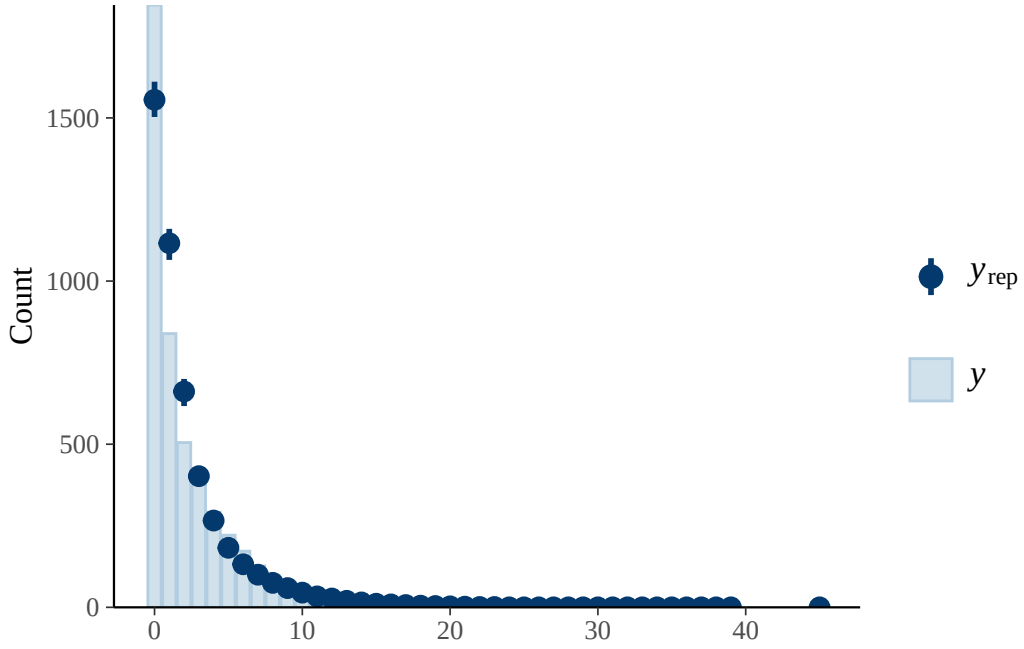
ABCD ADHD menarche analysis: Output for longitudinal models

Model 1 longitudinal output

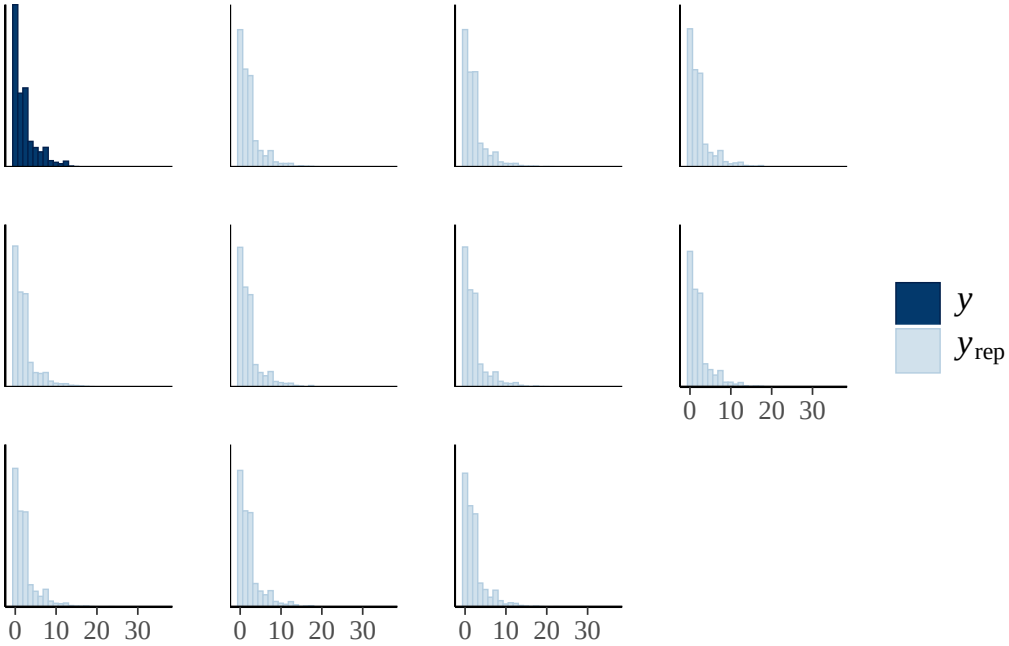
```
    Estimate   Est.Error      Q2.5     Q97.5
R2 0.7418134 0.006873688 0.7280536 0.7551324


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_attention_r_wave_3 ~ menarche_status_p_wave_2 + age_years_c_wave_2 + et
   Data: imp_df_wide (Number of observations: 4740)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4111)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.8517    0.0193   0.8143   0.8898 1.0005     2423     4196

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.0972    0.0350   0.0276   0.1694 1.0013     1157     1009

Regression Coefficients:
                                Estimate Est.Error l-95% CI u-95% CI   Rhat
Intercept                         0.2556    0.0415   0.1750   0.3374 1.0000
menarche_status_p_wave_2Y         0.0981    0.0382   0.0253   0.1745 1.0005
age_years_c_wave_2               -0.0567    0.0284  -0.1127  -0.0014 1.0002
ethnicity2                       -0.0491    0.0607  -0.1693   0.0685 0.9999
ethnicity3                       -0.0297    0.0561  -0.1407   0.0795 0.9999
ethnicity4                       -0.2330    0.1317  -0.4973   0.0278 1.0000
```

```
ethnicity5                          0.0897    0.0595  -0.0268   0.2048 1.0001
inr_c_wave_0                        0.0130    0.0062   0.0009   0.0250 1.0000
cbcl_scr_syn_attention_r_c_wave_0   0.2125    0.0050   0.2025   0.2224 1.0015
                                  Bulk_ESS Tail_ESS
Intercept                             4015     4806
menarche_status_p_wave_2Y             4430     5728
age_years_c_wave_2                    4537     5820
ethnicity2                            3513     4826
ethnicity3                            3408     4643
ethnicity4                            4761     6195
ethnicity5                            3769     5070
inr_c_wave_0                          4011     5474
cbcl_scr_syn_attention_r_c_wave_0     2945     4548

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).
```

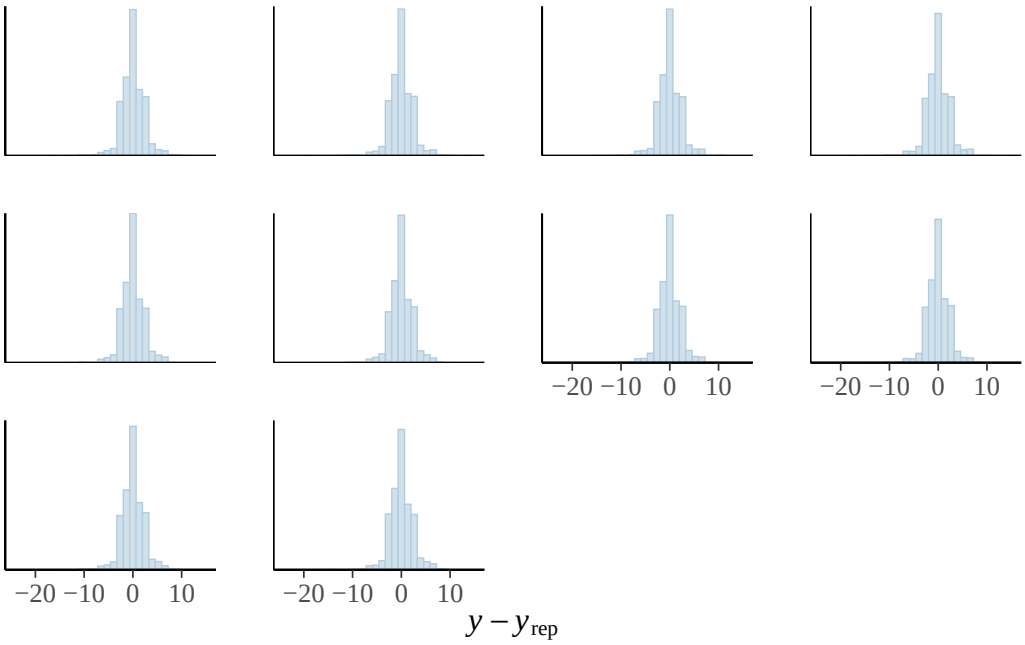
Model 1 long posterior predictive diagnostics



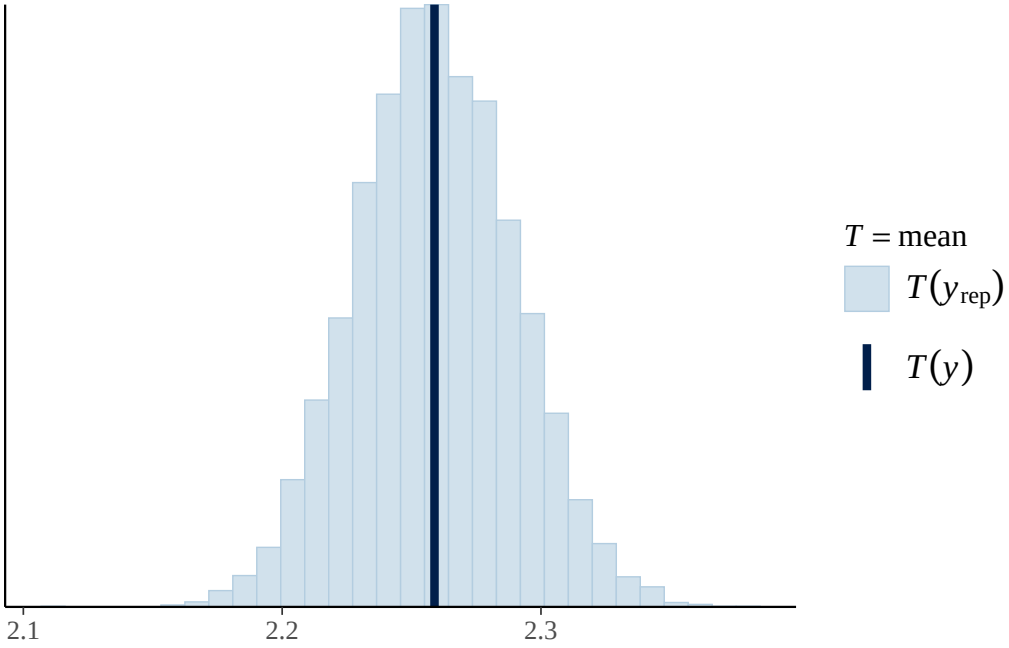

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



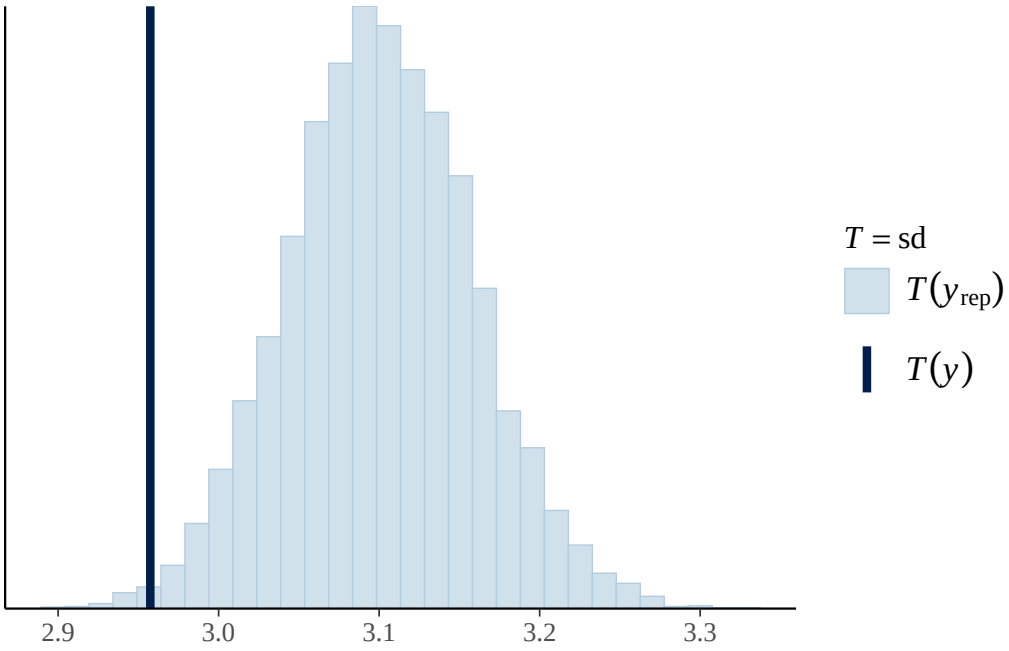
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.

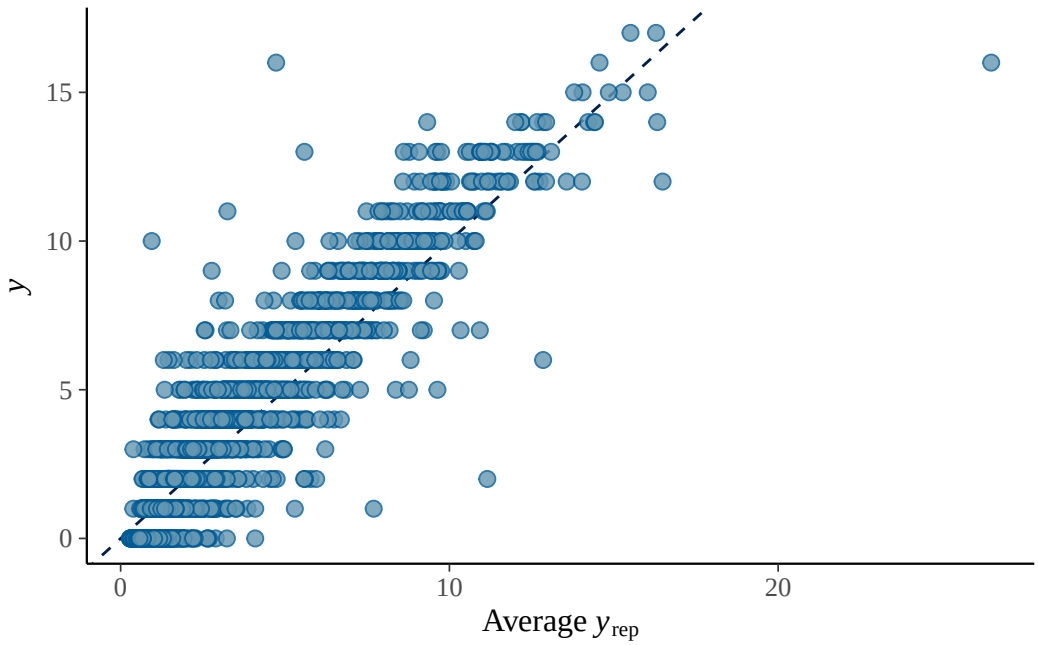


`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.




```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```





Model 1b longitudinal output

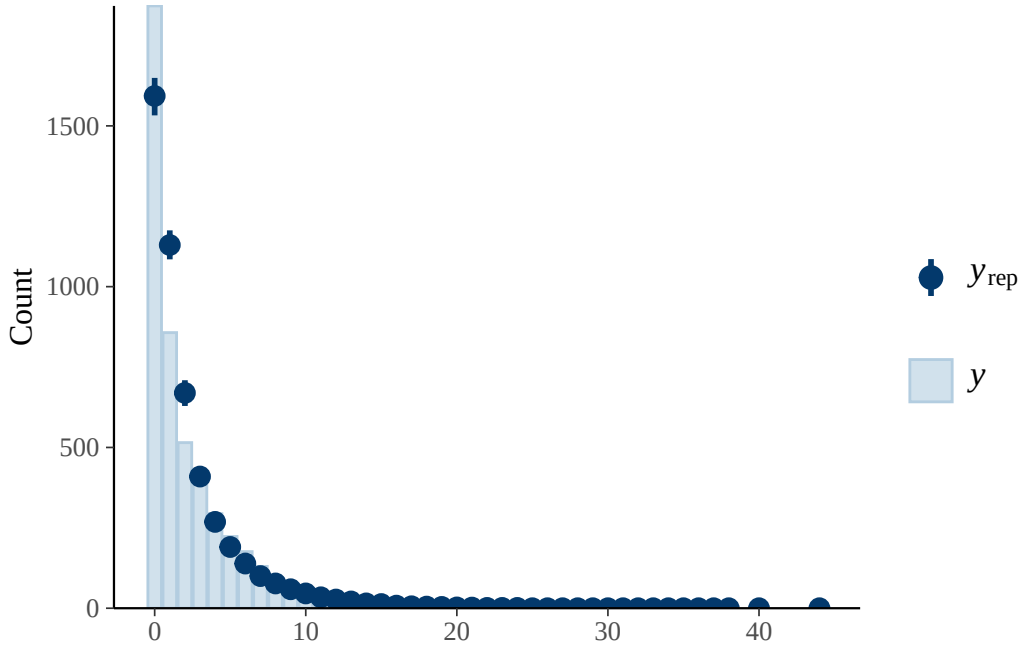
```
    Estimate   Est.Error      Q2.5     Q97.5
R2 0.7424201 0.006876715 0.7285853 0.7556533


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_attention_r_wave_3 ~ pds_f4_p_c_wave_2 + age_years_c_wave_2 + ethnicity
   Data: imp_df_wide (Number of observations: 4820)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4177)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.8520    0.0186   0.8154   0.8885 1.0014     2538     4128

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.0992    0.0337   0.0353   0.1689 1.0023     1391     1426

