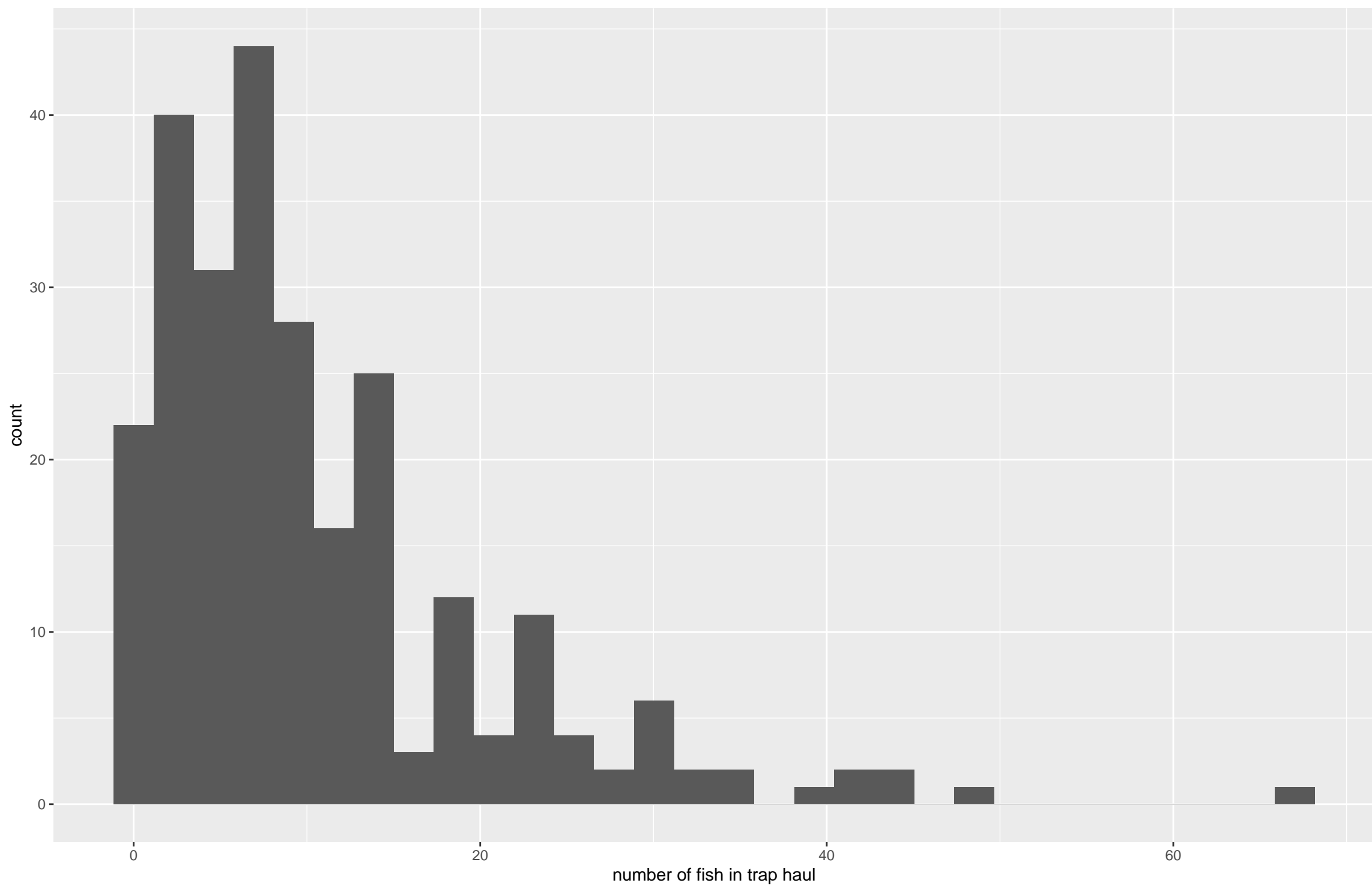
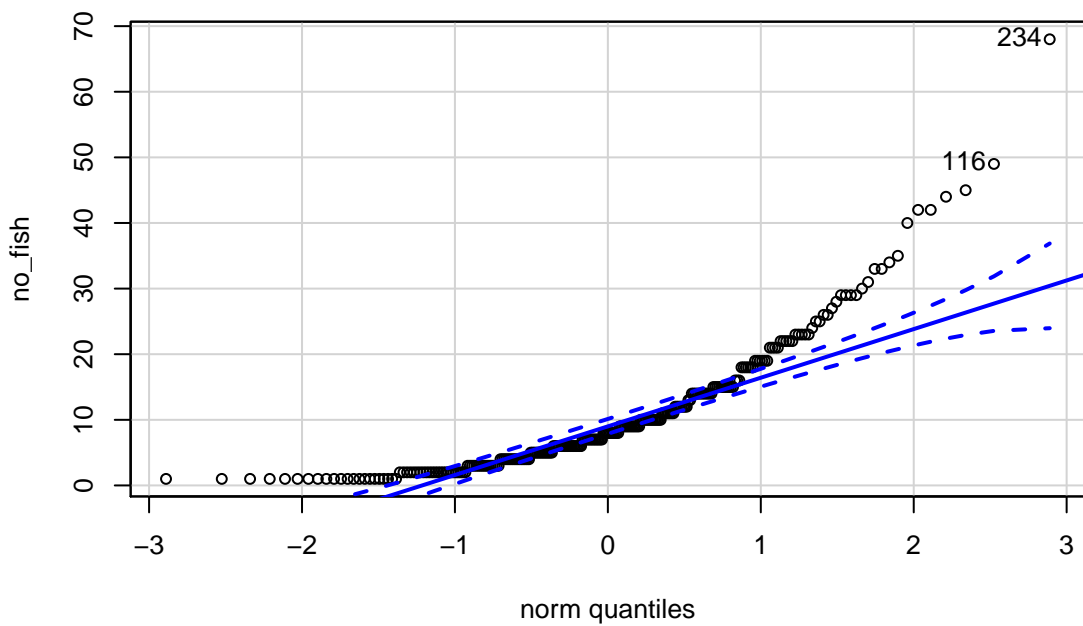


