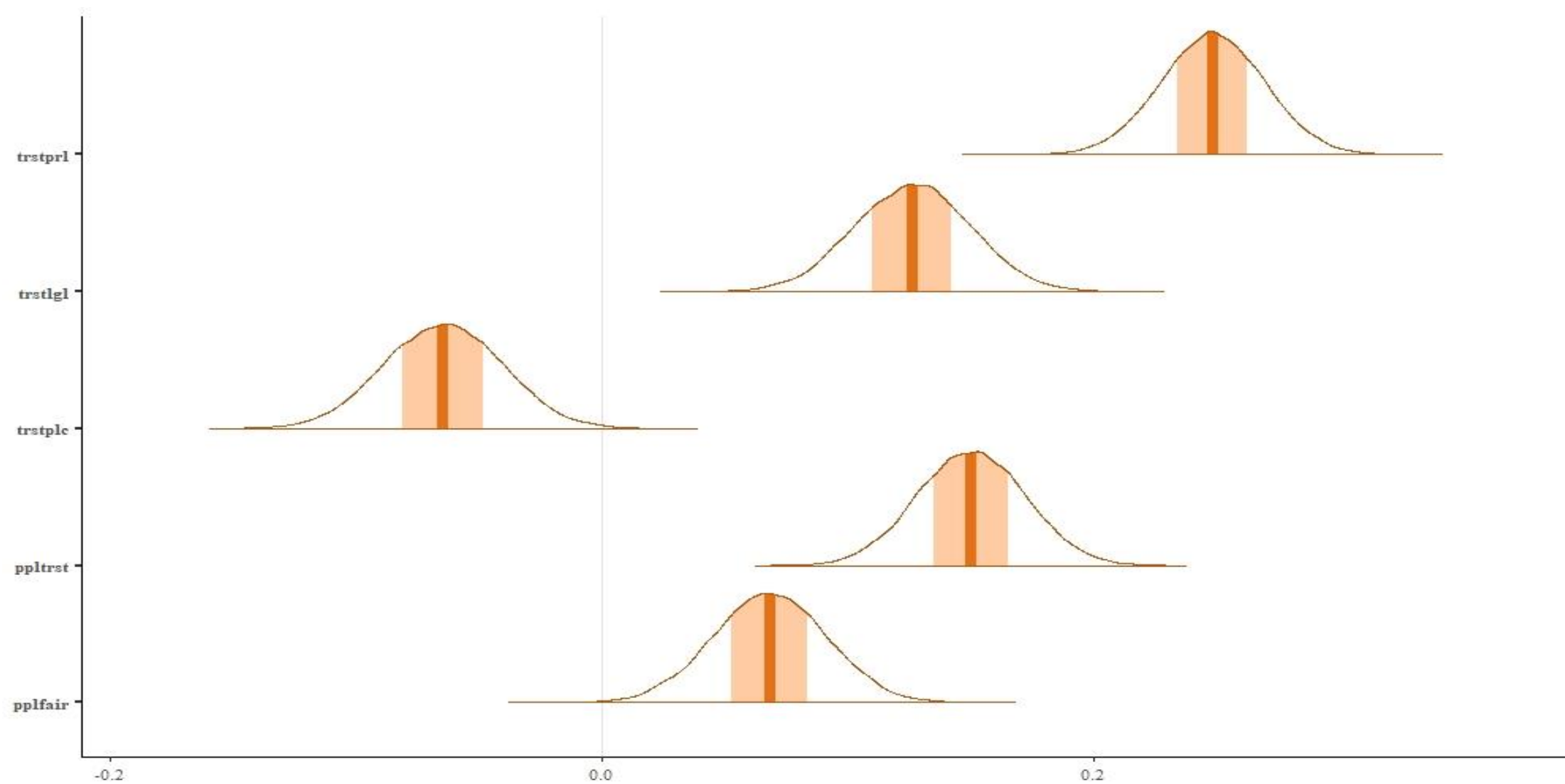
FINAL MODEL

term	estimate	std.error	conf.low	conf.high
(Intercept)	2.540	0.178	2.193	2.890
trstprl	0.248	0.021	0.207	0.290
trstlgl	0.126	0.024	0.080	0.172
trstplc	-0.064	0.024	-0.112	-0.018
ppltrst	0.150	0.022	0.107	0.193
pplfair	0.068	0.023	0.023	0.113
sigma	1.990	0.029	1.934	2.049

FINAL MODEL

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