Regression Coefficients:
```

	Estimate	Est.Error	l-95% CI	u-95% CI	Rhat
Intercept	0.2731	0.0400	0.1947	0.3507	1.0009
pds_f4_p_c_wave_2	0.1087	0.0288	0.0517	0.1659	1.0003
age_years_c_wave_2	-0.0545	0.0272	-0.1072	-0.0017	0.9998
ethnicity2	-0.0608	0.0597	-0.1766	0.0547	1.0006
ethnicity3	-0.0334	0.0542	-0.1378	0.0736	1.0001
ethnicity4	-0.2520	0.1348	-0.5186	0.0124	0.9999
ethnicity5	0.0631	0.0589	-0.0526	0.1803	1.0009
inr_c_wave_0	0.0116	0.0061	-0.0005	0.0236	1.0001
cbcl_scr_syn_attention_r_c_wave_0	0.2113	0.0050	0.2013	0.2212	1.0005

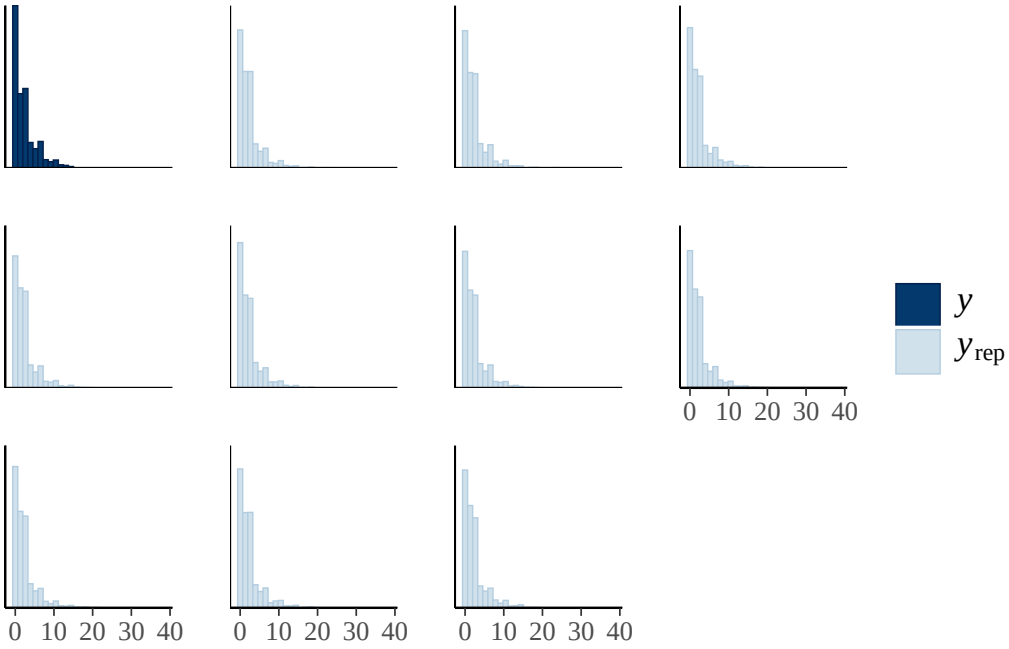
	Bulk_ESS	Tail_ESS
Intercept	4356	5100
pds_f4_p_c_wave_2	4956	5570
age_years_c_wave_2	5075	5621
ethnicity2	3946	5321
ethnicity3	3737	5240
ethnicity4	5294	6003
ethnicity5	3741	4969
inr_c_wave_0	3891	5699
cbcl_scr_syn_attention_r_c_wave_0	3214	4696

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).

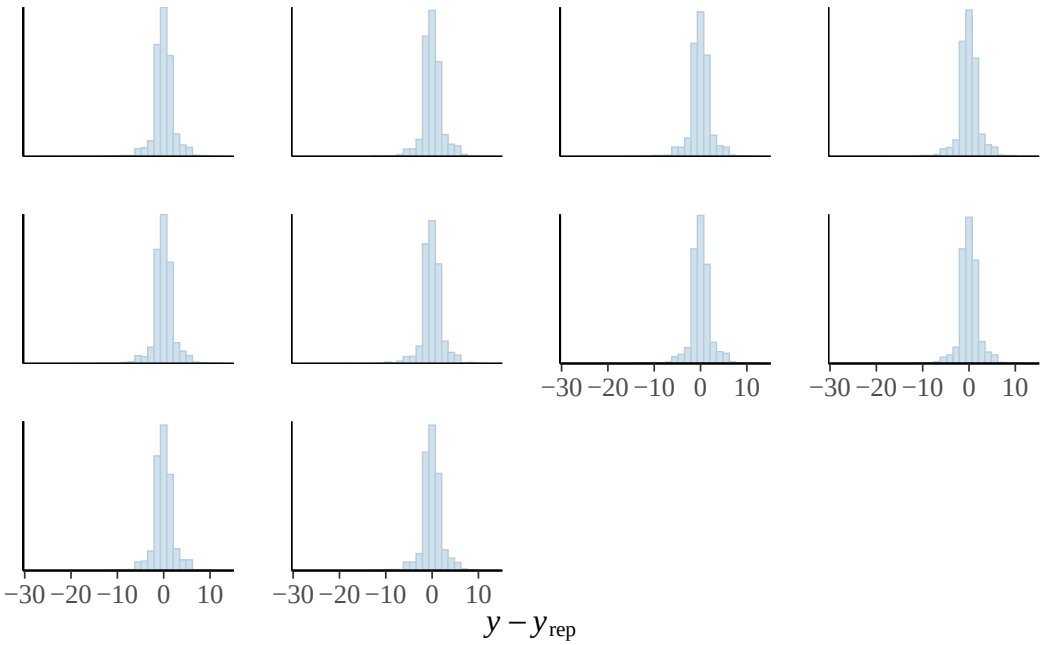
Model 1b long posterior predictive diagnostics



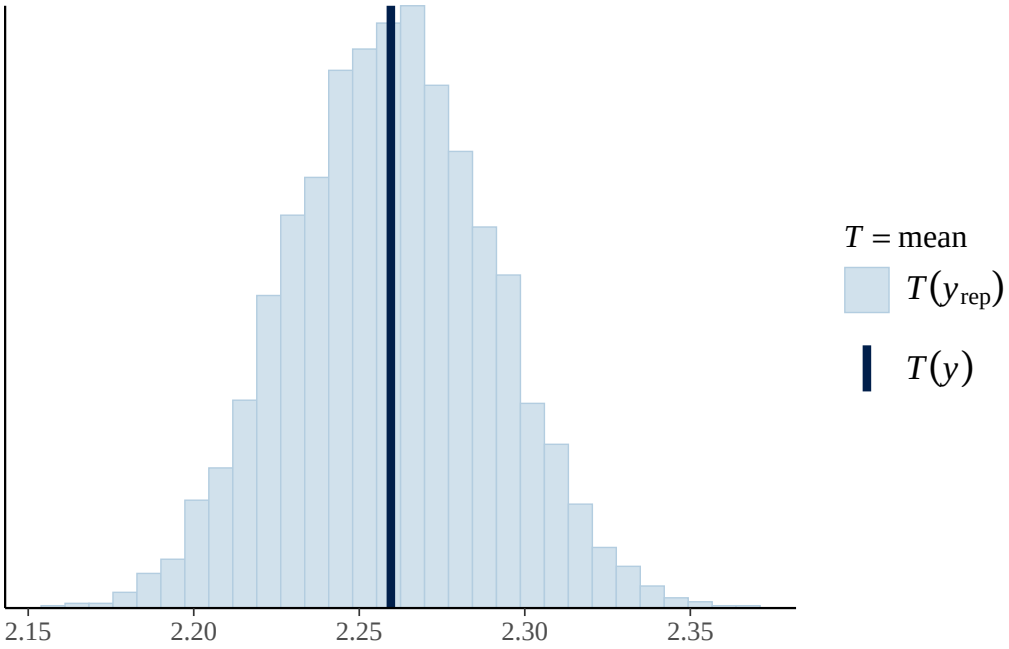

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



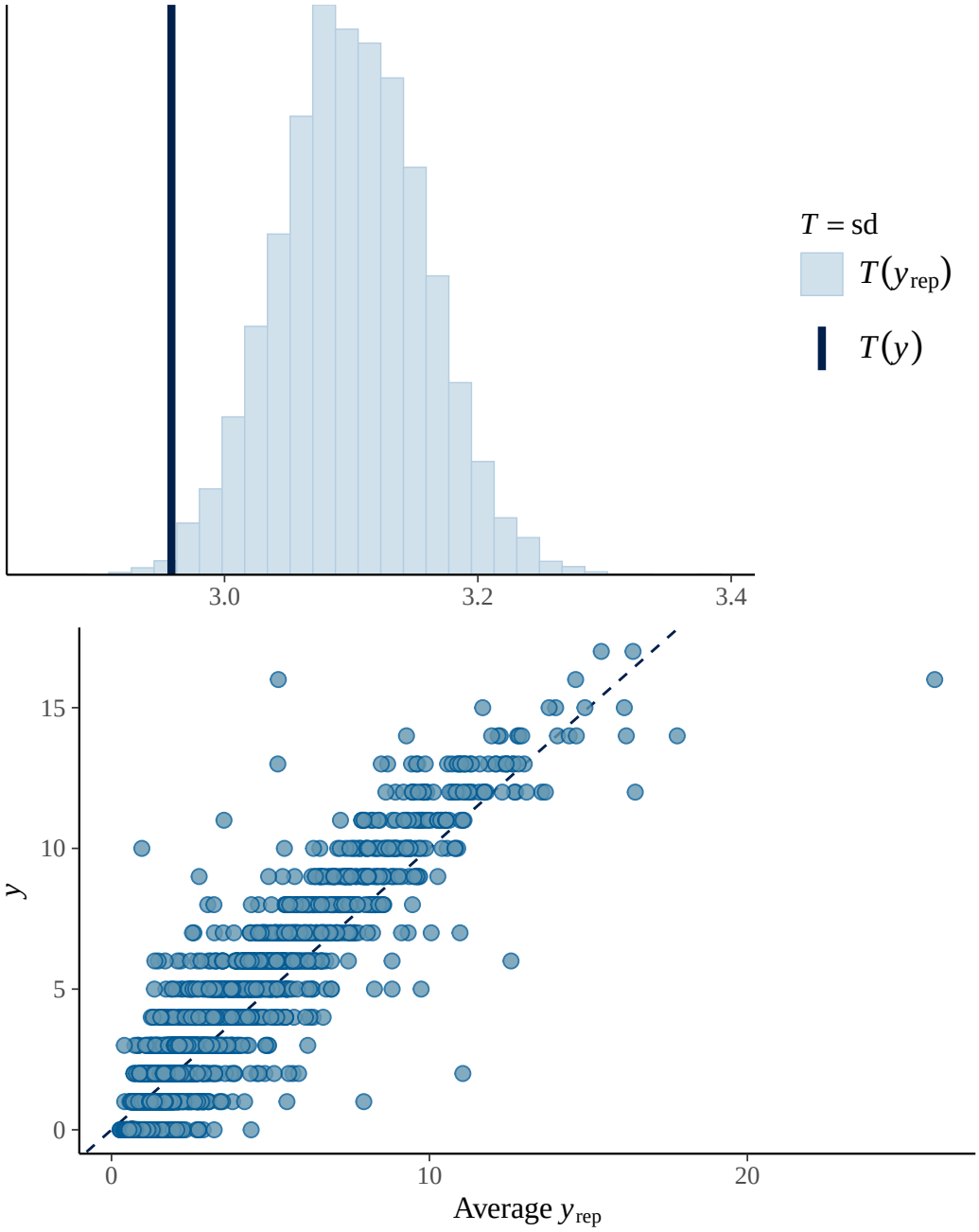
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

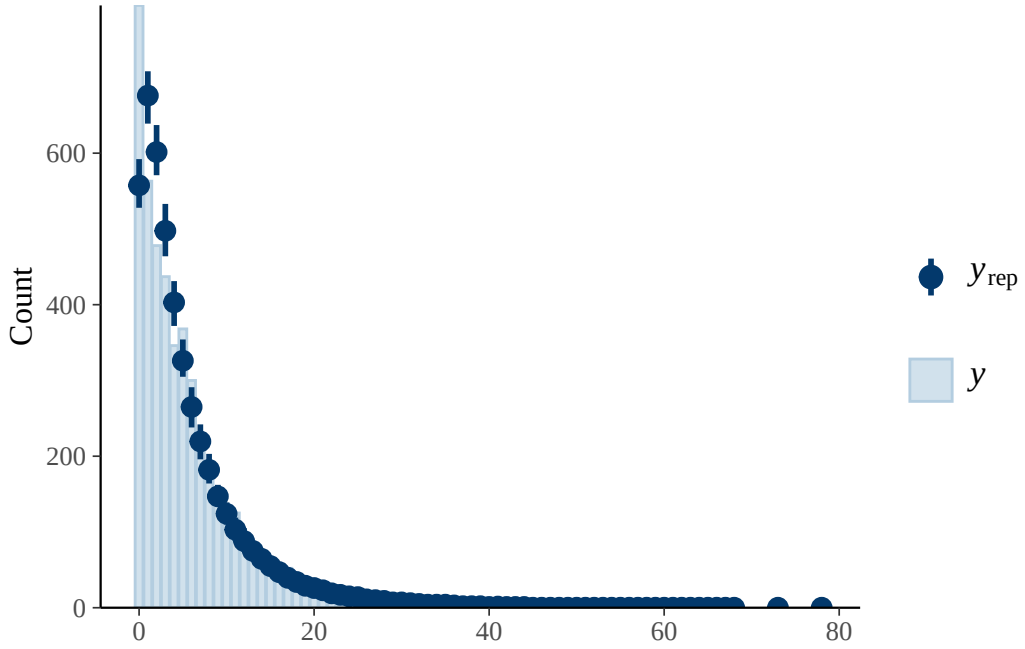


Model 2 longitudinal output

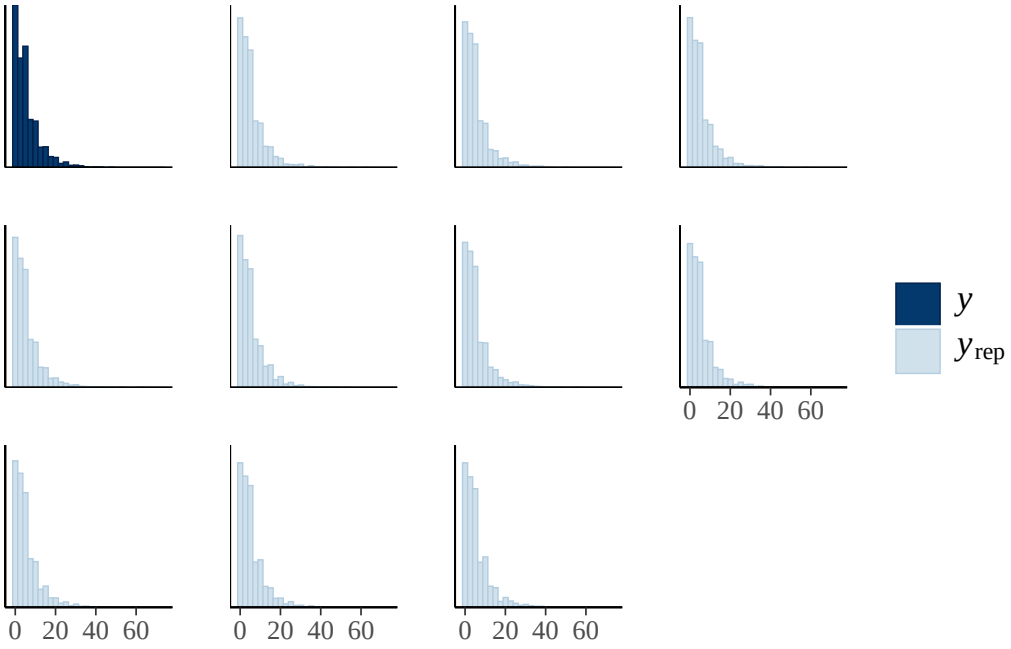
```
    Estimate   Est.Error      Q2.5     Q97.5
R2 0.8349721 0.004261904 0.8261703 0.8430774


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_internal_r_wave_3 ~ menarche_status_p_wave_2 * adhd_diagnosis_wave_0 +
   Data: imp_df_wide (Number of observations: 4740)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4111)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.8292    0.0142   0.8014   0.8575 1.0012     2054     3735

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.1089    0.0305   0.0575   0.1773 1.0002      968     1589

Regression Coefficients:
                                                Estimate Est.Error l-95% CI
Intercept                                         1.2475    0.0368   1.1750
menarche_status_p_wave_2Y                         0.1795    0.0325   0.1154
adhd_diagnosis_wave_0                             0.2525    0.0392   0.1779
age_years_c_wave_2                                0.0034    0.0224  -0.0407
ethnicity2                                       -0.4020    0.0521  -0.5052
ethnicity3                                       -0.0751    0.0473  -0.1670
ethnicity4                                       -0.3720    0.1081  -0.5866
ethnicity5                                        0.0986    0.0509  -0.0017
inr_c_wave_0                                      0.0152    0.0050   0.0053
cbcl_scr_syn_internal_r_c_wave_0                  0.0763    0.0024   0.0715
menarche_status_p_wave_2Y:adhd_diagnosis_wave_0   0.0623    0.0597  -0.0573
                                                u-95% CI   Rhat Bulk_ESS
Intercept                                         1.3196 1.0017     2573
menarche_status_p_wave_2Y                         0.2421 1.0010     2530
adhd_diagnosis_wave_0                             0.3325 1.0008     2165
age_years_c_wave_2                                0.0475 1.0002     2515
ethnicity2                                       -0.3003 1.0031     2150
ethnicity3                                        0.0172 1.0002     1602
ethnicity4                                       -0.1594 1.0004     2640
```

```
ethnicity5                                          0.1998 1.0003     1657
inr_c_wave_0                                        0.0250 1.0009     2131
cbcl_scr_syn_internal_r_c_wave_0                    0.0809 1.0012     1755
menarche_status_p_wave_2Y:adhd_diagnosis_wave_0     0.1766 1.0006     2159
                                                   Tail_ESS
Intercept                                              4074
menarche_status_p_wave_2Y                              4251
adhd_diagnosis_wave_0                                  3675
age_years_c_wave_2                                     4364
ethnicity2                                             3202
ethnicity3                                             3364
ethnicity4                                             4479
ethnicity5                                             2807
inr_c_wave_0                                           3696
cbcl_scr_syn_internal_r_c_wave_0                       3135
menarche_status_p_wave_2Y:adhd_diagnosis_wave_0        4194