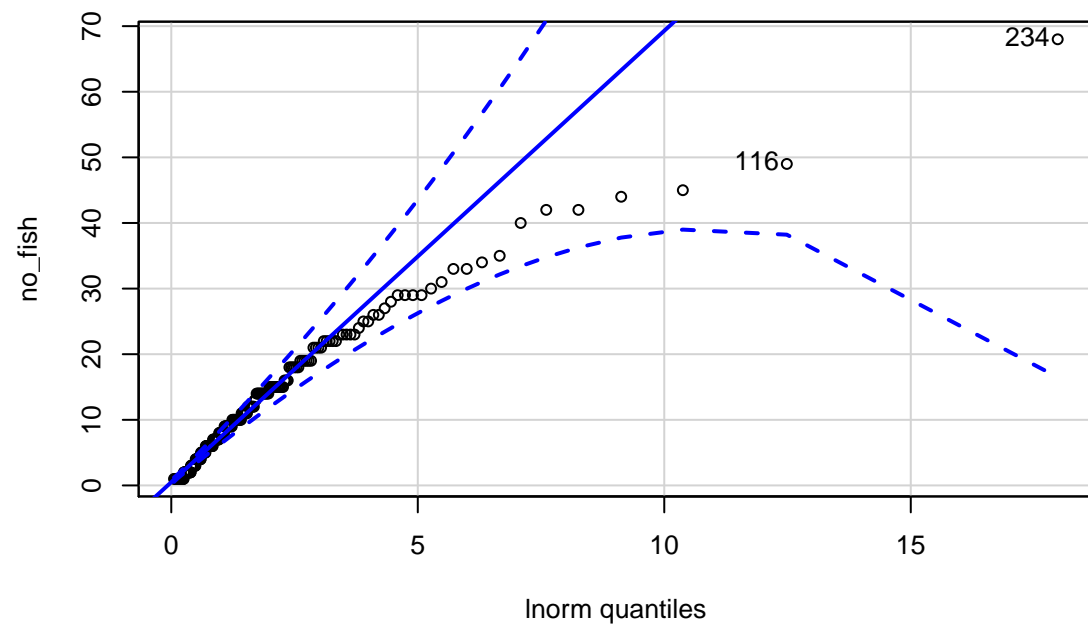
Histogram of number of fish



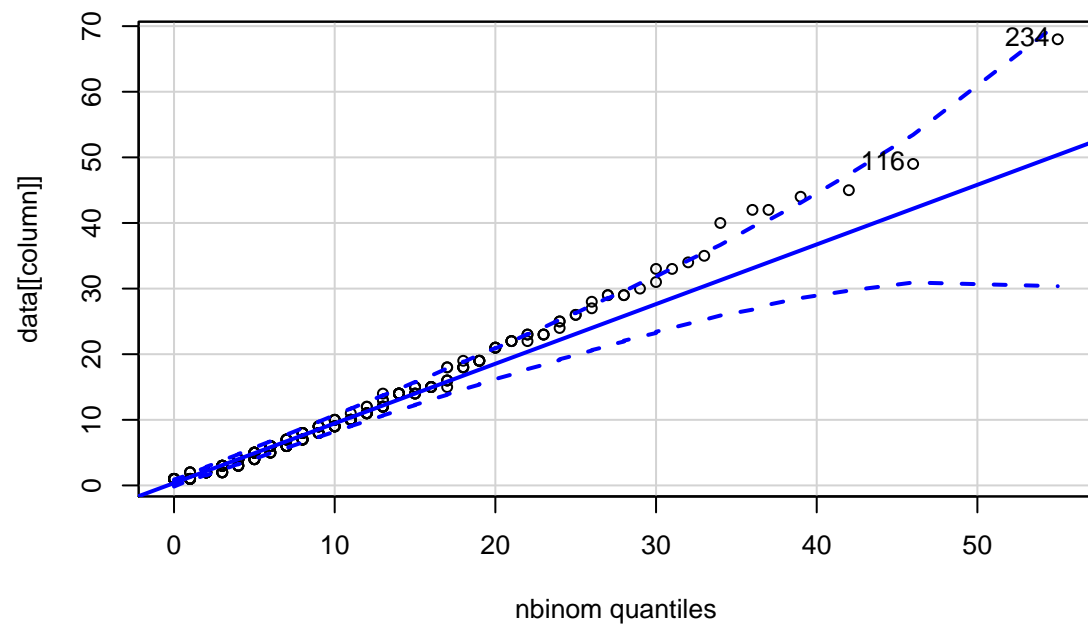
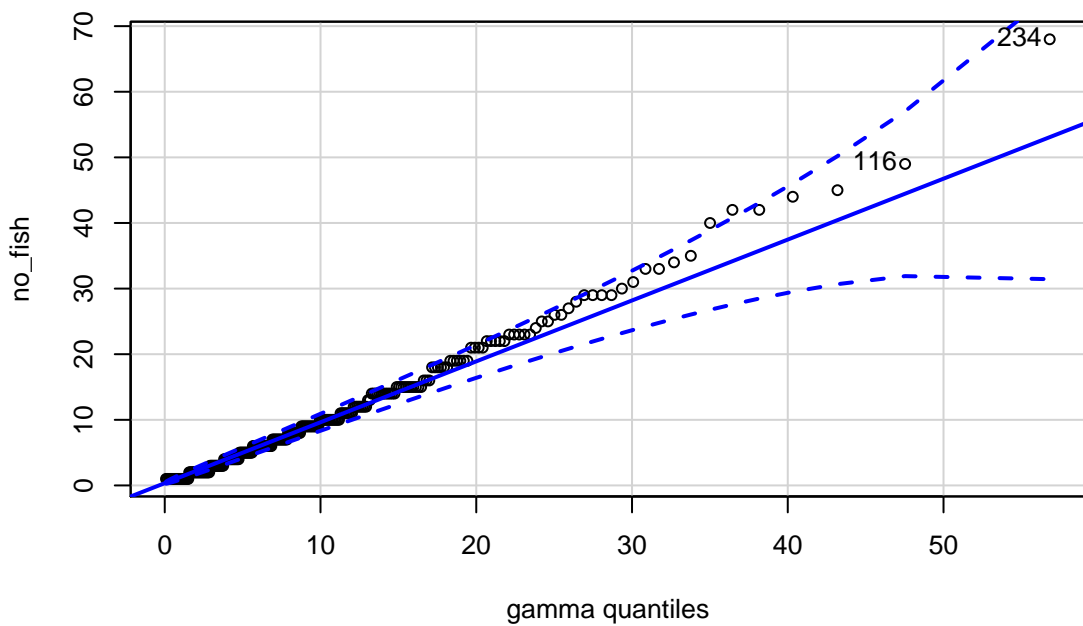
Normal distribution