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).
```

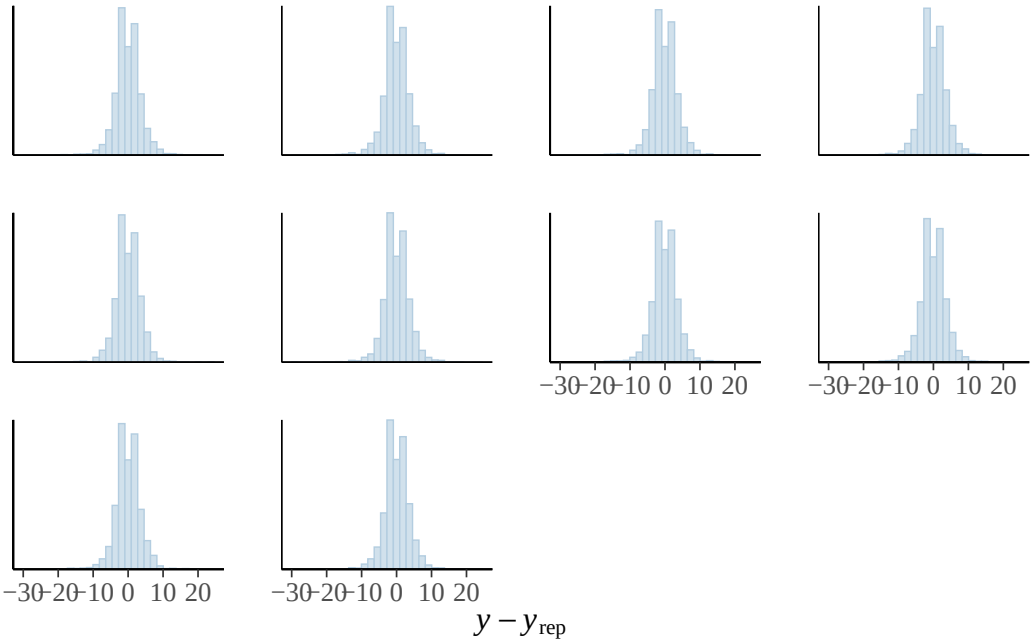
Model 2 long posterior predictive diagnostics



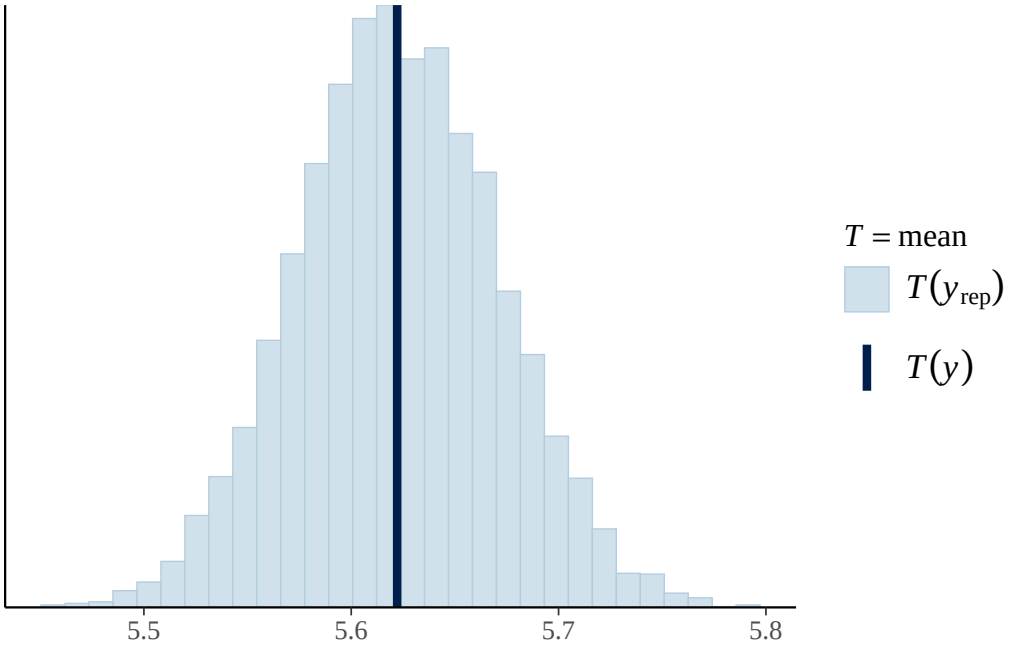
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



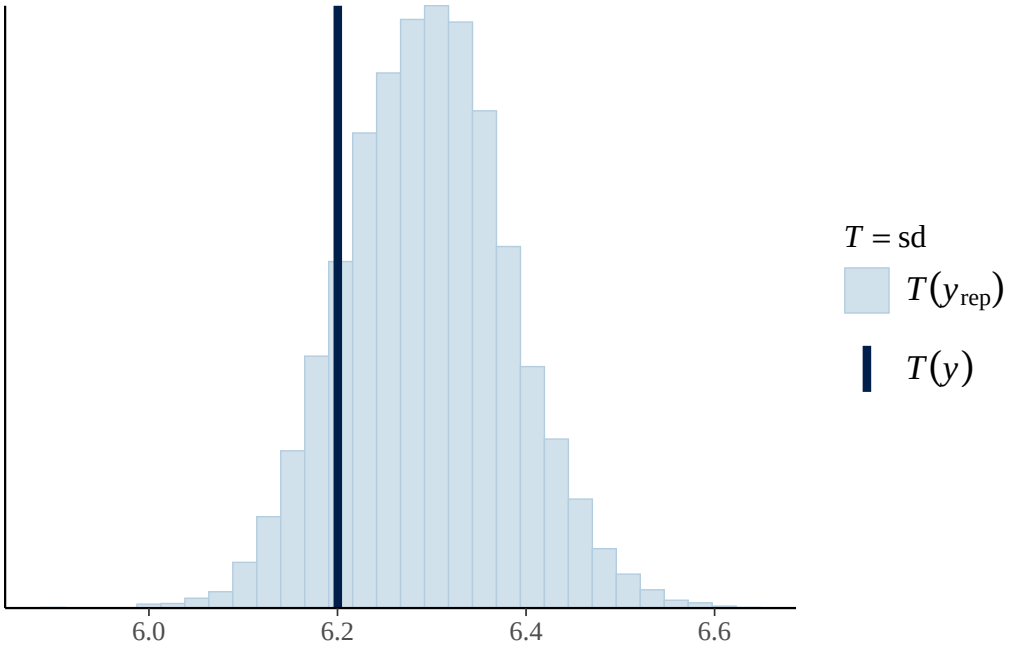
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.

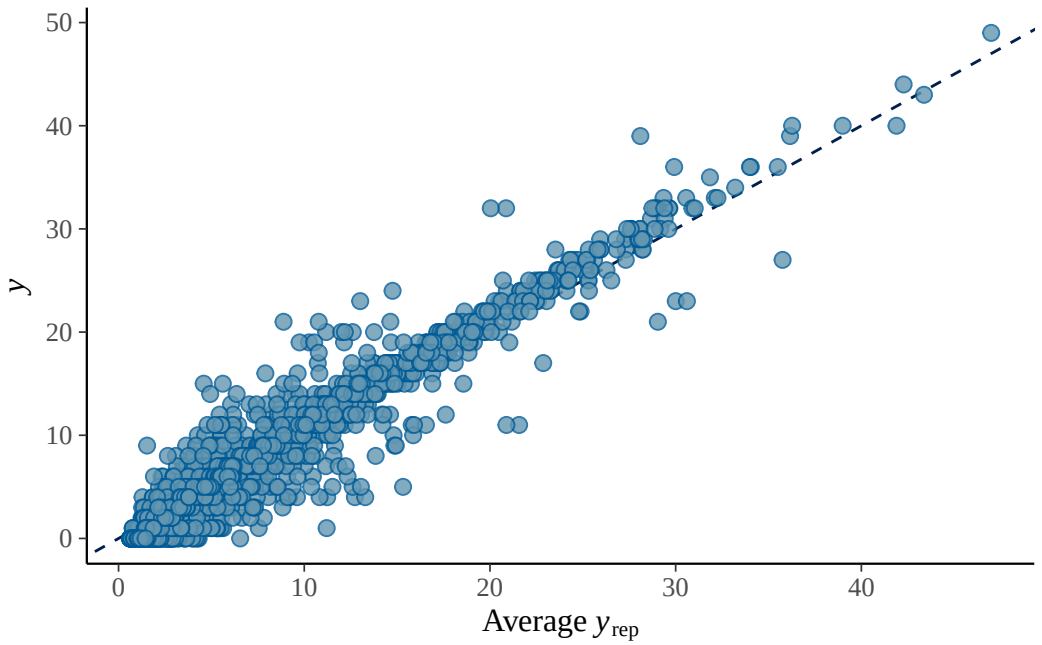


`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.





Model 2b longitudinal output

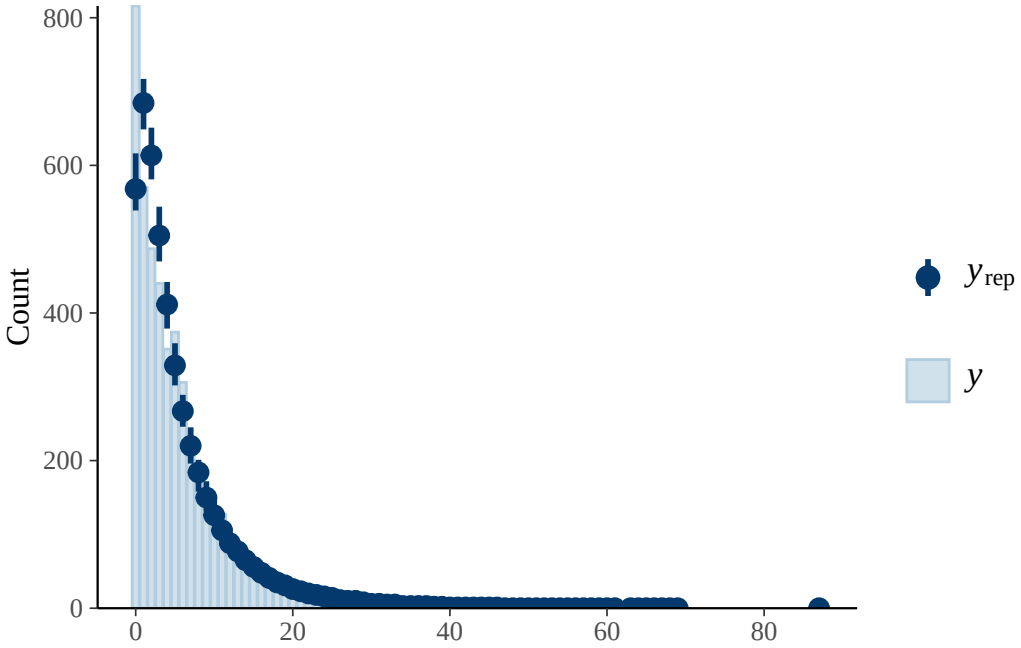
```
   Estimate   Est.Error      Q2.5     Q97.5
R2 0.836086 0.004060193 0.8278617 0.8437899


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_internal_r_wave_3 ~ pds_f4_p_c_wave_2 * adhd_diagnosis + age_years_c_wa
   Data: imp_df_wide (Number of observations: 4820)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4177)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.8355    0.0142   0.8075   0.8635 1.0017     1824     3339

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.1090    0.0306   0.0558   0.1763 1.0022      797     1166

Regression Coefficients:
```

	Estimate	Est.Error	l-95% CI	u-95% CI	Rhat
Intercept	1.2780	0.0366	1.2050	1.3489	1.0003
pds_f4_p_c_wave_2	0.1154	0.0240	0.0679	0.1622	1.0000
adhd_diagnosis1	0.2428	0.0340	0.1761	0.3107	1.0006
age_years_c_wave_2	0.0269	0.0211	-0.0146	0.0685	1.0008
ethnicity2	-0.3824	0.0526	-0.4859	-0.2796	1.0020
ethnicity3	-0.0608	0.0472	-0.1533	0.0297	1.0013
ethnicity4	-0.3672	0.1092	-0.5785	-0.1561	0.9999
ethnicity5	0.0813	0.0495	-0.0143	0.1782	1.0007
inr_c_wave_0	0.0130	0.0051	0.0031	0.0232	1.0010
cbcl_scr_syn_internal_r_c_wave_0	0.0769	0.0024	0.0721	0.0817	1.0016
pds_f4_p_c_wave_2:adhd_diagnosis1	0.0377	0.0471	-0.0541	0.1292	1.0016

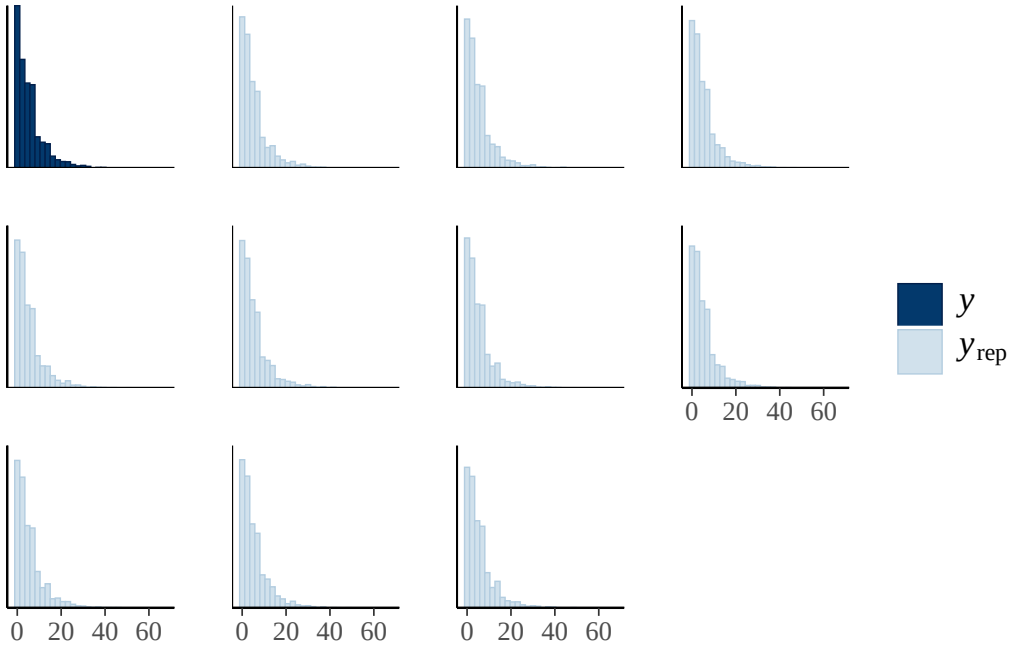
	Bulk_ESS	Tail_ESS
Intercept	1597	3098
pds_f4_p_c_wave_2	2096	3744
adhd_diagnosis1	2189	3691
age_years_c_wave_2	1857	3501
ethnicity2	1500	2884
ethnicity3	1206	2643
ethnicity4	2219	3826
ethnicity5	1397	2762
inr_c_wave_0	1591	2944
cbcl_scr_syn_internal_r_c_wave_0	1405	2359
pds_f4_p_c_wave_2:adhd_diagnosis1	2091	3969

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).

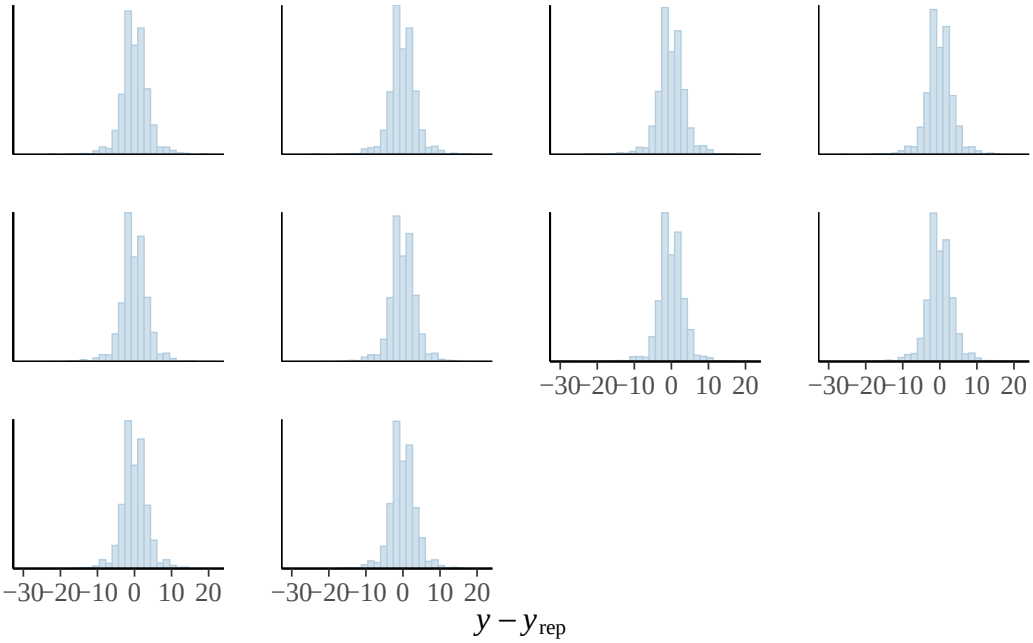
Model 2b long posterior predictive diagnostics



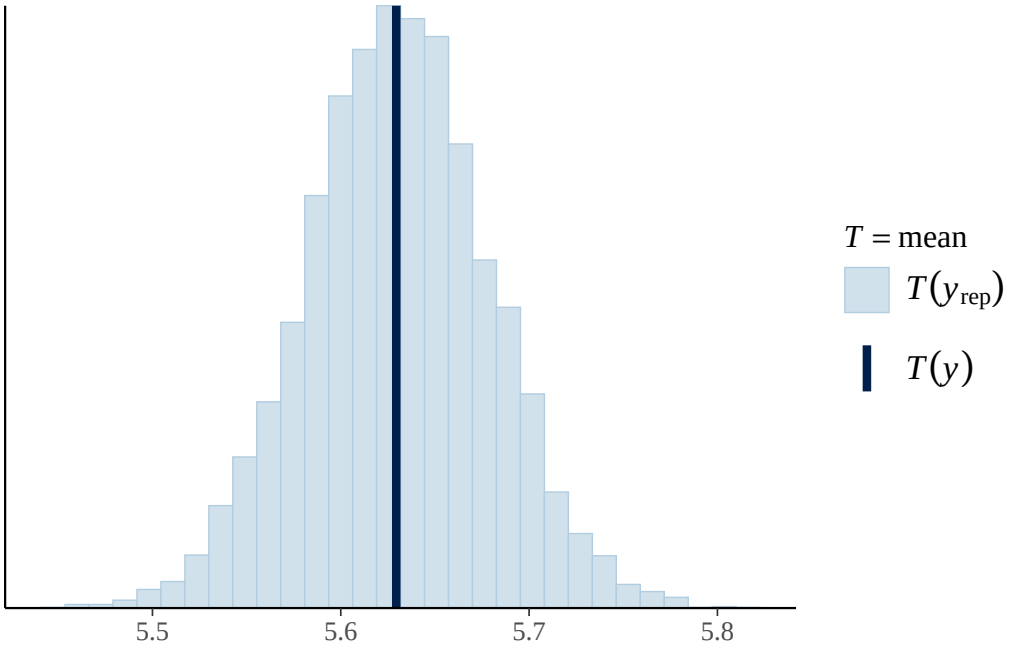

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



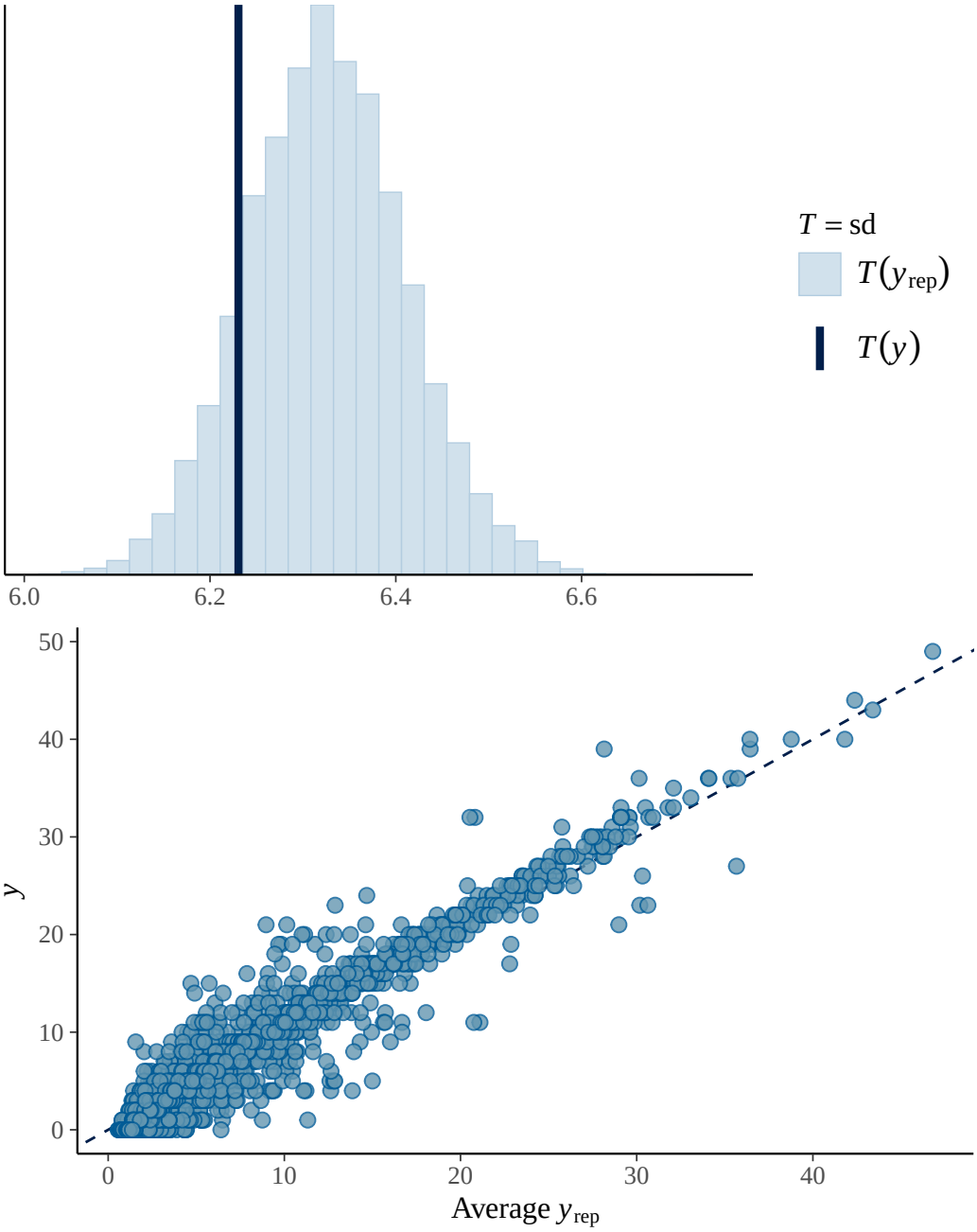
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

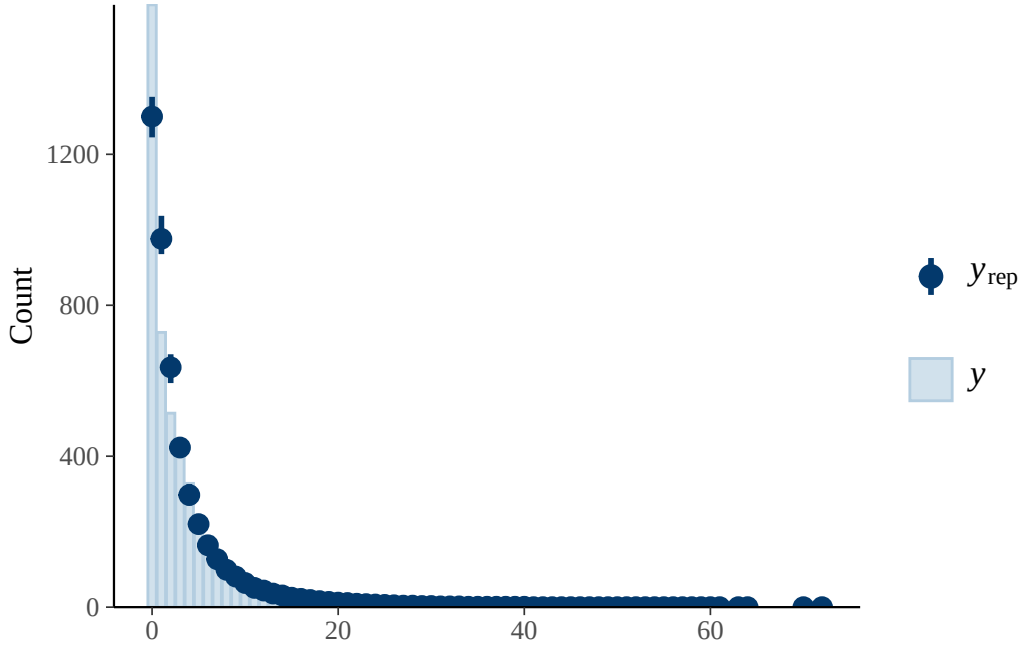


Model 3 longitudinal output

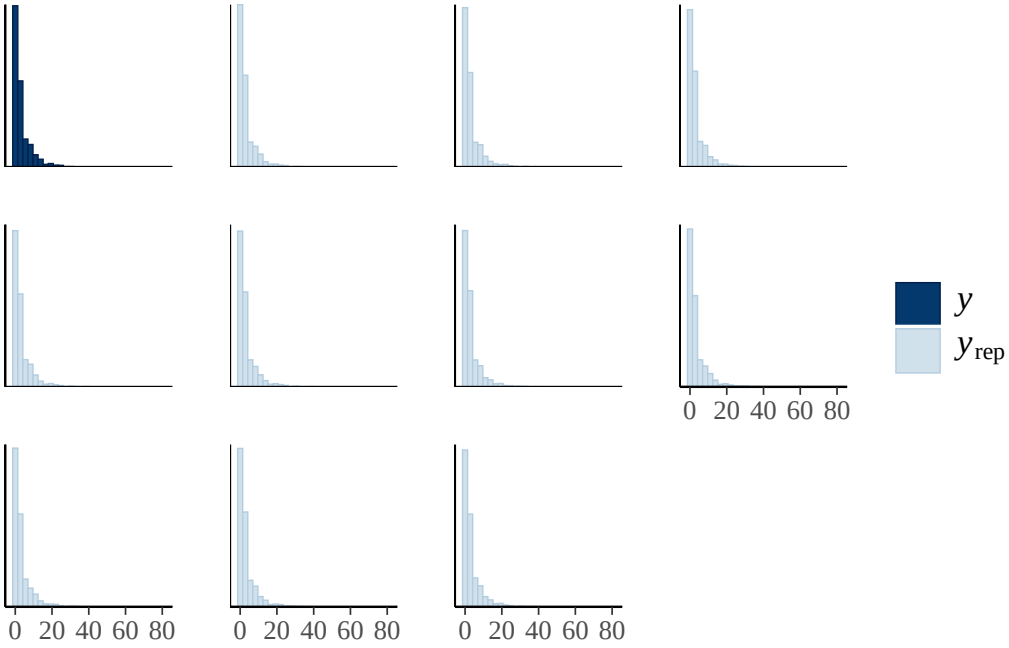
```
    Estimate   Est.Error      Q2.5    Q97.5
R2 0.8262111 0.004705192 0.8167211 0.834972