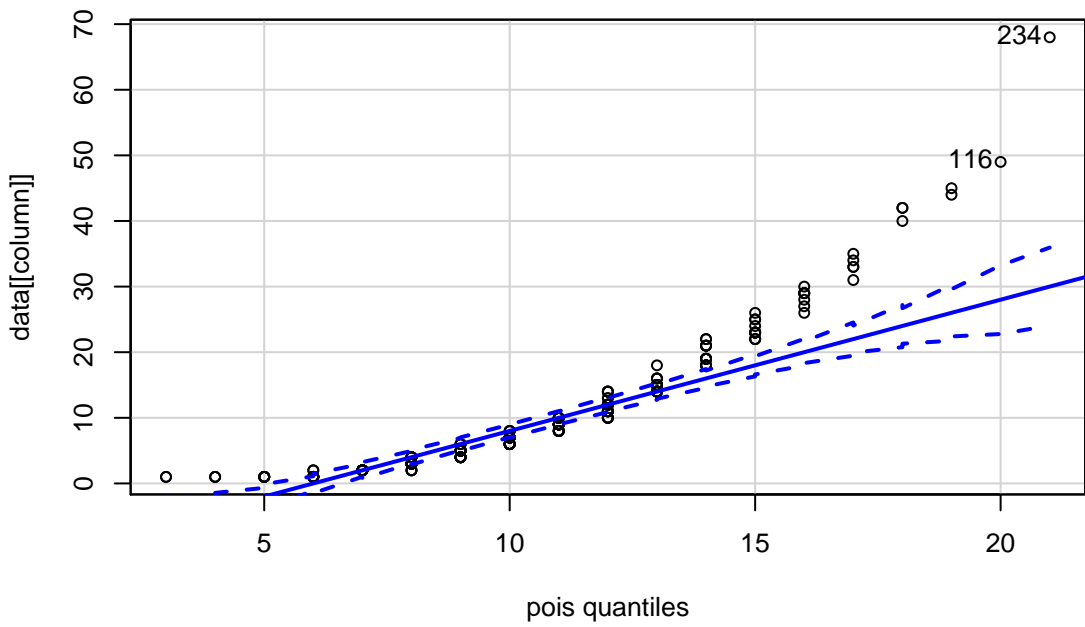


Log-normal distribution



Gamma distribution





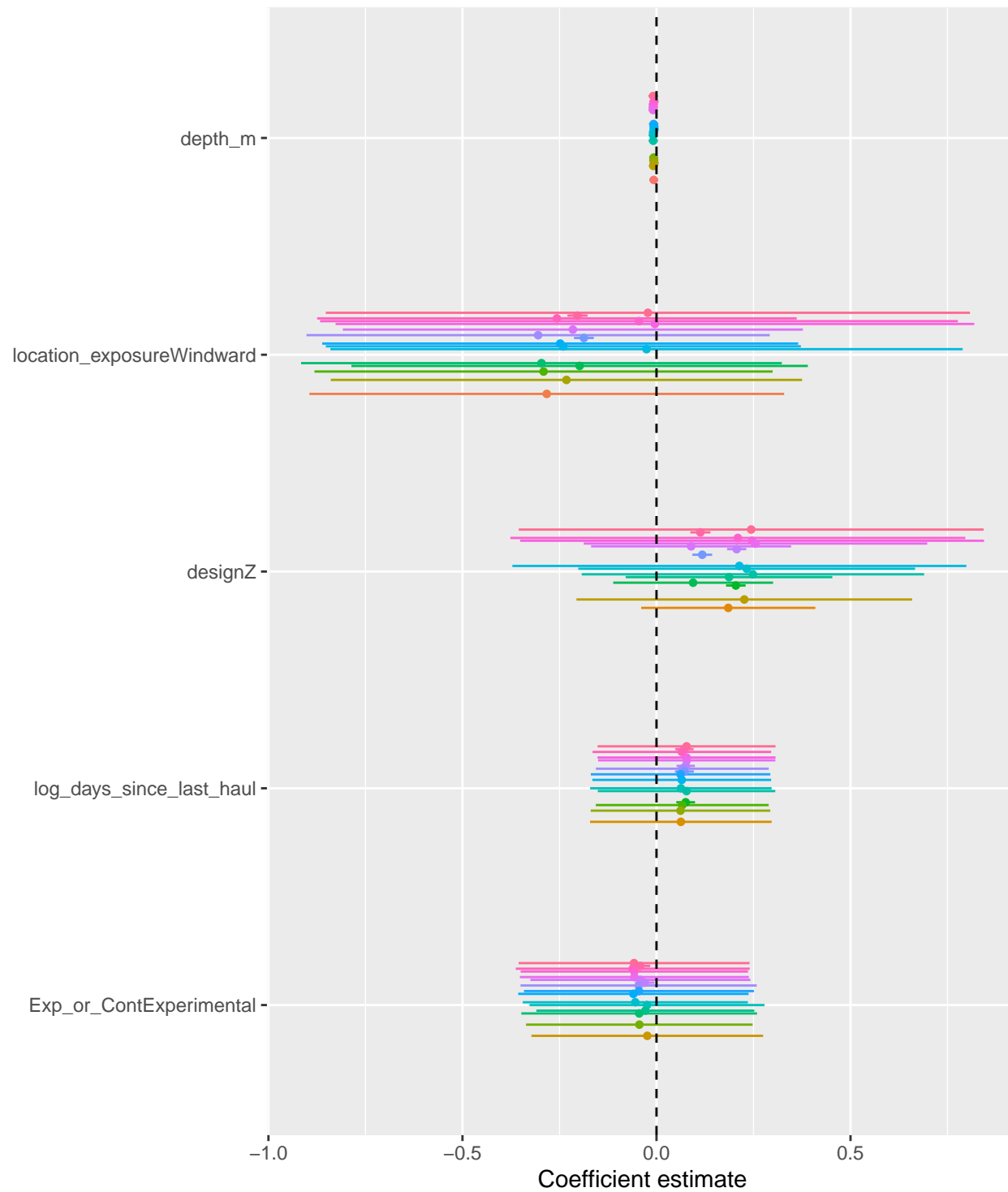
```
Global model call: glmer(formula = no_fish ~ design + log_days_since_last_haul +
  location_exposure + Exp_or_Cont + depth_m + (1 | TrapID) +
  (1 | Date_YMD), data = trap_haul_no_zero_depth, family = MASS::negative.binomial(theta = 1.84982325122415),
  control = glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000)),
  na.action = "na.fail")
```