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_external_r_wave_3 ~ menarche_status_p_wave_2 * adhd_diagnosis + age_yea
   Data: imp_df_wide (Number of observations: 4740)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4111)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.9962    0.0193   0.9597   1.0355 1.0004     1800     3623

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.0871    0.0377   0.0171   0.1649 1.0009      499      965

Regression Coefficients:
                                         Estimate Est.Error l-95% CI u-95% CI
Intercept                                  0.4512    0.0419   0.3684   0.5333
menarche_status_p_wave_2Y                  0.1585    0.0435   0.0732   0.2441
adhd_diagnosis1                            0.4678    0.0494   0.3723   0.5629
age_years_c_wave_2                        -0.0613    0.0282  -0.1191  -0.0080
ethnicity2                                -0.1213    0.0626  -0.2440   0.0024
ethnicity3                                -0.0844    0.0573  -0.1950   0.0273
ethnicity4                                -0.4363    0.1389  -0.7096  -0.1684
ethnicity5                                 0.0375    0.0624  -0.0869   0.1558
inr_c_wave_0                              -0.0021    0.0065  -0.0147   0.0107
cbcl_scr_syn_external_r_c_wave_0           0.0961    0.0032   0.0897   0.1024
menarche_status_p_wave_2Y:adhd_diagnosis1  0.0238    0.0746  -0.1236   0.1691
                                           Rhat Bulk_ESS Tail_ESS
Intercept                                1.0005     2297     3967
menarche_status_p_wave_2Y                0.9999     2457     4165
adhd_diagnosis1                          1.0004     1923     3324
age_years_c_wave_2                       1.0009     1888     3629
ethnicity2                               1.0018     1544     3514
ethnicity3                               1.0011     1822     3384
ethnicity4                               1.0004     3004     4785
```

```
ethnicity5                                    1.0018     1606     3004
inr_c_wave_0                                  1.0007     1760     3251
cbcl_scr_syn_external_r_c_wave_0              1.0007     1188     2464
menarche_status_p_wave_2Y:adhd_diagnosis1 0.9999     1655     3122

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).
```

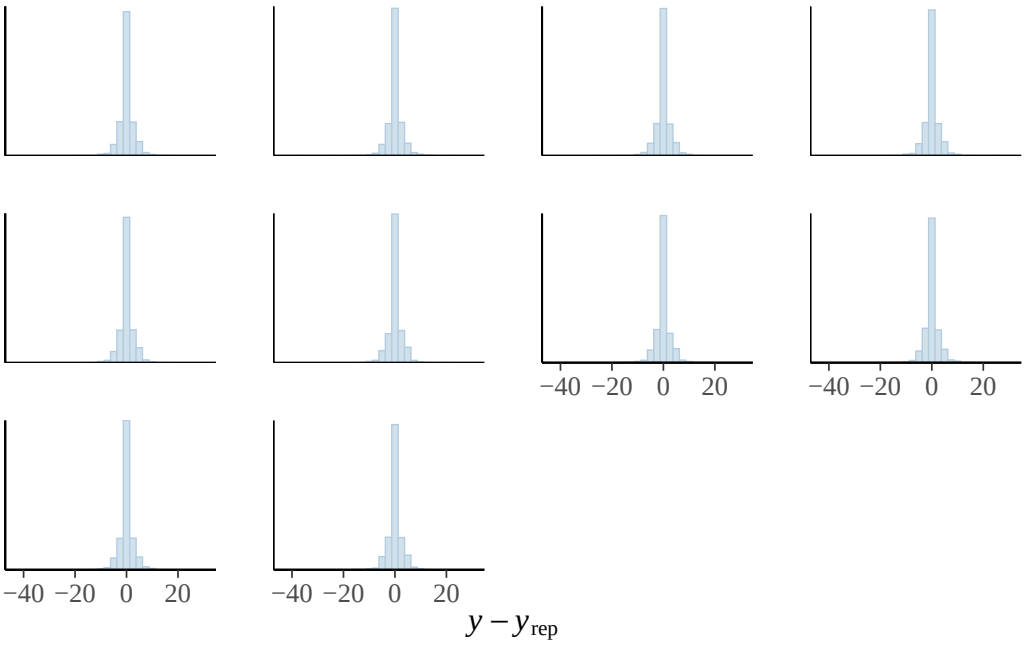
Model 3 long posterior predictive diagnostics



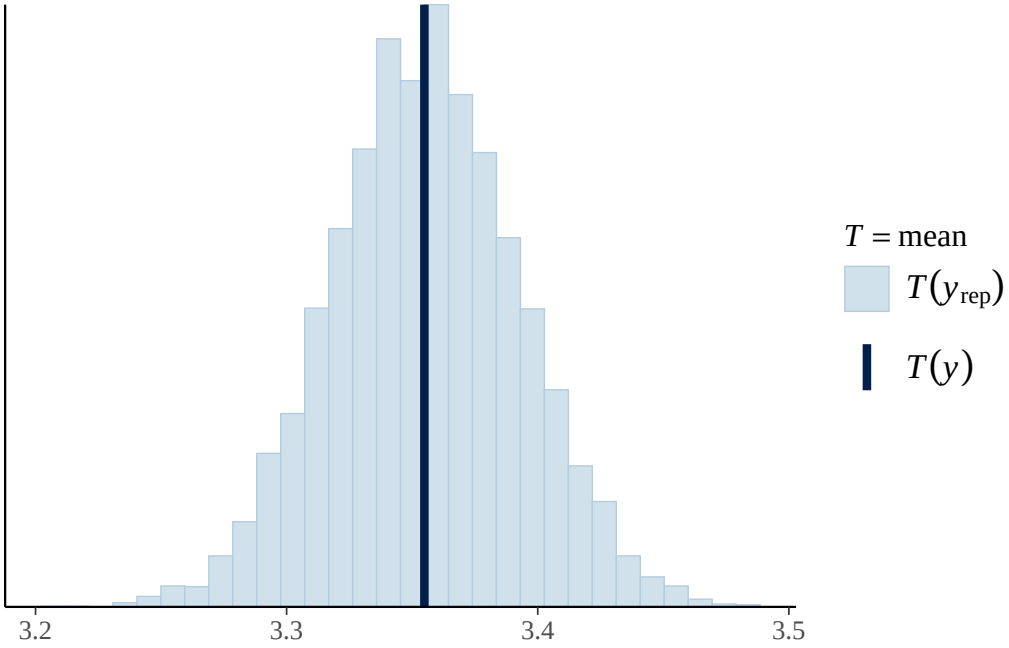

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



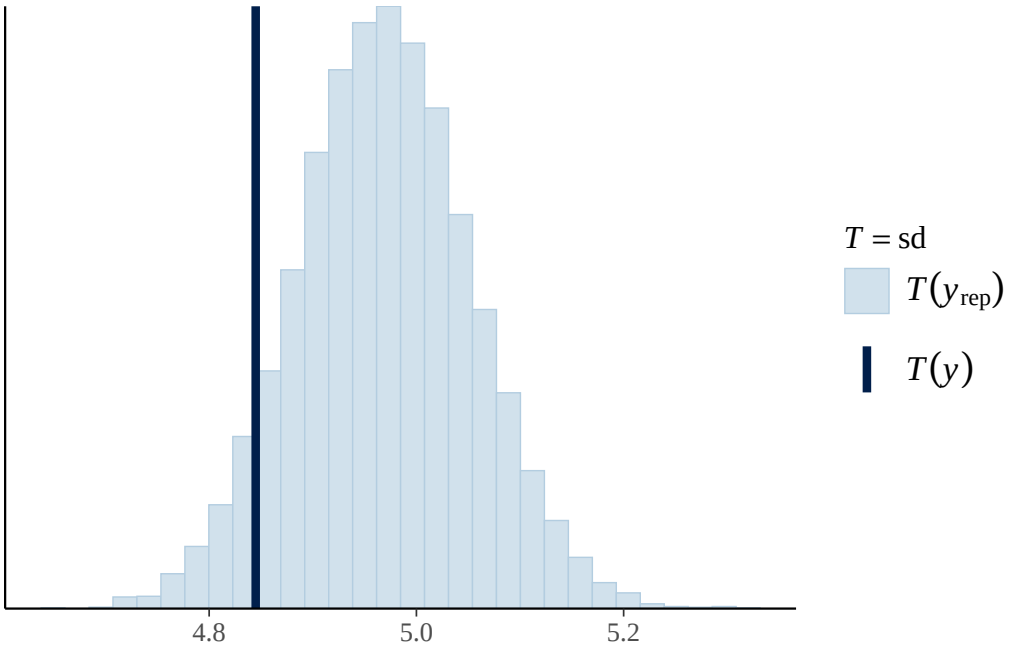

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

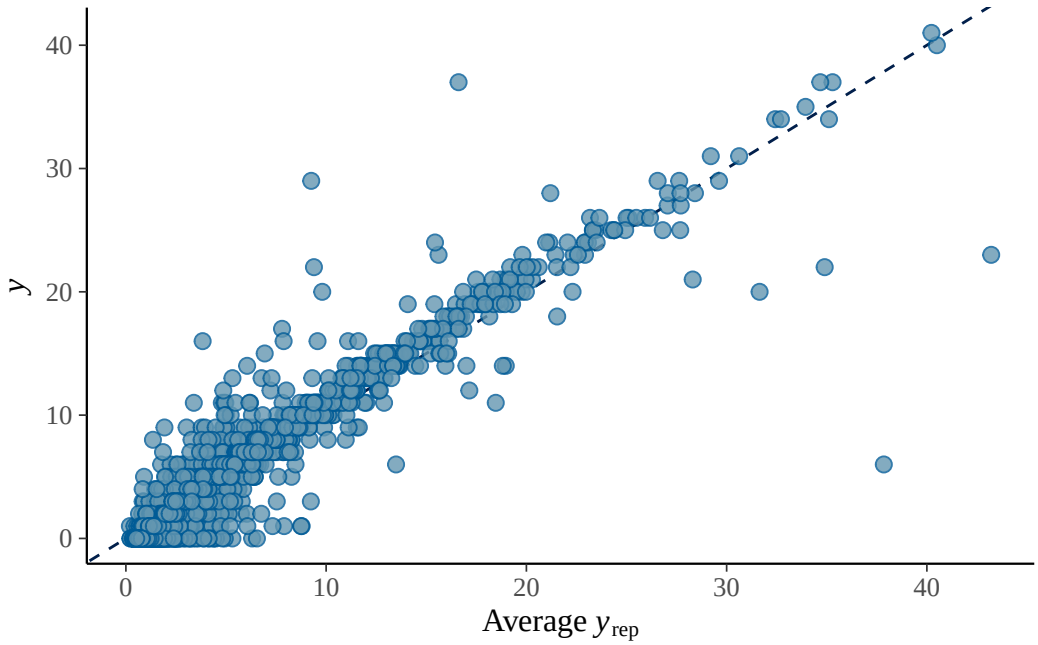



```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```




```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```





Model 3b longitudinal output

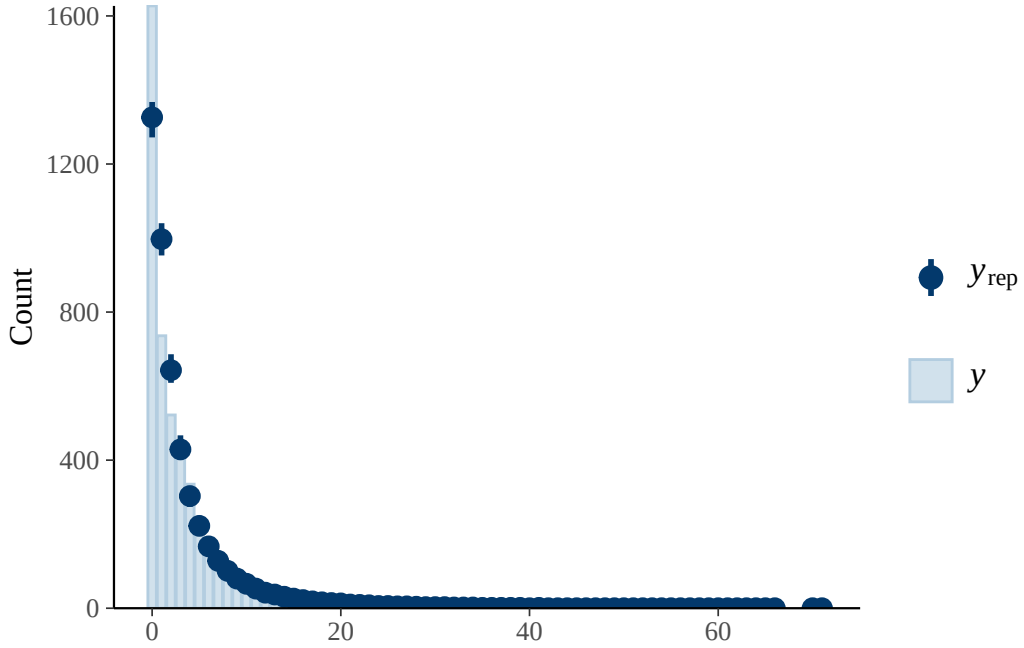
```
   Estimate   Est.Error      Q2.5     Q97.5
R2  0.82776 0.004601313 0.8183071 0.8362862


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_external_r_wave_3 ~ pds_f4_p_c_wave_2 * adhd_diagnosis + age_years_c_wa
   Data: imp_df_wide (Number of observations: 4820)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4177)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.9980    0.0193   0.9598   1.0361 1.0001     1642     2867

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.0857    0.0369   0.0146   0.1626 1.0013      583      912

Regression Coefficients:
```

	Estimate	Est.Error	l-95% CI	u-95% CI	Rhat
Intercept	0.4789	0.0398	0.3993	0.5554	1.0001
pds_f4_p_c_wave_2	0.1630	0.0321	0.1008	0.2270	1.0001
adhd_diagnosis1	0.4710	0.0420	0.3889	0.5530	1.0004
age_years_c_wave_2	-0.0533	0.0267	-0.1058	-0.0009	1.0005
ethnicity2	-0.1216	0.0645	-0.2459	0.0063	1.0008
ethnicity3	-0.0740	0.0562	-0.1863	0.0356	1.0007
ethnicity4	-0.4471	0.1351	-0.7100	-0.1854	1.0000
ethnicity5	0.0135	0.0627	-0.1061	0.1377	0.9999
inr_c_wave_0	-0.0041	0.0065	-0.0171	0.0086	1.0031
cbcl_scr_syn_external_r_c_wave_0	0.0944	0.0032	0.0882	0.1005	1.0020
pds_f4_p_c_wave_2:adhd_diagnosis1	-0.0376	0.0578	-0.1499	0.0764	1.0011

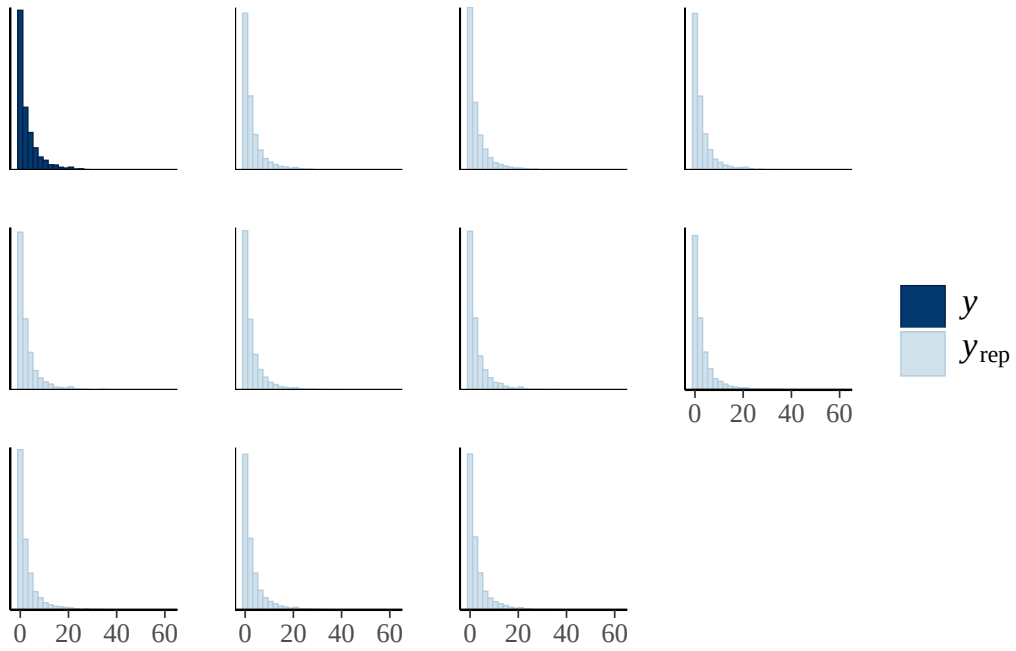
	Bulk_ESS	Tail_ESS
Intercept	1926	3240
pds_f4_p_c_wave_2	2001	3281
adhd_diagnosis1	1886	3577
age_years_c_wave_2	1923	3377
ethnicity2	1329	2364
ethnicity3	1648	3275
ethnicity4	2476	3944
ethnicity5	1333	2584
inr_c_wave_0	1238	2338
cbcl_scr_syn_external_r_c_wave_0	1079	2229
pds_f4_p_c_wave_2:adhd_diagnosis1	1602	3060

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).

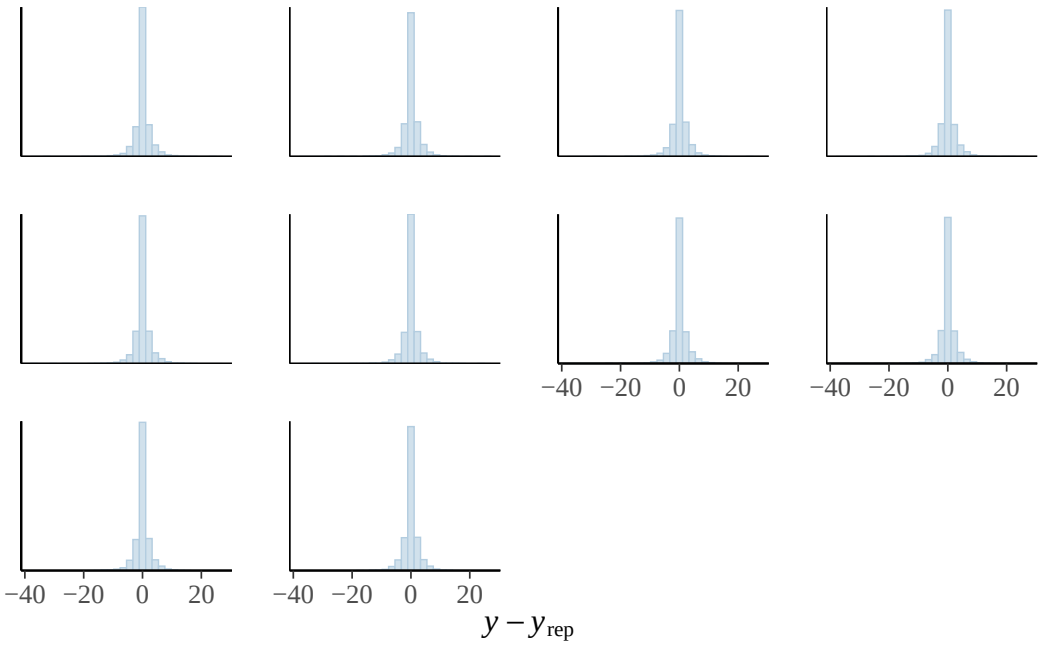
Model 3b long posterior predictive diagnostics



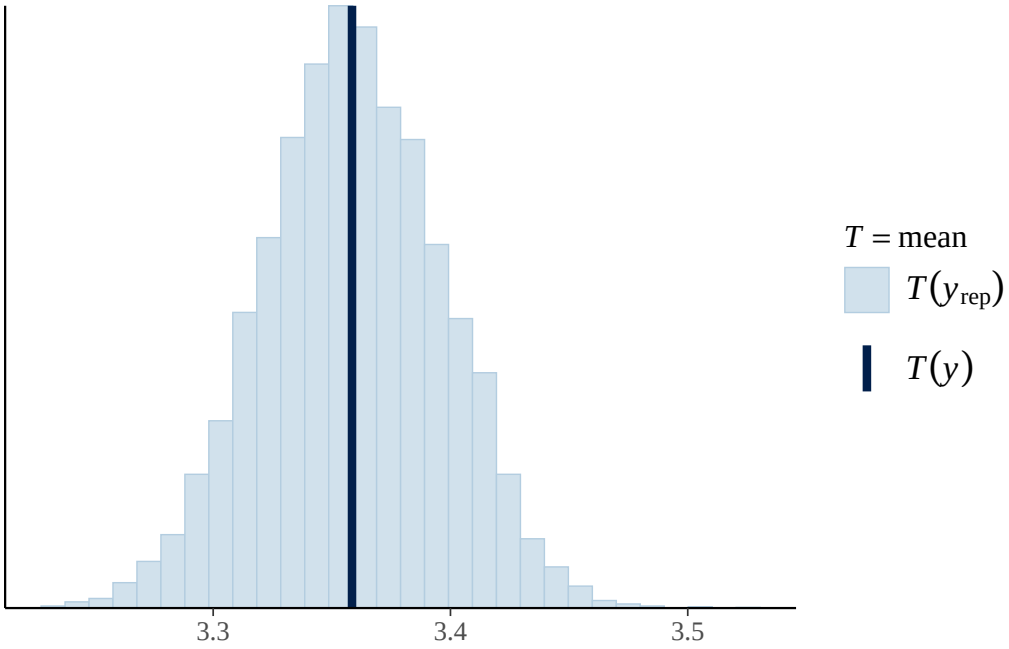

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



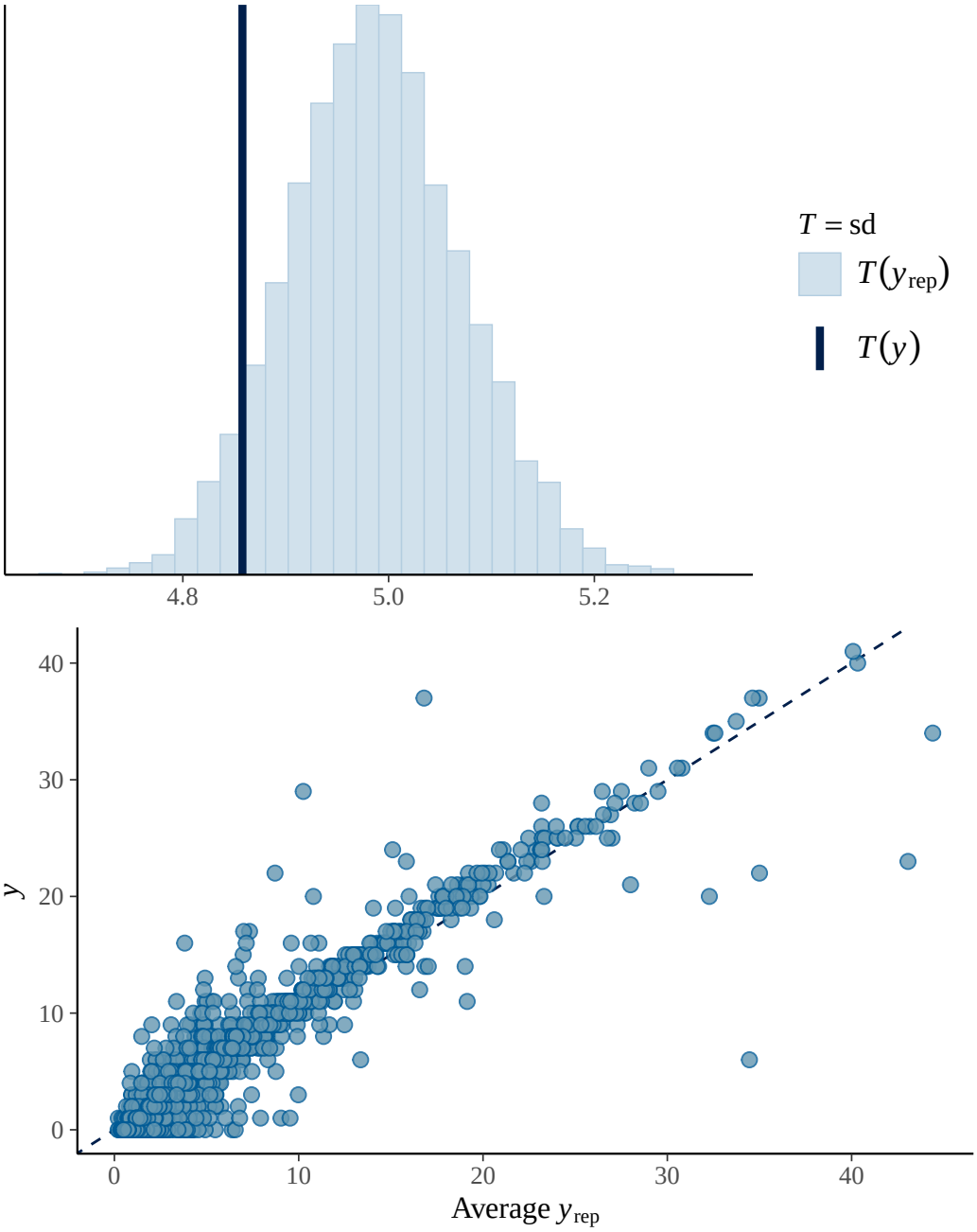
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

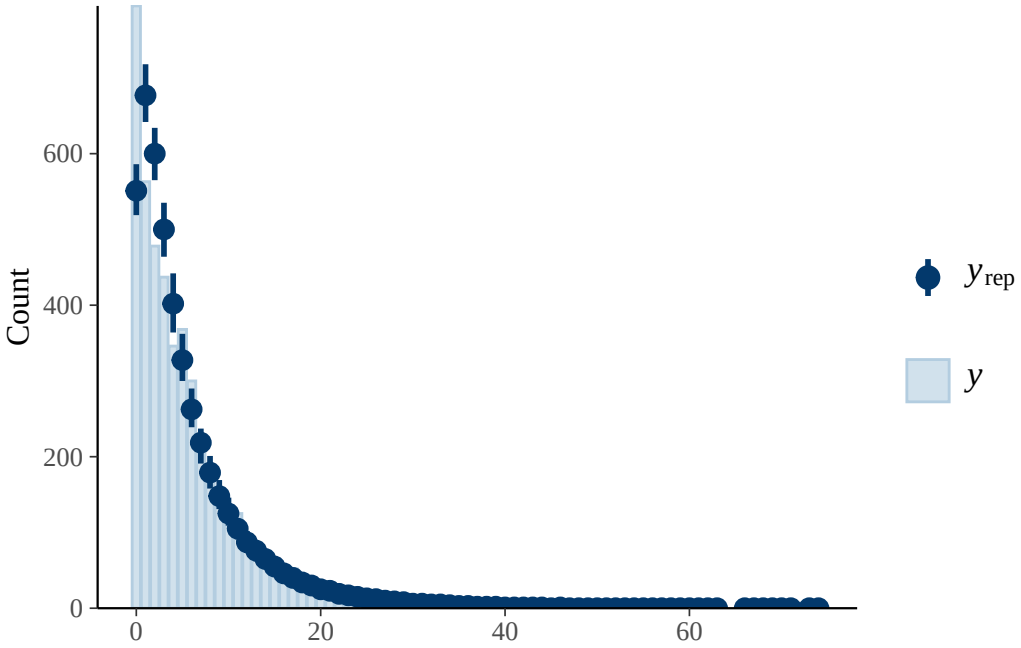


Model 4 longitudinal output

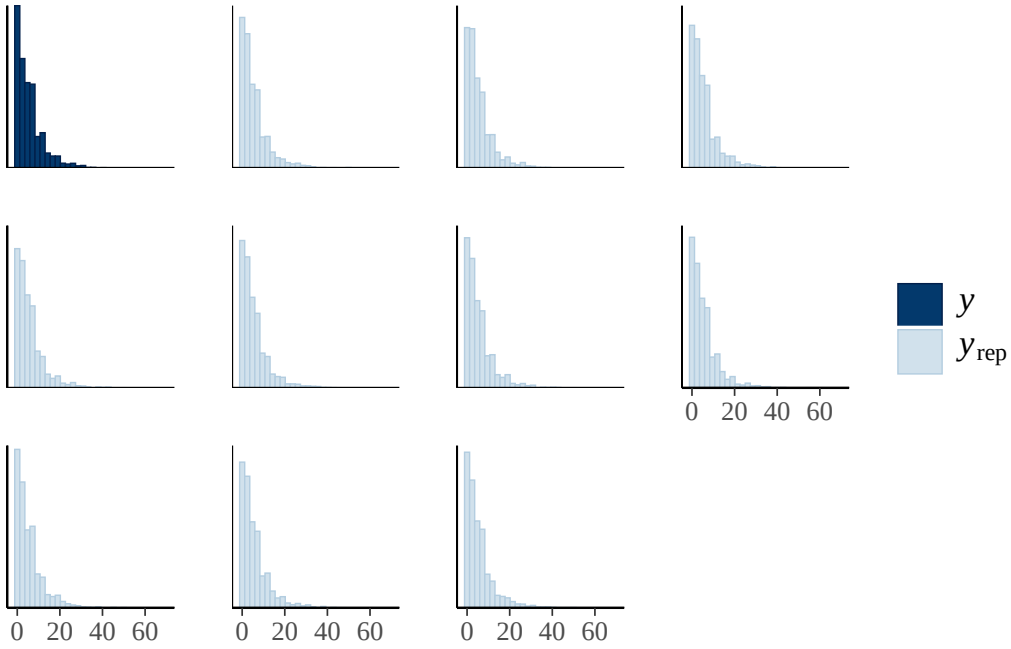
```
    Estimate   Est.Error      Q2.5     Q97.5
R2 0.8369807 0.004239949 0.8285779 0.8450094