Model selection table

	(Int)	dpt_m	dsg	Exp_or_Cnt	lct_exp	log_dys_snc_lst_hal	df	logLik
1	2.280						4	-867.612
2	2.530	-0.006953					5	-867.092
9	2.298				+		5	-867.209
3	2.121		+				5	-867.278
17	2.138					0.06275	5	-867.473
5	2.292			+			5	-867.600
4	2.374	-0.008051	+				6	-866.586
10	2.516	-0.006166			+		6	-866.818
18	2.393	-0.007049				0.06188	6	-866.953
6	2.563	-0.007236		+			6	-867.048
25	2.149				+	0.06631	6	-867.052
19	1.935		+			0.07519	6	-867.077
11	2.212		+		+		6	-867.158
13	2.322			+	+		6	-867.167
7	2.134		+	+			6	-867.259
20	2.189	-0.008303	+			0.07739	7	-866.364
21	2.150			+		0.06282	6	-867.460
8	2.411	-0.008444	+	+			7	-866.517
12	2.381	-0.007899	+		+		7	-866.584
26	2.372	-0.006234			+	0.06501	7	-866.663
14	2.561	-0.006499		+	+		7	-866.739
22	2.427	-0.007340		+		0.06198	7	-866.908
27	2.029		+		+	0.07191	7	-866.974
29	2.174			+	+	0.06658	7	-867.009
23	1.948		+	+		0.07531	7	-867.057
15	2.239		+	+	+		7	-867.122
24	2.227	-0.008715	+	+		0.07793	8	-866.291
28	2.191	-0.008277	+		+	0.07732	8	-866.364
16	2.427	-0.008204	+	+	+		8	-866.512
30	2.417	-0.006576		+	+	0.06538	8	-866.582
31	2.056		+	+	+	0.07197	8	-866.938
32	2.235	-0.008586	+	+	+	0.07752	9	-866.290
AICc delta weight								
1	1743.4	0.00	0.146					
2	1744.4	1.04	0.087					
9	1744.7	1.27	0.077					

model	sigma	logLik	AIC	BIC	deviance	df.residual
none	1.00	-867.61	1743.22	1757.45	252.56	255.00
depth_m	1.00	-867.09	1744.18	1761.97	254.53	254.00
location_exposure	1.00	-867.21	1744.42	1762.20	251.95	254.00
design	1.00	-867.28	1744.56	1762.34	252.80	254.00
log_days_since_last_haul	1.00	-867.47	1744.95	1762.73	251.74	254.00
Exp_or_Cont	1.00	-867.60	1745.20	1762.98	252.48	254.00
depth_m + design	1.00	-866.59	1745.17	1766.51	255.18	253.00
depth_m + location_exposure	1.00	-866.82	1745.64	1766.98	253.91	253.00
depth_m + log_days_since_last_haul	1.00	-866.95	1745.91	1767.25	253.67	253.00
depth_m + Exp_or_Cont	1.00	-867.05	1746.10	1767.44	254.41	253.00
location_exposure + log_days_since_last_haul	1.00	-867.05	1746.10	1767.45	251.15	253.00
design + log_days_since_last_haul	1.00	-867.08	1746.15	1767.49	251.96	253.00
design + location_exposure	1.00	-867.16	1746.32	1767.66	252.23	253.00
Exp_or_Cont + location_exposure	1.00	-867.17	1746.33	1767.68	251.76	253.00
design + Exp_or_Cont	1.00	-867.26	1746.52	1767.86	252.70	253.00
depth_m + design + log_days_since_last_haul	1.00	-866.36	1746.73	1771.63	254.31	252.00
Exp_or_Cont + log_days_since_last_haul	1.00	-867.46	1746.92	1768.26	251.66	253.00
depth_m + design + Exp_or_Cont	1.00	-866.52	1747.03	1771.93	255.03	252.00
depth_m + design + location_exposure	1.00	-866.58	1747.17	1772.07	255.06	252.00
depth_m + location_exposure + log_days_since_last_haul	1.00	-866.66	1747.33	1772.22	253.06	252.00
depth_m + Exp_or_Cont + location_exposure	1.00	-866.74	1747.48	1772.38	253.70	252.00
depth_m + Exp_or_Cont + log_days_since_last_haul	1.00	-866.91	1747.82	1772.71	253.55	252.00
design + location_exposure + log_days_since_last_haul	1.00	-866.97	1747.95	1772.85	251.46	252.00
Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-867.01	1748.02	1772.92	250.96	252.00
design + Exp_or_Cont + log_days_since_last_haul	1.00	-867.06	1748.11	1773.01	251.86	252.00
design + Exp_or_Cont + location_exposure	1.00	-867.12	1748.24	1773.14	252.04	252.00
depth_m + design + Exp_or_Cont + log_days_since_last_haul	1.00	-866.29	1748.58	1777.04	254.17	251.00
depth_m + design + location_exposure + log_days_since_last_haul	1.00	-866.36	1748.73	1777.18	254.30	251.00
depth_m + design + Exp_or_Cont + location_exposure	1.00	-866.51	1749.02	1777.48	254.84	251.00
depth_m + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-866.58	1749.16	1777.62	252.85	251.00
design + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-866.94	1749.88	1778.33	251.27	251.00
depth_m + design + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-866.29	1750.58	1782.59	254.07	250.00

Predicting number of fish in trap haul



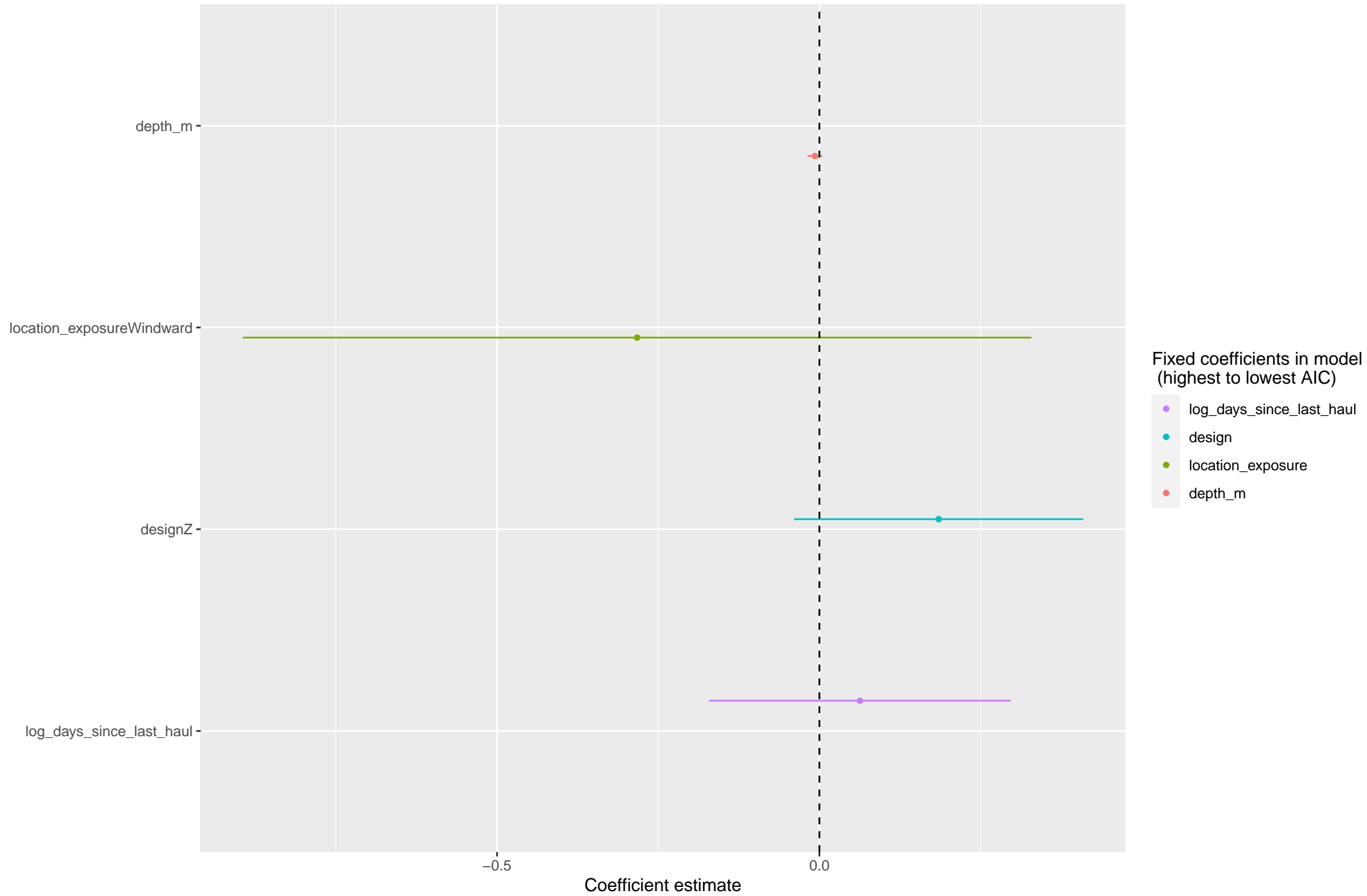
Fixed coefficients in model (highest to lowest AIC)