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_internal_r_wave_3 ~ menarche_status_p_wave_2 * cbcl_scr_syn_attention_r
   Data: imp_df_wide (Number of observations: 4740)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4111)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.8061    0.0139   0.7797   0.8340 1.0019     1886     3311

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.1079    0.0289   0.0586   0.1718 1.0013     1194     1780

Regression Coefficients:
                                                          Estimate Est.Error
Intercept                                                   1.3102    0.0364
menarche_status_p_wave_2Y                                   0.1812    0.0290
cbcl_scr_syn_attention_r_c_wave_2                           0.0723    0.0055
age_years_c_wave_2                                          0.0001    0.0211
ethnicity2                                                 -0.4182    0.0521
ethnicity3                                                 -0.0681    0.0452
ethnicity4                                                 -0.3464    0.1042
ethnicity5                                                  0.0715    0.0484
inr_c_wave_0                                                0.0167    0.0051
cbcl_scr_syn_internal_r_c_wave_0                            0.0704    0.0024
menarche_status_p_wave_2Y:cbcl_scr_syn_attention_r_c_wave_2  0.0001    0.0081
                                                          l-95% CI u-95% CI
Intercept                                                   1.2386   1.3809
menarche_status_p_wave_2Y                                   0.1257   0.2394
cbcl_scr_syn_attention_r_c_wave_2                           0.0616   0.0833
age_years_c_wave_2                                         -0.0413   0.0425
ethnicity2                                                 -0.5230  -0.3181
ethnicity3                                                 -0.1576   0.0196
ethnicity4                                                 -0.5523  -0.1439
```

```
ethnicity5                                                 -0.0235   0.1660
inr_c_wave_0                                                0.0069   0.0266
cbcl_scr_syn_internal_r_c_wave_0                            0.0657   0.0751
menarche_status_p_wave_2Y:cbcl_scr_syn_attention_r_c_wave_2 -0.0158   0.0161
                                                            Rhat Bulk_ESS
Intercept                                                 1.0005     2645
menarche_status_p_wave_2Y                                 1.0002     2579
cbcl_scr_syn_attention_r_c_wave_2                         1.0011     2135
age_years_c_wave_2                                        1.0021     2407
ethnicity2                                                0.9999     2122
ethnicity3                                                1.0004     2007
ethnicity4                                                1.0003     2880
ethnicity5                                                1.0010     1878
inr_c_wave_0                                              0.9998     2080
cbcl_scr_syn_internal_r_c_wave_0                          1.0009     1852
menarche_status_p_wave_2Y:cbcl_scr_syn_attention_r_c_wave_2 1.0008     1952
                                                          Tail_ESS
Intercept                                                     4008
menarche_status_p_wave_2Y                                     4138
cbcl_scr_syn_attention_r_c_wave_2                             3637
age_years_c_wave_2                                            4008
ethnicity2                                                    3463
ethnicity3                                                    3757
ethnicity4                                                    4724
ethnicity5                                                    2883
inr_c_wave_0                                                  3577
cbcl_scr_syn_internal_r_c_wave_0                              3100
menarche_status_p_wave_2Y:cbcl_scr_syn_attention_r_c_wave_2   3594

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).
```

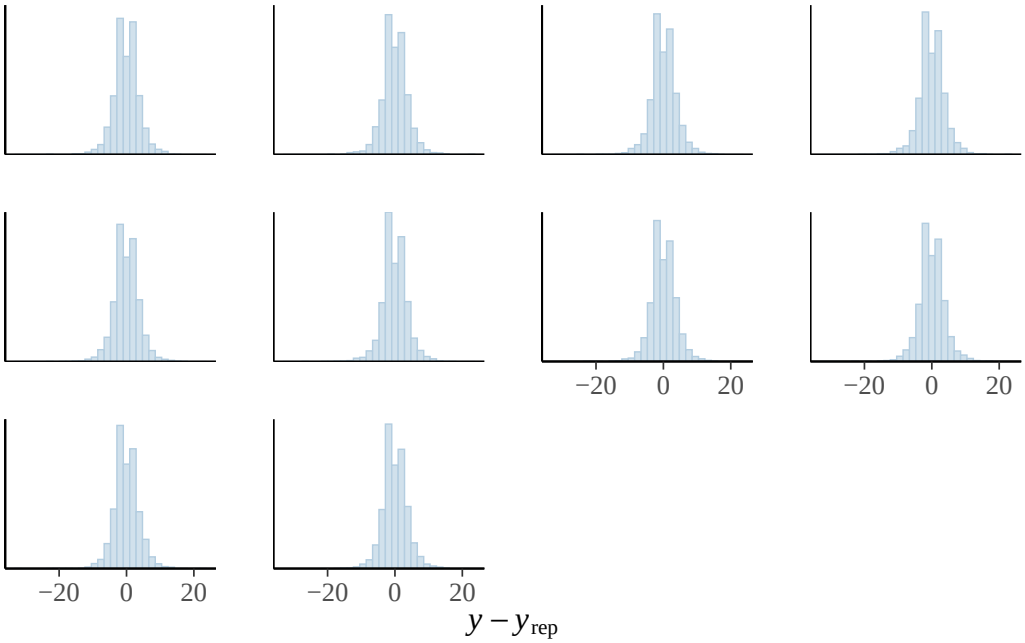
Model 4 long posterior predictive diagnostics



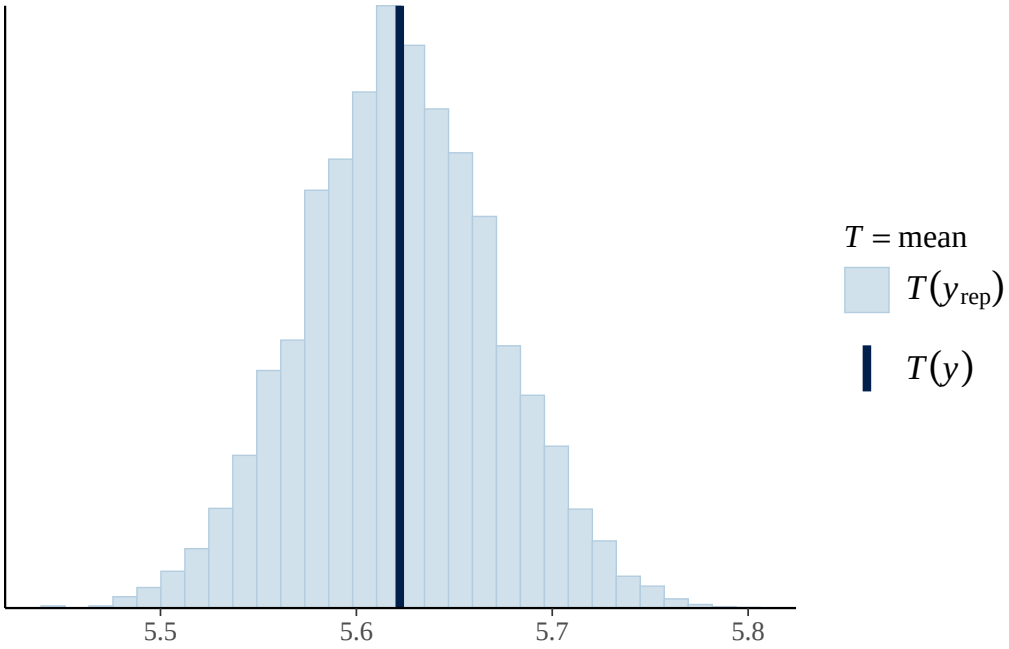

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



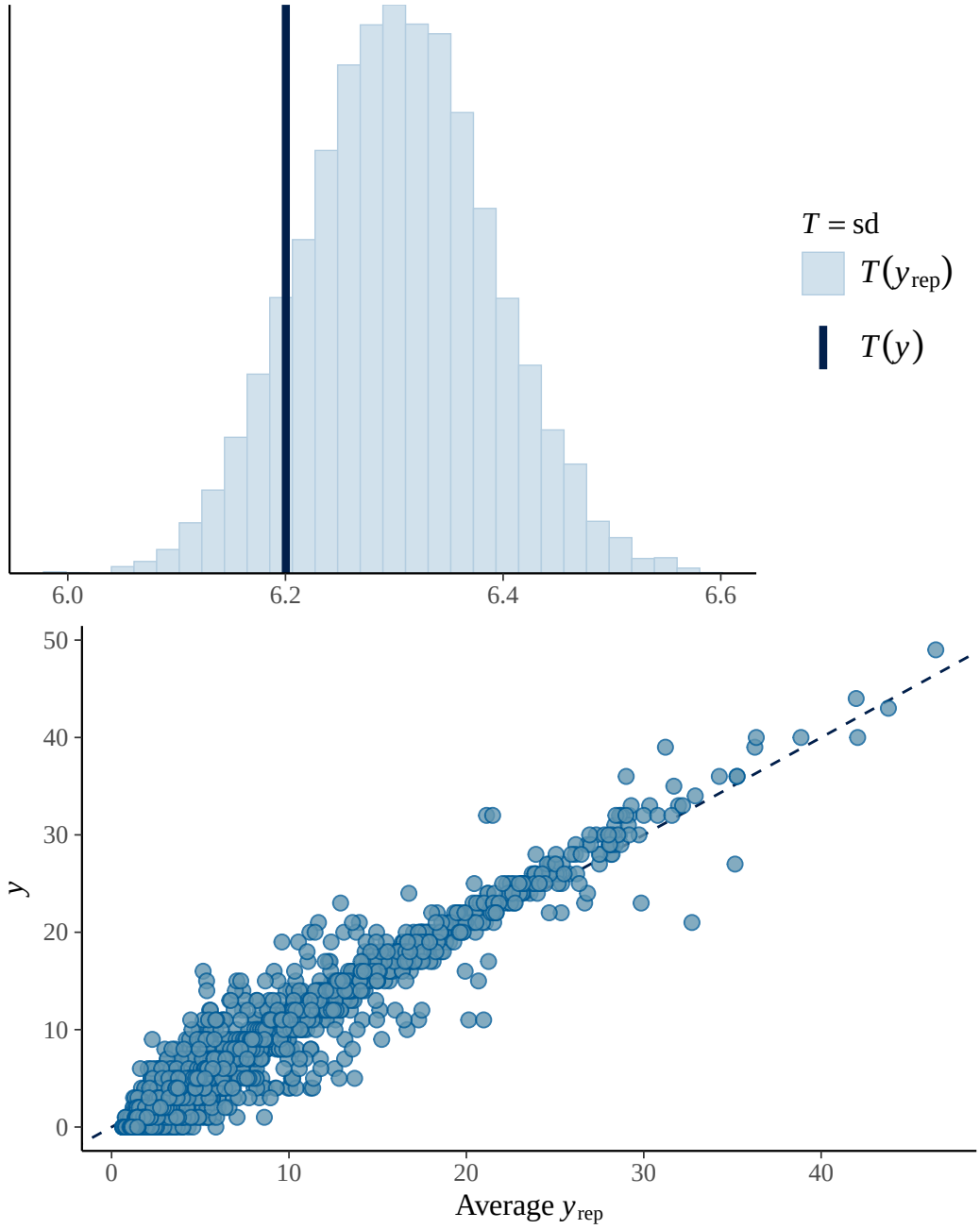
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

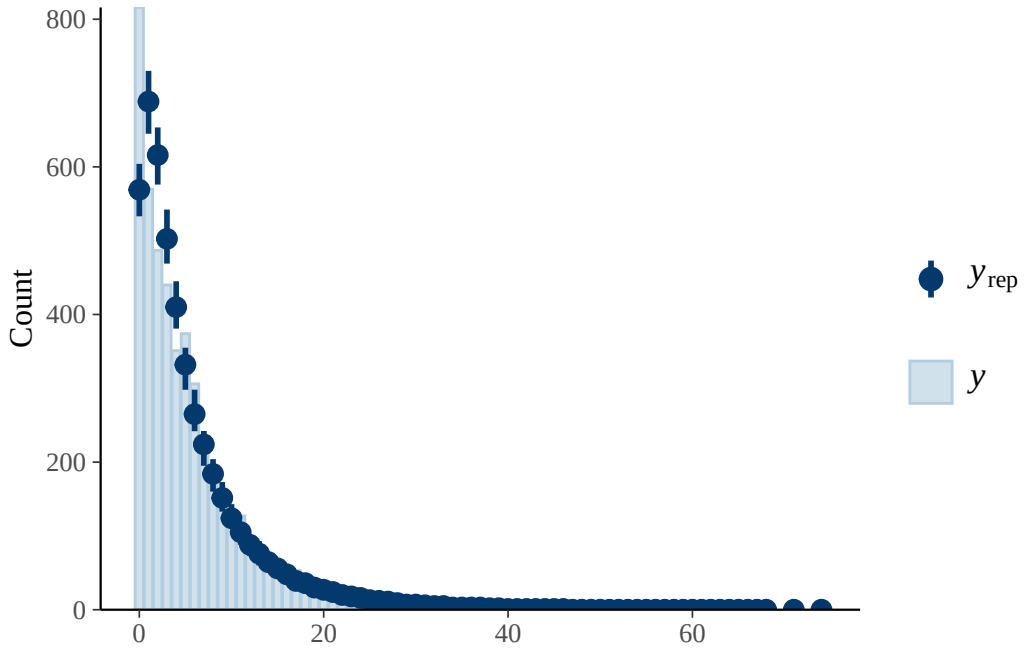


Model 4b longitudinal output

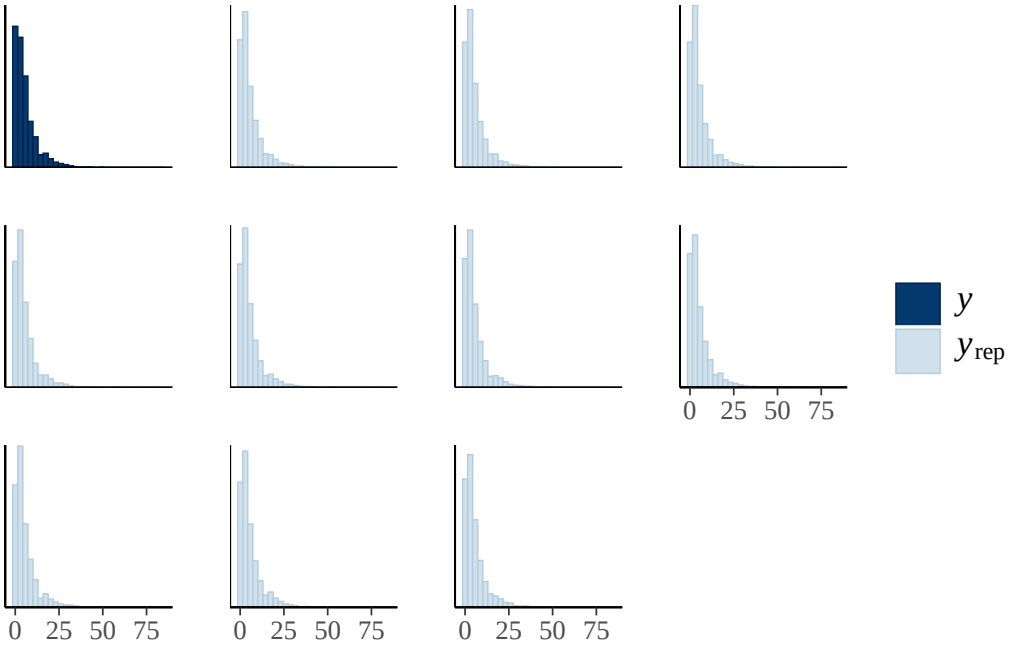
```
    Estimate   Est.Error     Q2.5    Q97.5
R2 0.8370656 0.004096887 0.828786 0.844775


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_internal_r_wave_3 ~ pds_f4_p_c_wave_2 * cbcl_scr_syn_attention_r_c_wave
   Data: imp_df_wide (Number of observations: 4820)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4177)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.8119    0.0140   0.7845   0.8400 1.0008     1747     3642

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.1087    0.0289   0.0578   0.1706 1.0007     1191     1875

Regression Coefficients:
                                                  Estimate Est.Error l-95% CI
Intercept                                           1.3339    0.0356   1.2636
pds_f4_p_c_wave_2                                   0.1232    0.0218   0.0809
cbcl_scr_syn_attention_r_c_wave_2                   0.0658    0.0046   0.0569
age_years_c_wave_2                                  0.0222    0.0210  -0.0179
ethnicity2                                         -0.3987    0.0512  -0.4978
ethnicity3                                         -0.0532    0.0451  -0.1418
ethnicity4                                         -0.3458    0.1053  -0.5513
ethnicity5                                          0.0561    0.0478  -0.0376
inr_c_wave_0                                        0.0150    0.0049   0.0054
cbcl_scr_syn_internal_r_c_wave_0                    0.0709    0.0024   0.0662
pds_f4_p_c_wave_2:cbcl_scr_syn_attention_r_c_wave_2 0.0104    0.0063  -0.0021
                                                  u-95% CI   Rhat Bulk_ESS
Intercept                                           1.4038 1.0001     2425
pds_f4_p_c_wave_2                                   0.1662 1.0002     2474
cbcl_scr_syn_attention_r_c_wave_2                   0.0747 1.0000     2113
age_years_c_wave_2                                  0.0645 1.0008     2348
ethnicity2                                         -0.2993 1.0010     1707
ethnicity3                                          0.0347 1.0026     1742
ethnicity4                                         -0.1409 1.0002     2756
```

```
ethnicity5                                                0.1507 1.0011     1809
inr_c_wave_0                                              0.0245 0.9999     2112
cbcl_scr_syn_internal_r_c_wave_0                          0.0755 1.0046     1396
pds_f4_p_c_wave_2:cbcl_scr_syn_attention_r_c_wave_2       0.0224 1.0006     2204
                                                        Tail_ESS
Intercept                                                   3664
pds_f4_p_c_wave_2                                           4236
cbcl_scr_syn_attention_r_c_wave_2                           3655
age_years_c_wave_2                                          4099
ethnicity2                                                  3464
ethnicity3                                                  3250
ethnicity4                                                  4881
ethnicity5                                                  3255
inr_c_wave_0                                                3824
cbcl_scr_syn_internal_r_c_wave_0                            2928
pds_f4_p_c_wave_2:cbcl_scr_syn_attention_r_c_wave_2         3888

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).
```

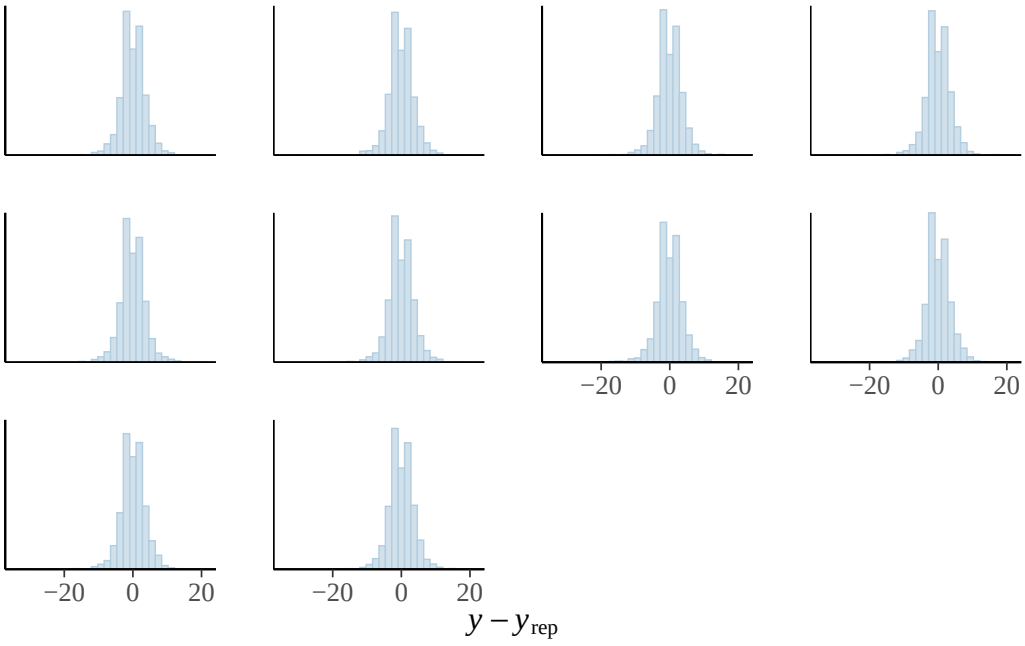
Model 4b long posterior predictive diagnostics



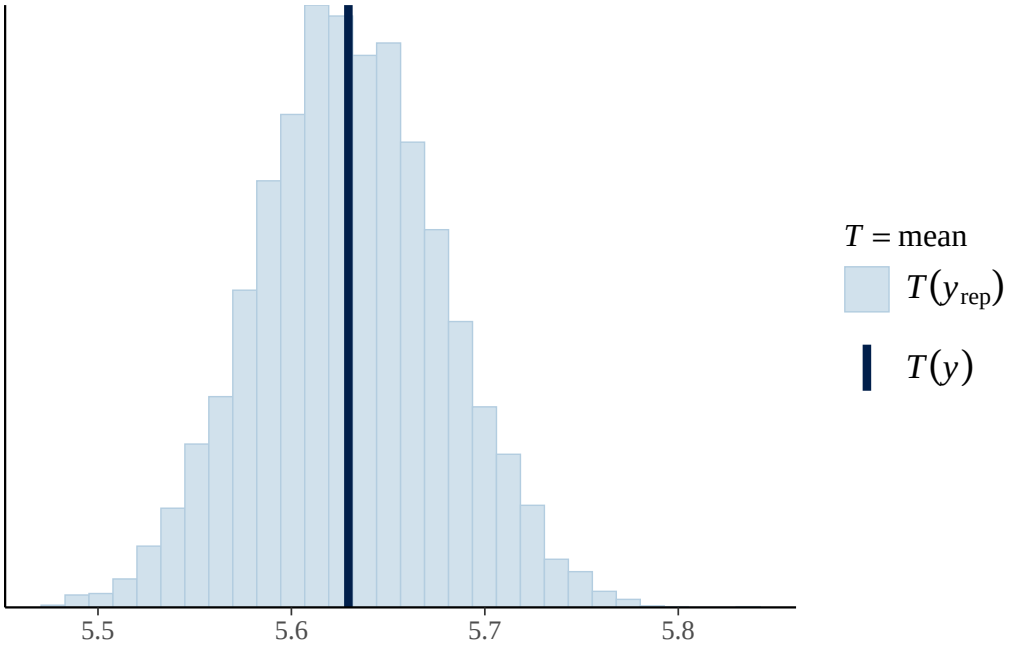
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



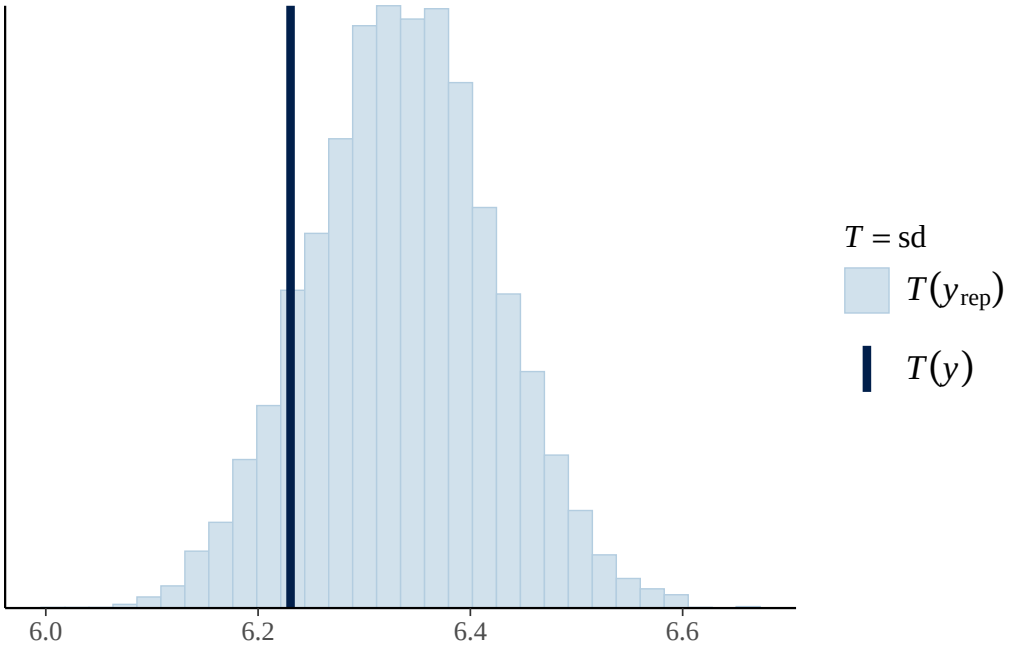
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.

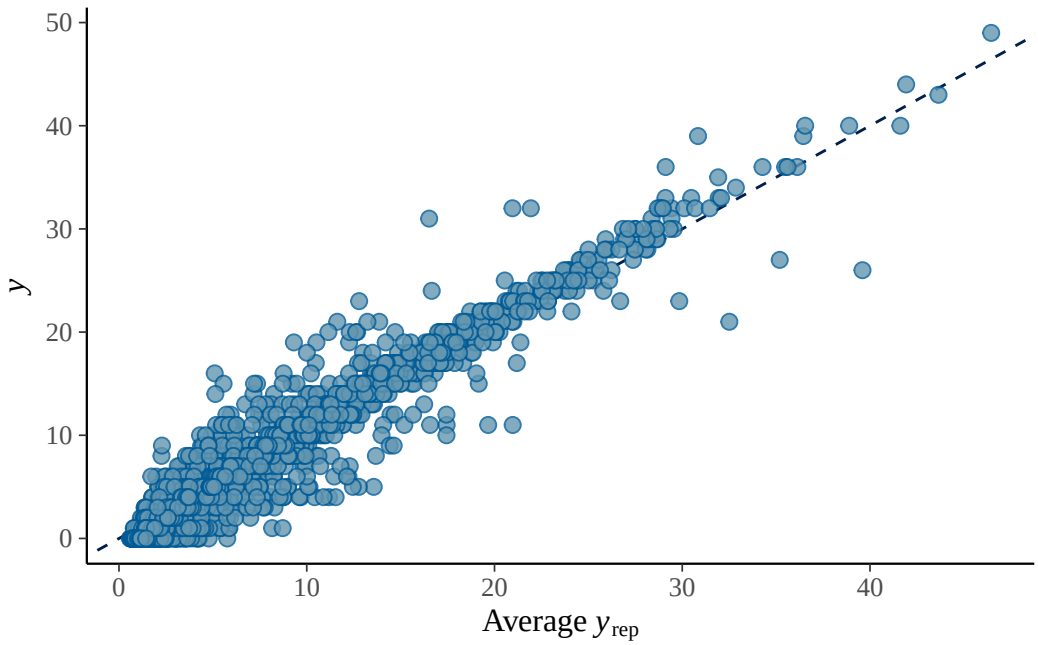


```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```




```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```





Model 5 longitudinal output

```
    Estimate   Est.Error      Q2.5     Q97.5
R2 0.8274319 0.004740652 0.8179656 0.8363873


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_external_r_wave_3 ~ menarche_status_p_wave_2 * cbcl_scr_syn_attention_r
   Data: imp_df_wide (Number of observations: 4740)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4111)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.9512    0.0183   0.9152   0.9866 1.0030     1511     3596

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.0904    0.0373   0.0129   0.1660 1.0022      524      498

Regression Coefficients:
```

	Estimate	Est.Error
Intercept	0.5749	0.0395
menarche_status_p_wave_2Y	0.1276	0.0379
cbcl_scr_syn_attention_r_c_wave_2	0.0976	0.0067
age_years_c_wave_2	-0.0625	0.0267
ethnicity2	-0.1290	0.0634
ethnicity3	-0.0758	0.0548
ethnicity4	-0.3935	0.1376
ethnicity5	0.0052	0.0622
inr_c_wave_0	-0.0000	0.0064
cbcl_scr_syn_external_r_c_wave_0	0.0880	0.0031
menarche_status_p_wave_2Y:cbcl_scr_syn_attention_r_c_wave_2	0.0123	0.0097

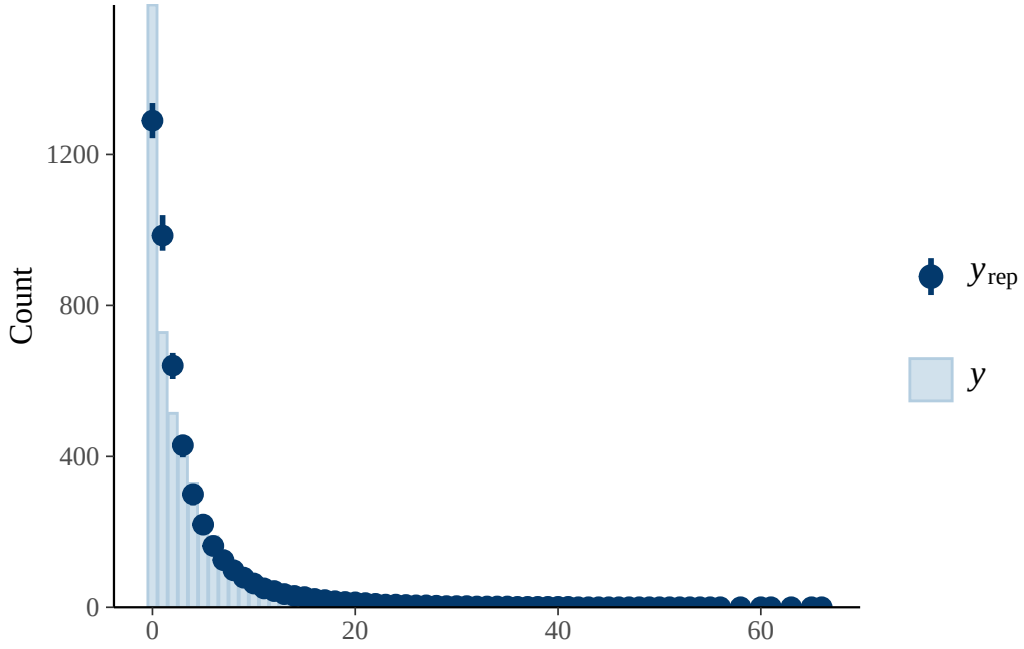
	l-95% CI	u-95% CI
Intercept	0.4956	0.6525
menarche_status_p_wave_2Y	0.0531	0.2024
cbcl_scr_syn_attention_r_c_wave_2	0.0845	0.1108
age_years_c_wave_2	-0.1161	-0.0108
ethnicity2	-0.2546	-0.0037
ethnicity3	-0.1805	0.0338
ethnicity4	-0.6658	-0.1234
ethnicity5	-0.1147	0.1275
inr_c_wave_0	-0.0126	0.0122
cbcl_scr_syn_external_r_c_wave_0	0.0819	0.0942
menarche_status_p_wave_2Y:cbcl_scr_syn_attention_r_c_wave_2	-0.0066	0.0312

	Rhat	Bulk_ESS
Intercept	1.0008	1954
menarche_status_p_wave_2Y	1.0019	1652
cbcl_scr_syn_attention_r_c_wave_2	1.0027	1070
age_years_c_wave_2	1.0017	1664
ethnicity2	1.0009	1368
ethnicity3	1.0006	1246
ethnicity4	1.0000	2665
ethnicity5	1.0029	1257
inr_c_wave_0	1.0014	1345
cbcl_scr_syn_external_r_c_wave_0	1.0056	1194
menarche_status_p_wave_2Y:cbcl_scr_syn_attention_r_c_wave_2	1.0040	1077

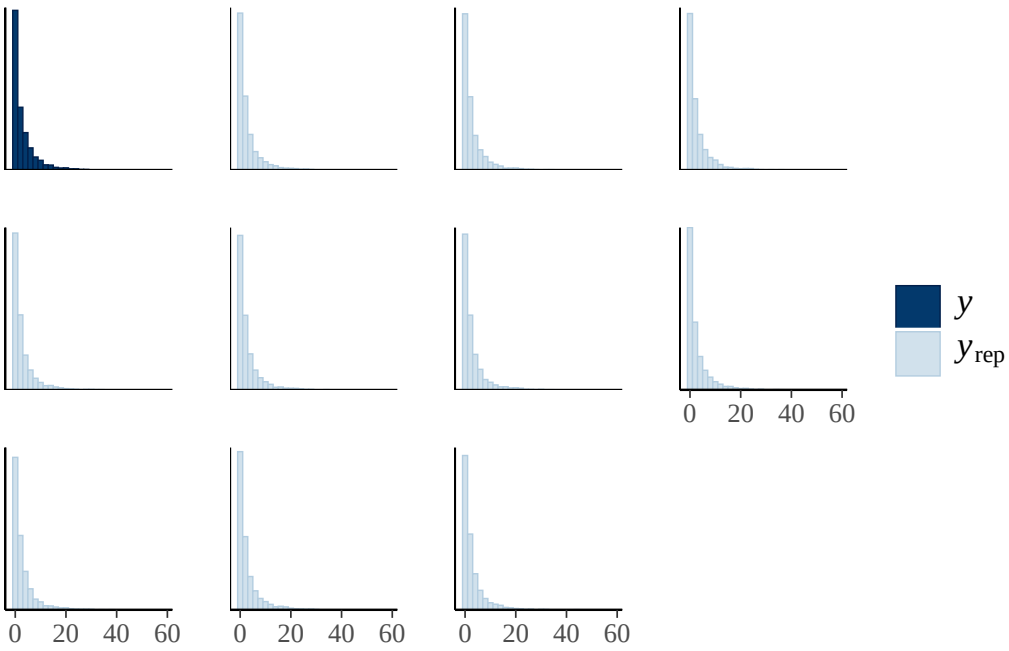
	Tail_ESS
Intercept	3738
menarche_status_p_wave_2Y	3166
cbcl_scr_syn_attention_r_c_wave_2	2883
age_years_c_wave_2	3160
ethnicity2	2376
ethnicity3	2507

```
ethnicity4                                                    4289
ethnicity5                                                    2285
inr_c_wave_0                                                  2749
cbcl_scr_syn_external_r_c_wave_0                              2081
menarche_status_p_wave_2Y:cbcl_scr_syn_attention_r_c_wave_2   2692