- depth_m + design + Exp_or_Cont + location_exposure + log_days_since_last_haul
- design + Exp_or_Cont + location_exposure + log_days_since_last_haul
- depth_m + Exp_or_Cont + location_exposure + log_days_since_last_haul
- depth_m + design + Exp_or_Cont + location_exposure
- depth_m + design + location_exposure + log_days_since_last_haul
- depth_m + design + Exp_or_Cont + log_days_since_last_haul
- design + Exp_or_Cont + location_exposure
- design + Exp_or_Cont + log_days_since_last_haul
- Exp_or_Cont + location_exposure + log_days_since_last_haul
- design + location_exposure + log_days_since_last_haul
- depth_m + Exp_or_Cont + log_days_since_last_haul
- depth_m + Exp_or_Cont + location_exposure
- depth_m + location_exposure + log_days_since_last_haul
- depth_m + design + location_exposure
- depth_m + design + Exp_or_Cont
- Exp_or_Cont + log_days_since_last_haul
- depth_m + design + log_days_since_last_haul
- design + Exp_or_Cont
- Exp_or_Cont + location_exposure
- design + location_exposure
- design + log_days_since_last_haul
- location_exposure + log_days_since_last_haul
- depth_m + Exp_or_Cont
- depth_m + log_days_since_last_haul
- depth_m + location_exposure
- depth_m + design
- Exp_or_Cont
- log_days_since_last_haul
- design
- location_exposure
- depth_m

Models with delta AIC <2

model	sigma	logLik	AIC	BIC	deviance	df.residual
none	1.00	−867.61	1743.22	1757.45	252.56	255.00
depth_m	1.00	−867.09	1744.18	1761.97	254.53	254.00
location_exposure	1.00	−867.21	1744.42	1762.20	251.95	254.00
design	1.00	−867.28	1744.56	1762.34	252.80	254.00
log_days_since_last_haul	1.00	−867.47	1744.95	1762.73	251.74	254.00

Predicting number of fish in trap haul



(Intercept)

Random effect quantiles

0.4

0.0

-0.4

-2

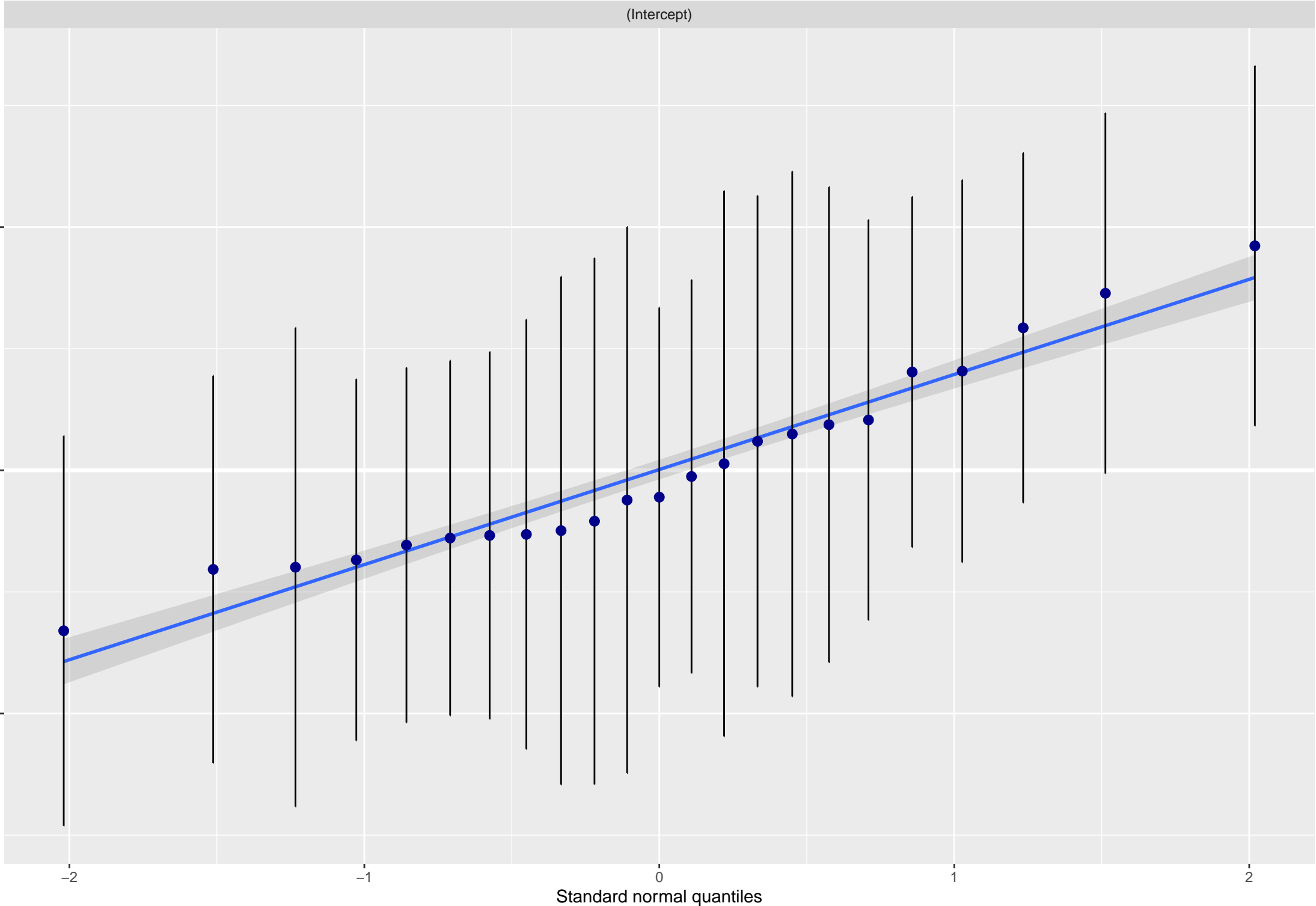
-1

0

1

2

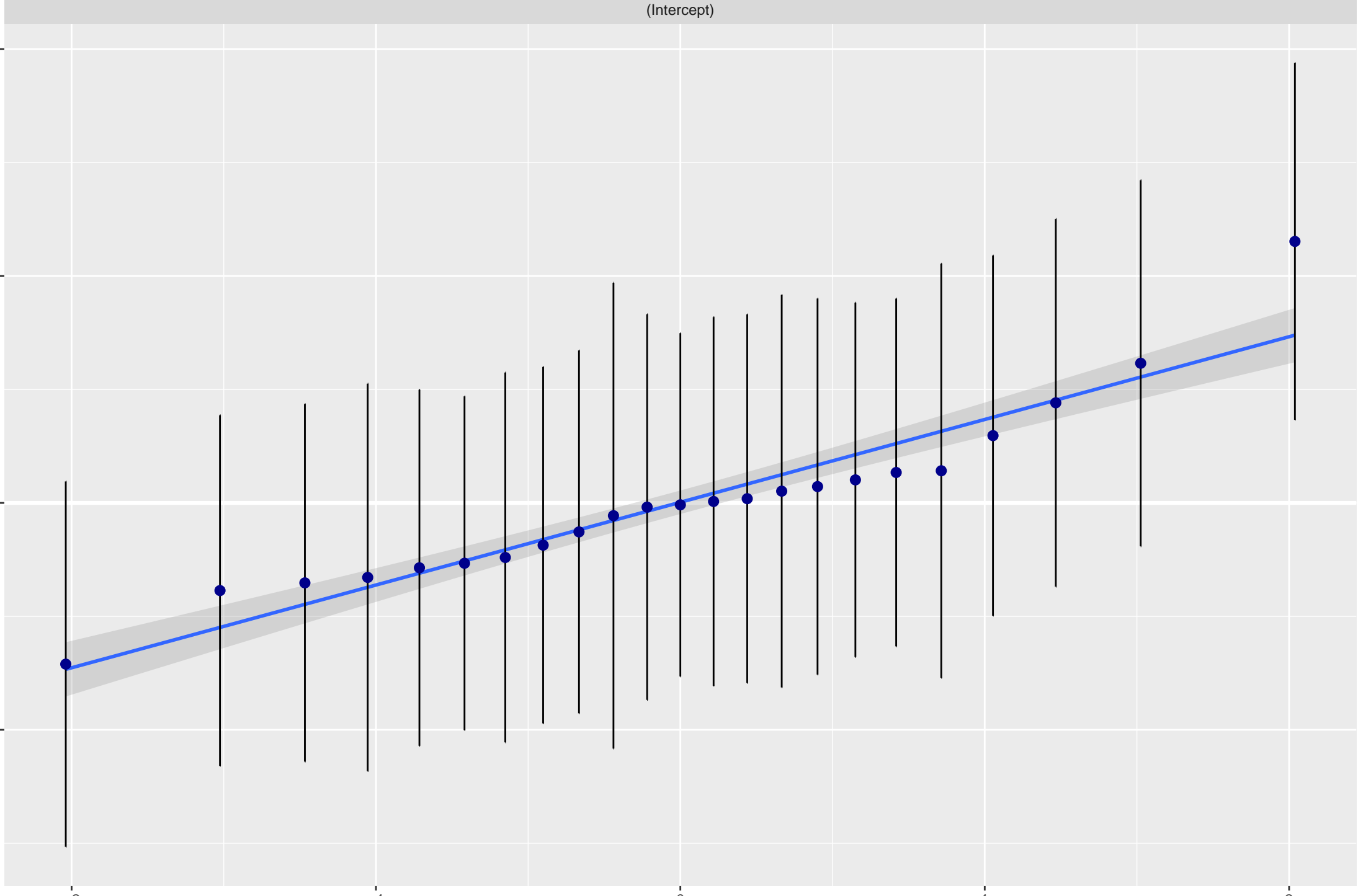
Standard normal quantiles



(Intercept)

Random effect quantiles

Standard normal quantiles



(Intercept)