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).
```

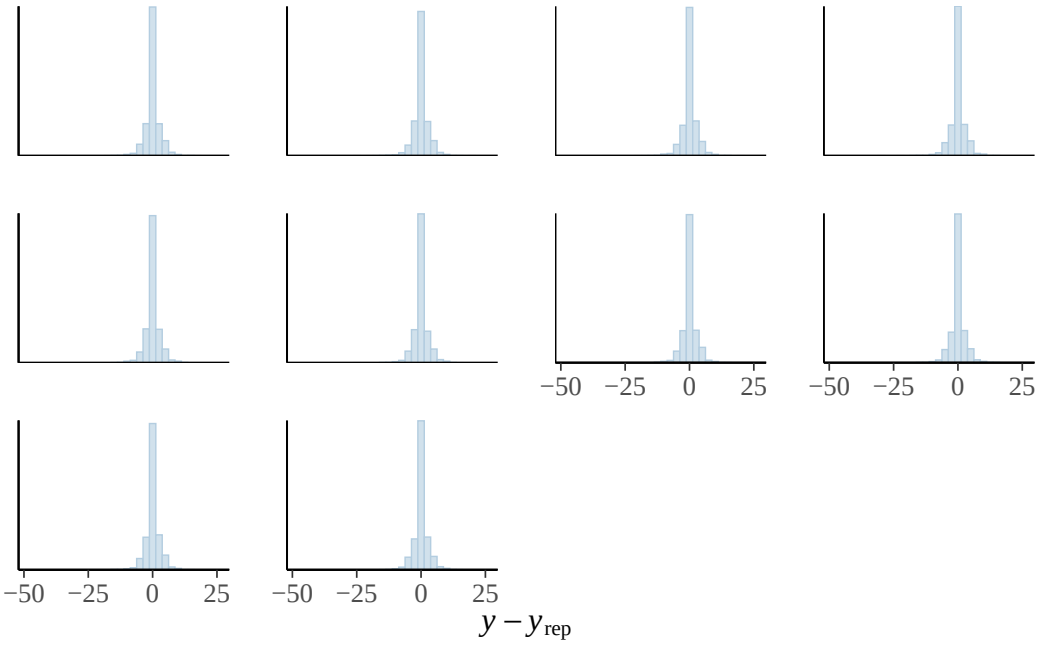
Model 5 long posterior predictive diagnostics



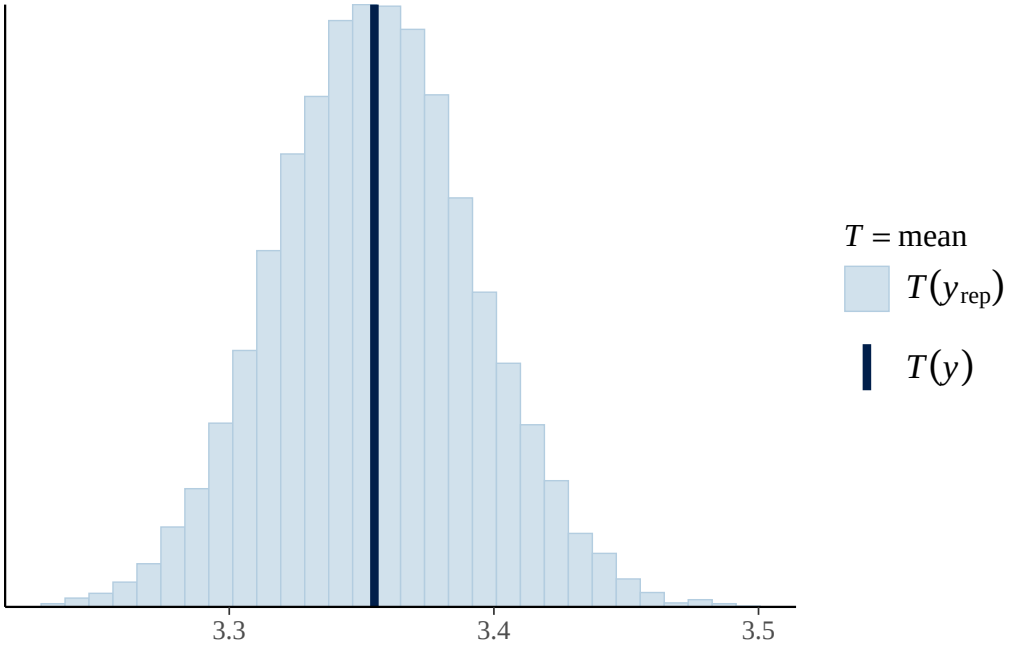

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



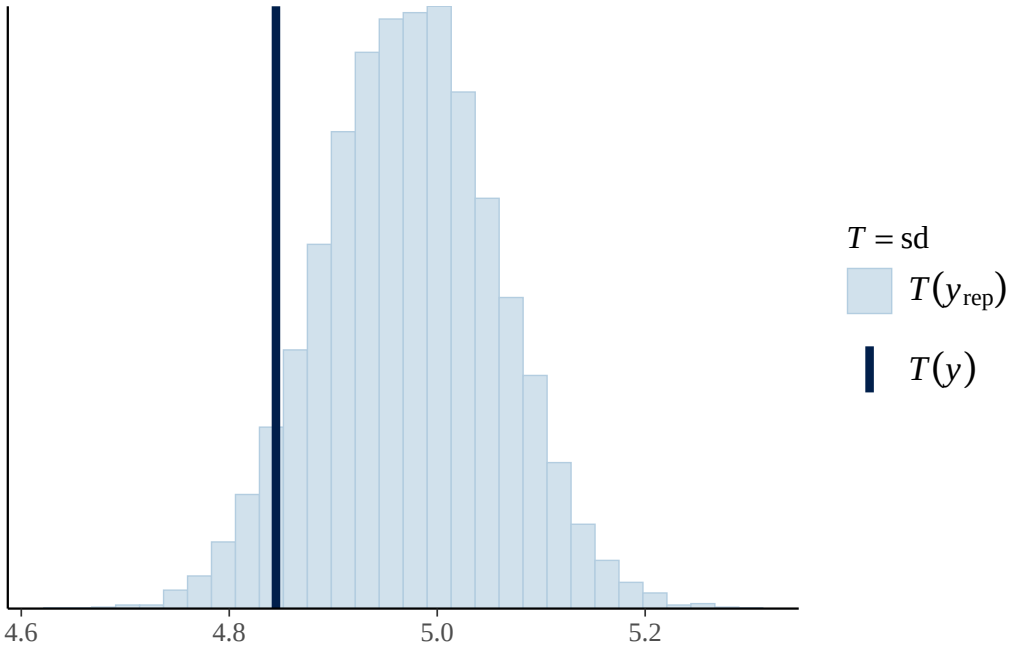

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

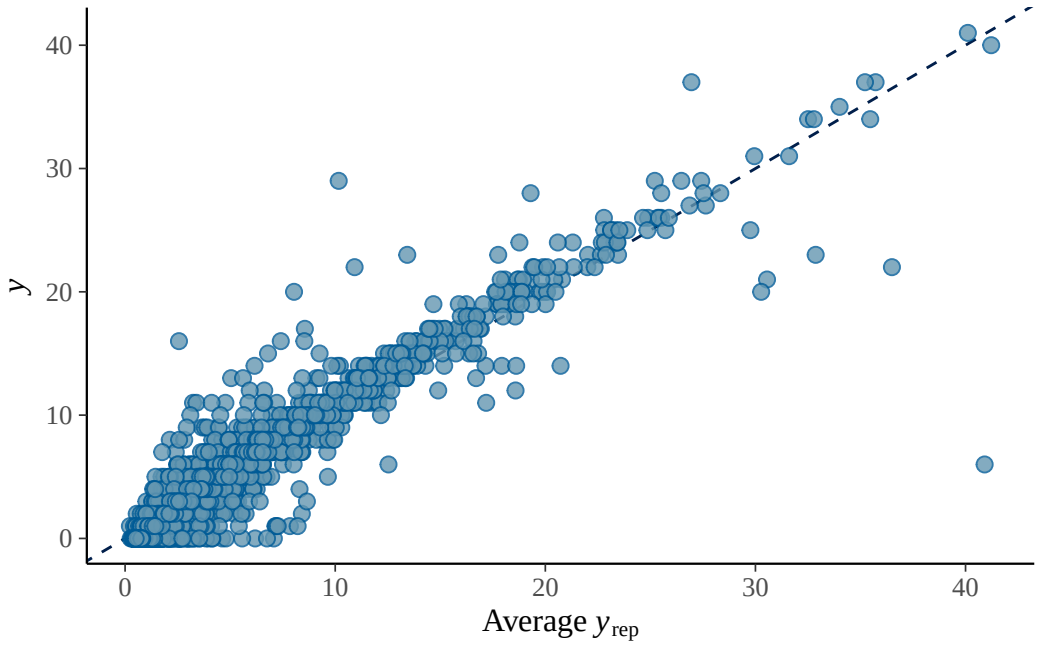



```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```




```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



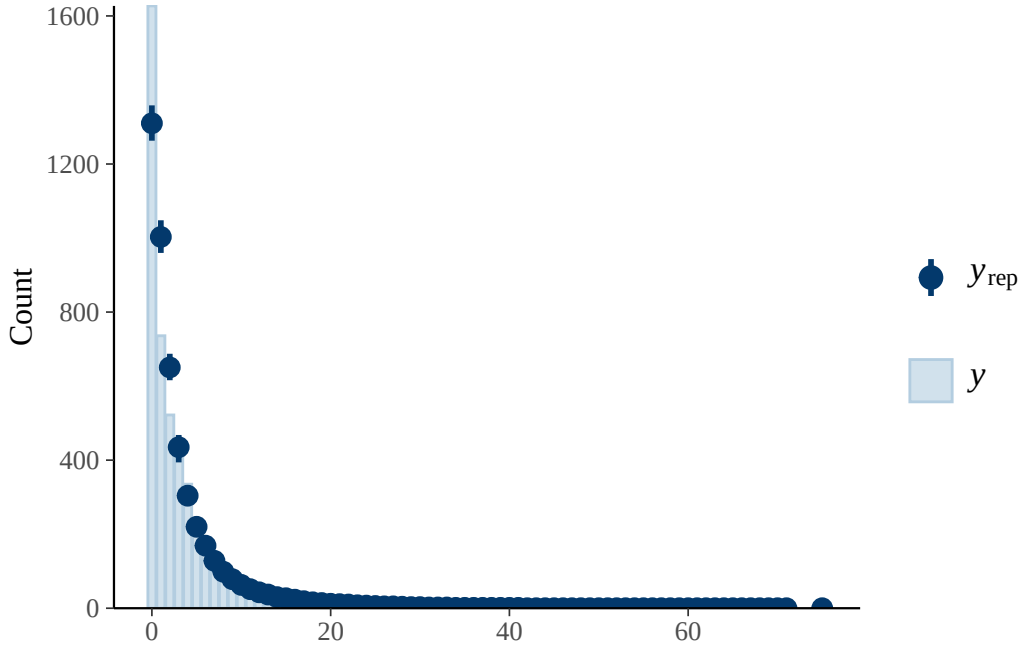


Model 5b longitudinal output

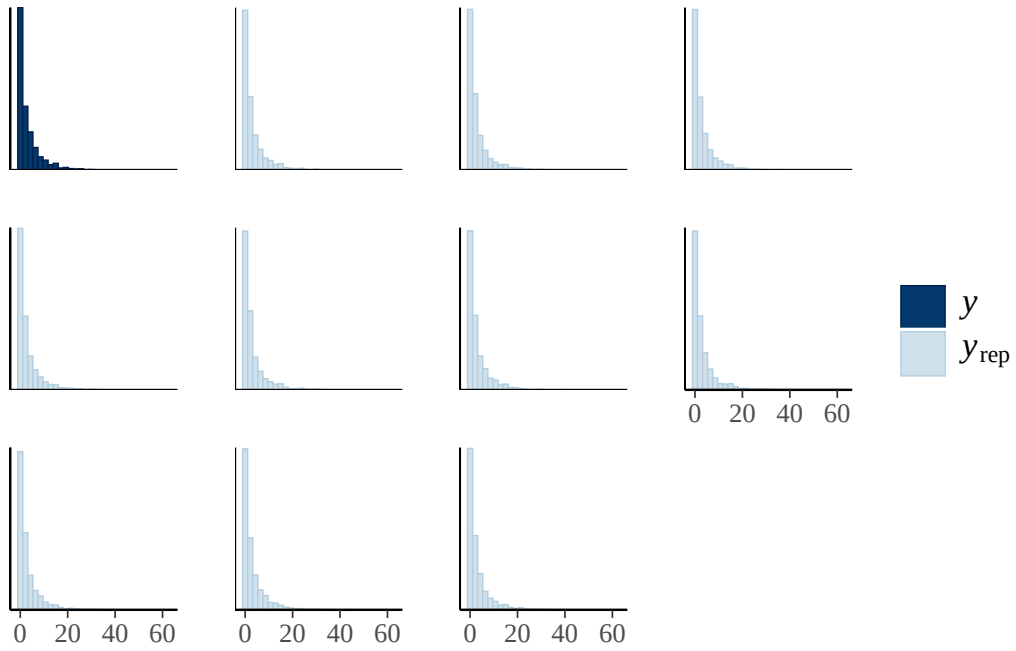
```
    Estimate   Est.Error      Q2.5     Q97.5
R2 0.8294749 0.004649183 0.8201655 0.8384089


 Family: poisson
  Links: mu = log
Formula: cbcl_scr_syn_external_r_wave_3 ~ pds_f4_p_c_wave_2 * cbcl_scr_syn_attention_r_c_wave
   Data: imp_df_wide (Number of observations: 4820)
  Draws: 2 chains, each with iter = 8000; warmup = 4000; thin = 1;
         total post-warmup draws = 8000

Multilevel Hyperparameters:
~family_id (Number of levels: 4177)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.9539    0.0181   0.9188   0.9891 1.0013     1527     2720

~site_id (Number of levels: 22)
              Estimate Est.Error l-95% CI u-95% CI   Rhat Bulk_ESS Tail_ESS
sd(Intercept)   0.0868    0.0375   0.0126   0.1646 1.0017      555      751

Regression Coefficients:
```

```
                                                    Estimate Est.Error l-95% CI
Intercept                                             0.5961    0.0382   0.5183
pds_f4_p_c_wave_2                                     0.1509    0.0281   0.0962
cbcl_scr_syn_attention_r_c_wave_2                     0.0967    0.0057   0.0854
age_years_c_wave_2                                   -0.0635    0.0256  -0.1148
ethnicity2                                           -0.1391    0.0621  -0.2620
ethnicity3                                           -0.0776    0.0554  -0.1872
ethnicity4                                           -0.4133    0.1329  -0.6782
ethnicity5                                           -0.0235    0.0603  -0.1439
inr_c_wave_0                                         -0.0026    0.0063  -0.0148
cbcl_scr_syn_external_r_c_wave_0                      0.0856    0.0031   0.0794
pds_f4_p_c_wave_2:cbcl_scr_syn_attention_r_c_wave_2   0.0150    0.0076  -0.0001
                                                    u-95% CI   Rhat Bulk_ESS
Intercept                                             0.6690 1.0008     2001
pds_f4_p_c_wave_2                                     0.2057 1.0005     2157
cbcl_scr_syn_attention_r_c_wave_2                     0.1081 1.0023     1779
age_years_c_wave_2                                   -0.0124 1.0004     2245
ethnicity2                                           -0.0171 1.0024     1260
ethnicity3                                            0.0288 1.0042     1127
ethnicity4                                           -0.1562 1.0002     2662
ethnicity5                                            0.0954 1.0010     1452
inr_c_wave_0                                          0.0097 1.0004     1542
cbcl_scr_syn_external_r_c_wave_0                      0.0918 1.0039     1206
pds_f4_p_c_wave_2:cbcl_scr_syn_attention_r_c_wave_2   0.0300 1.0016     1240
                                                    Tail_ESS
Intercept                                               3550
pds_f4_p_c_wave_2                                       3471
cbcl_scr_syn_attention_r_c_wave_2                       3351
age_years_c_wave_2                                      4013
ethnicity2                                              2640
ethnicity3                                              3235
ethnicity4                                              3687
ethnicity5                                              2870
inr_c_wave_0                                            3338
cbcl_scr_syn_external_r_c_wave_0                        2675
pds_f4_p_c_wave_2:cbcl_scr_syn_attention_r_c_wave_2     2902

Draws were sampled using sampling(NUTS). For each parameter, Bulk_ESS
and Tail_ESS are effective sample size measures, and Rhat is the potential
scale reduction factor on split chains (at convergence, Rhat = 1).
```

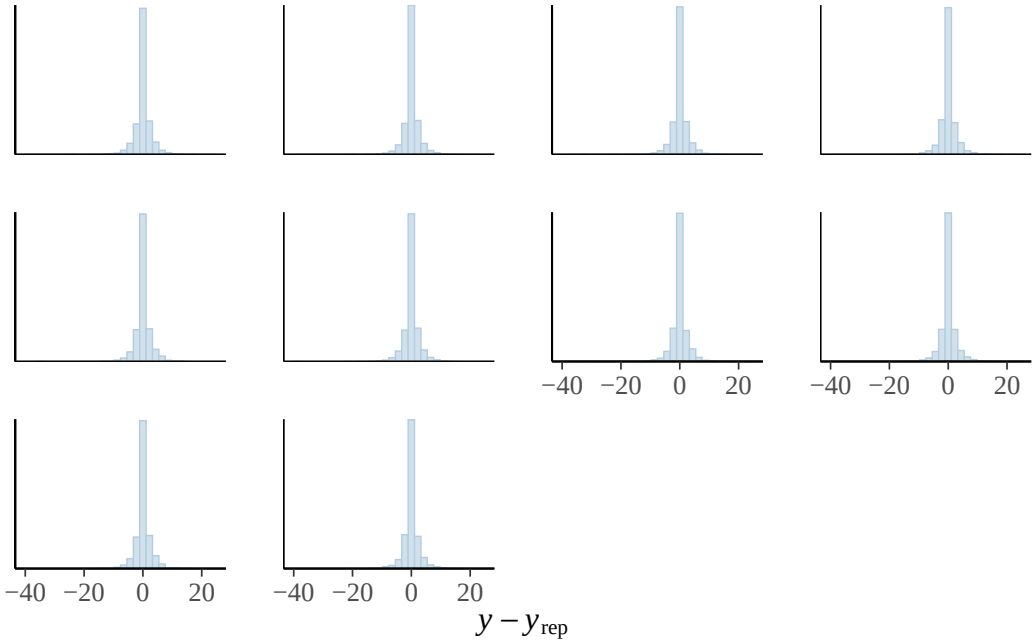
Model 5b long posterior predictive diagnostics



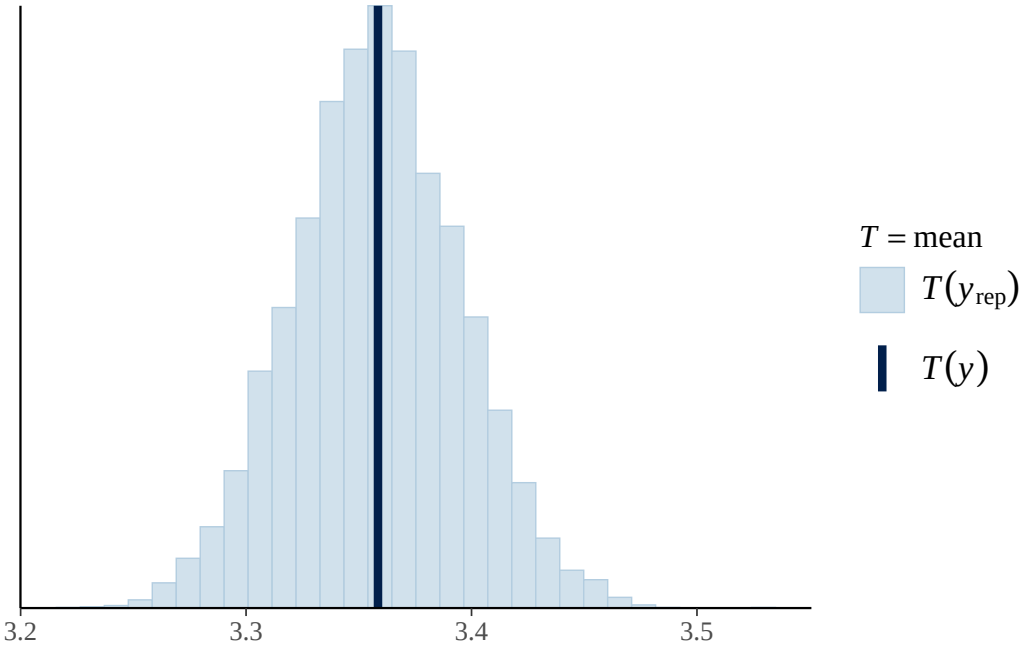

```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```



`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.



```
`stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```