Random effect quantiles

0.6
0.3
0.0
-0.3

-2

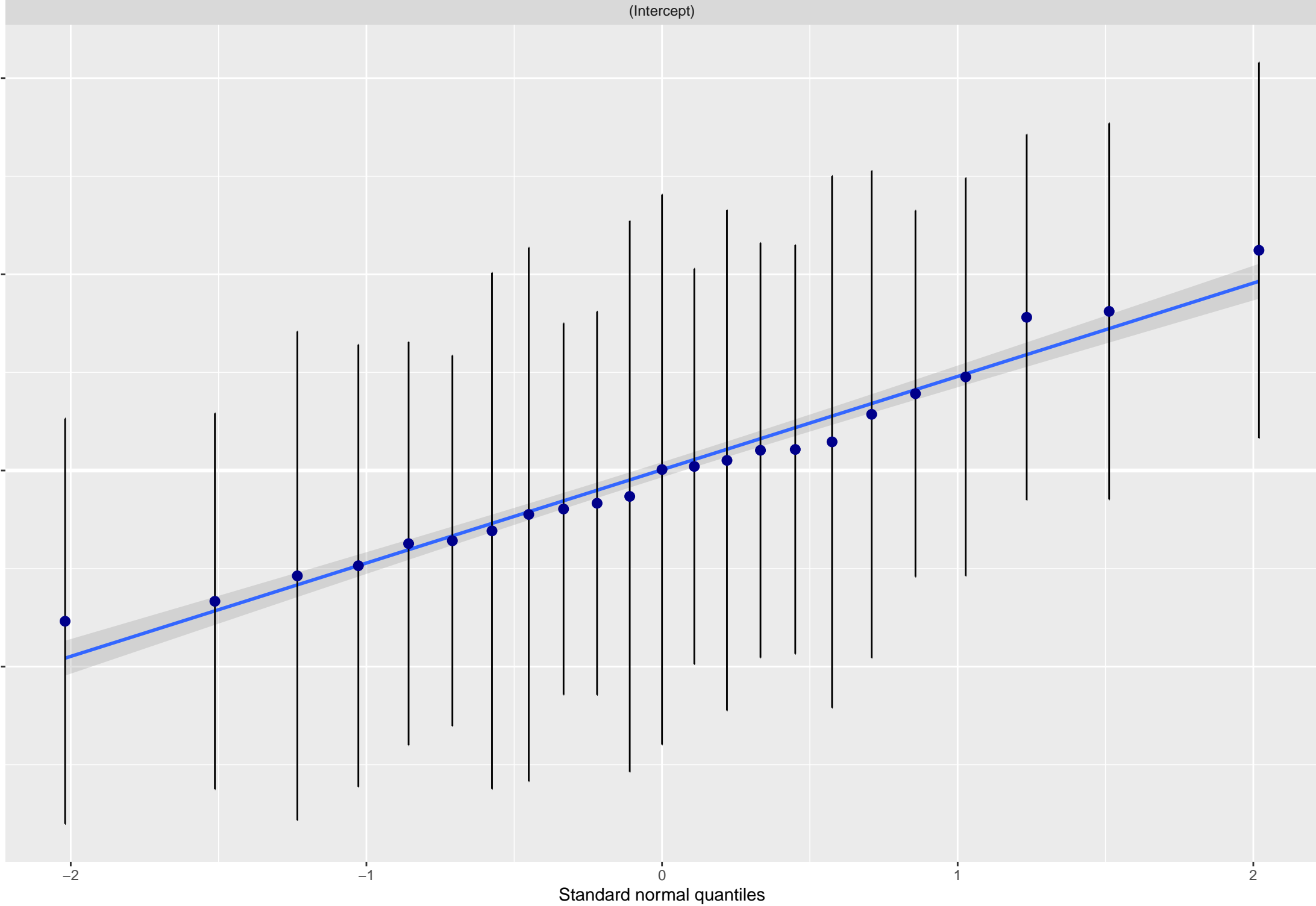
-1

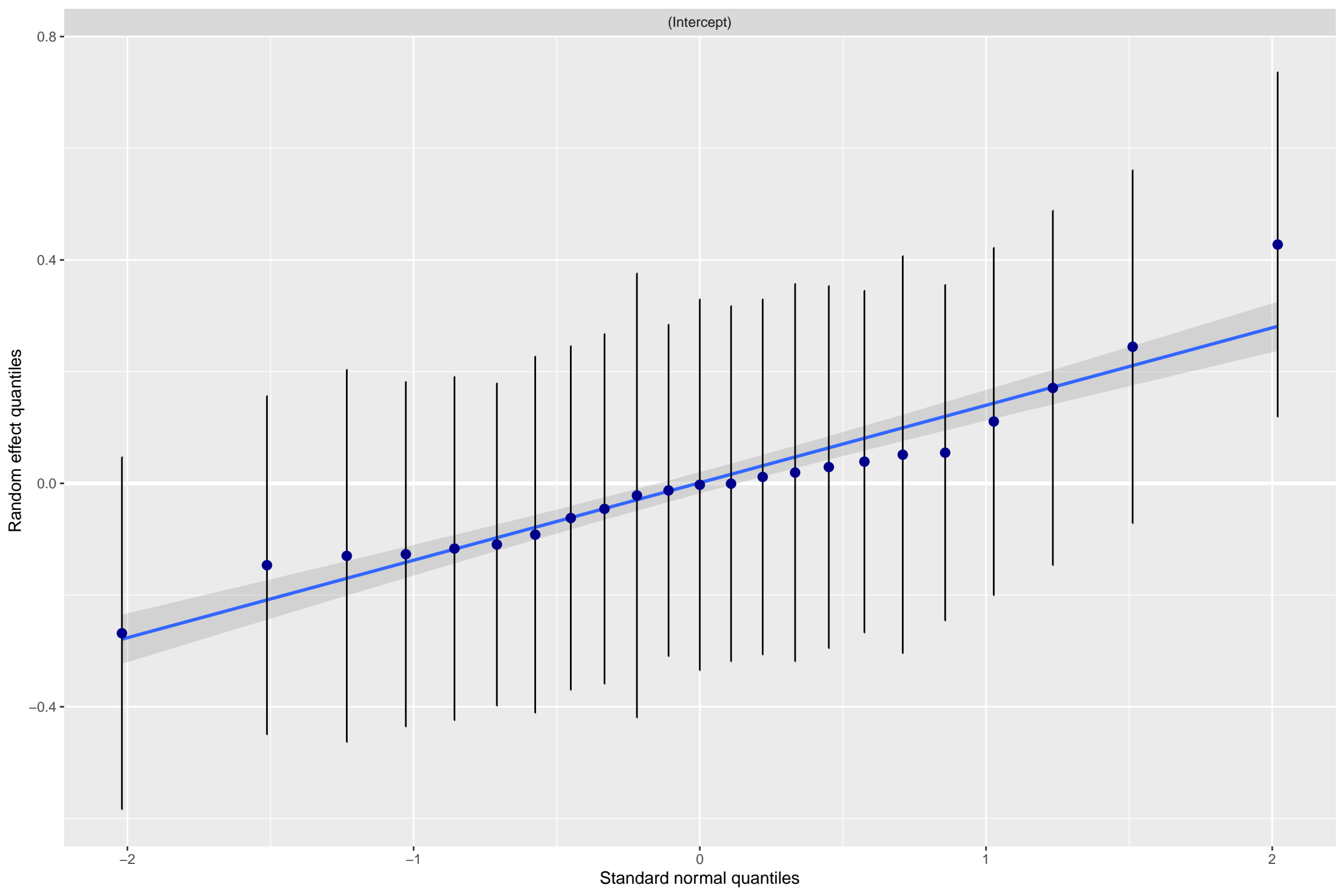
0

1

2

Standard normal quantiles





(Intercept)

Random effect quantiles

0.4

0.0

-0.4

-2

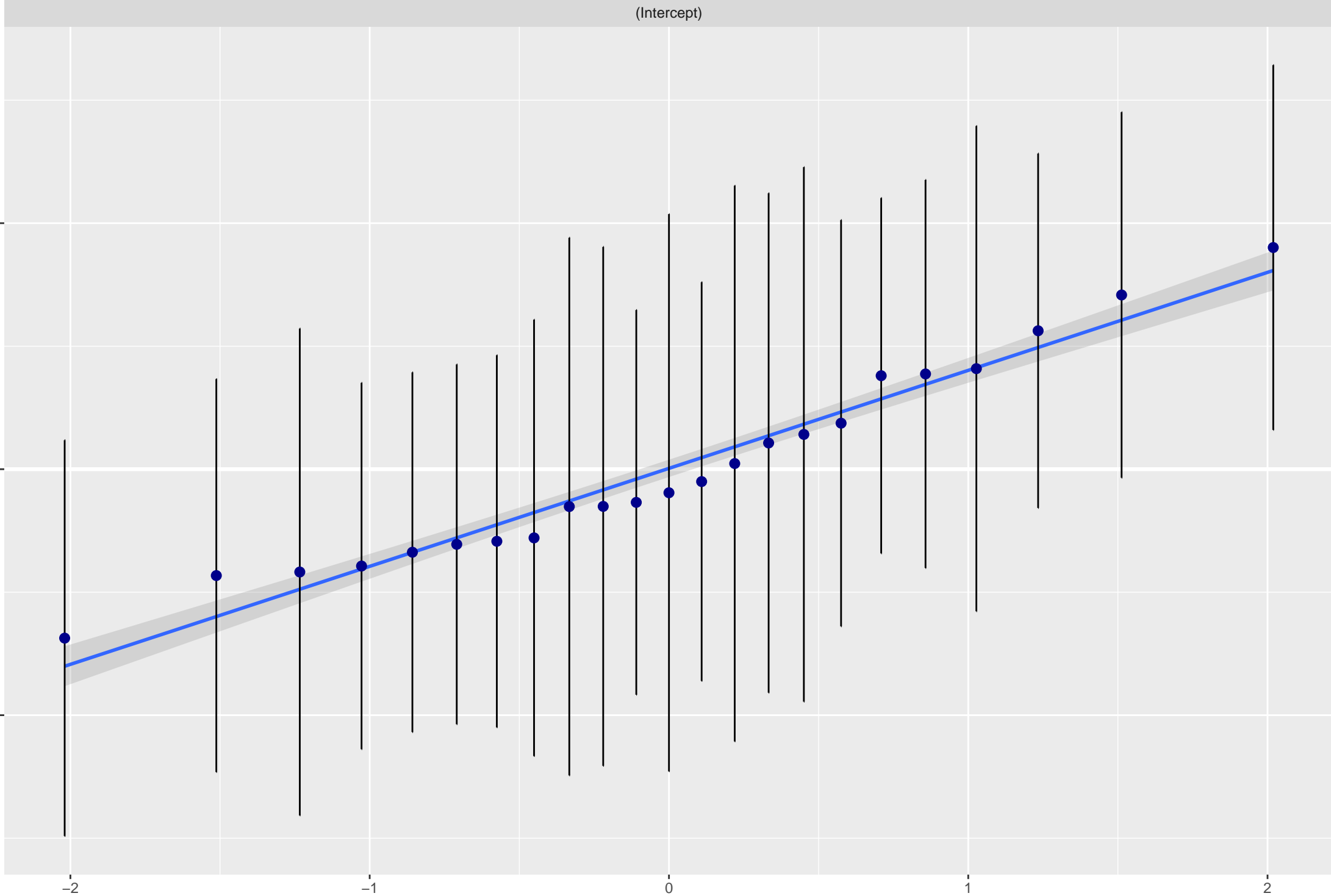
-1

0

1

2

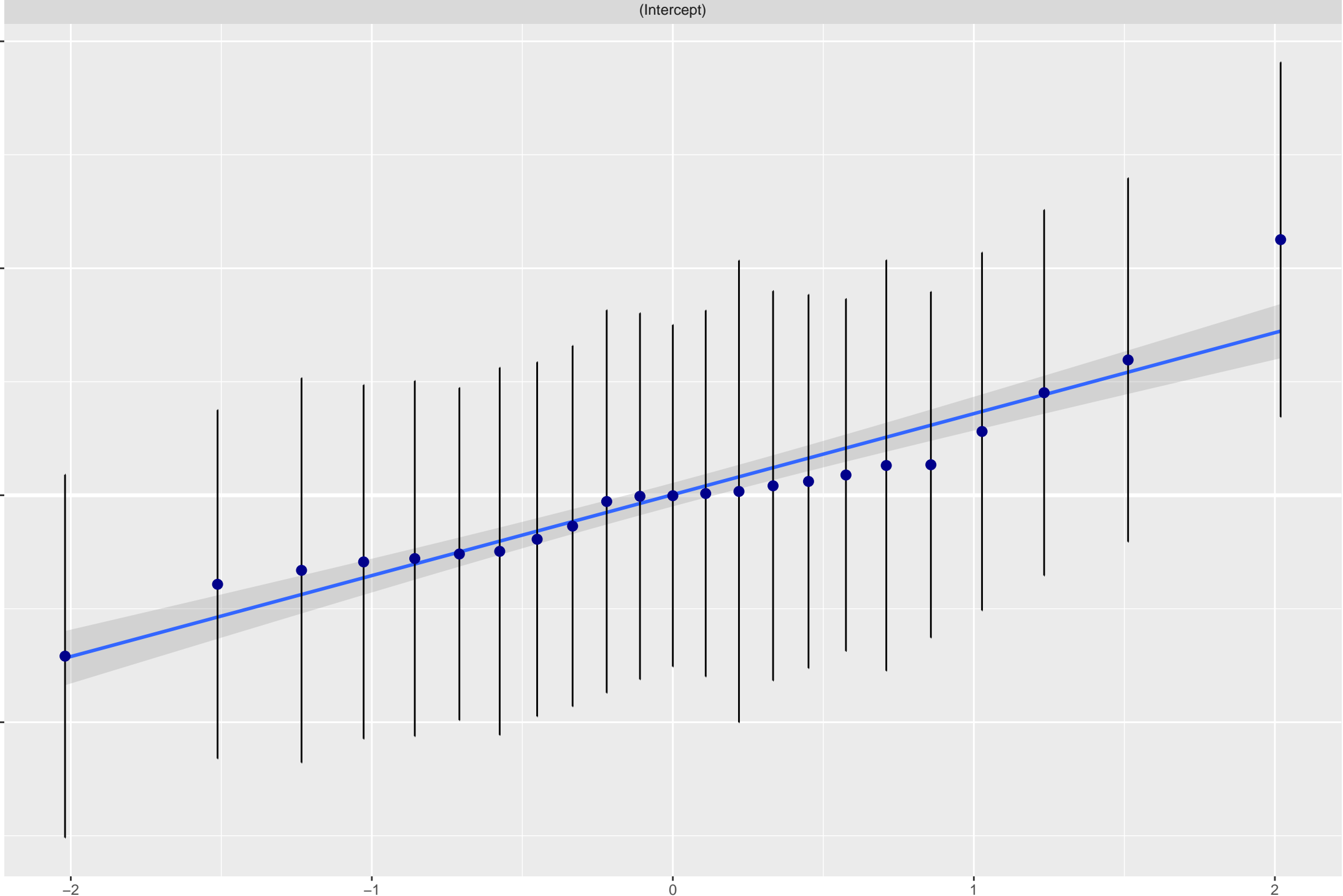
Standard normal quantiles



(Intercept)

Random effect quantiles

Standard normal quantiles



(Intercept)

Random effect quantiles

0.4

0.0

-0.4

-2

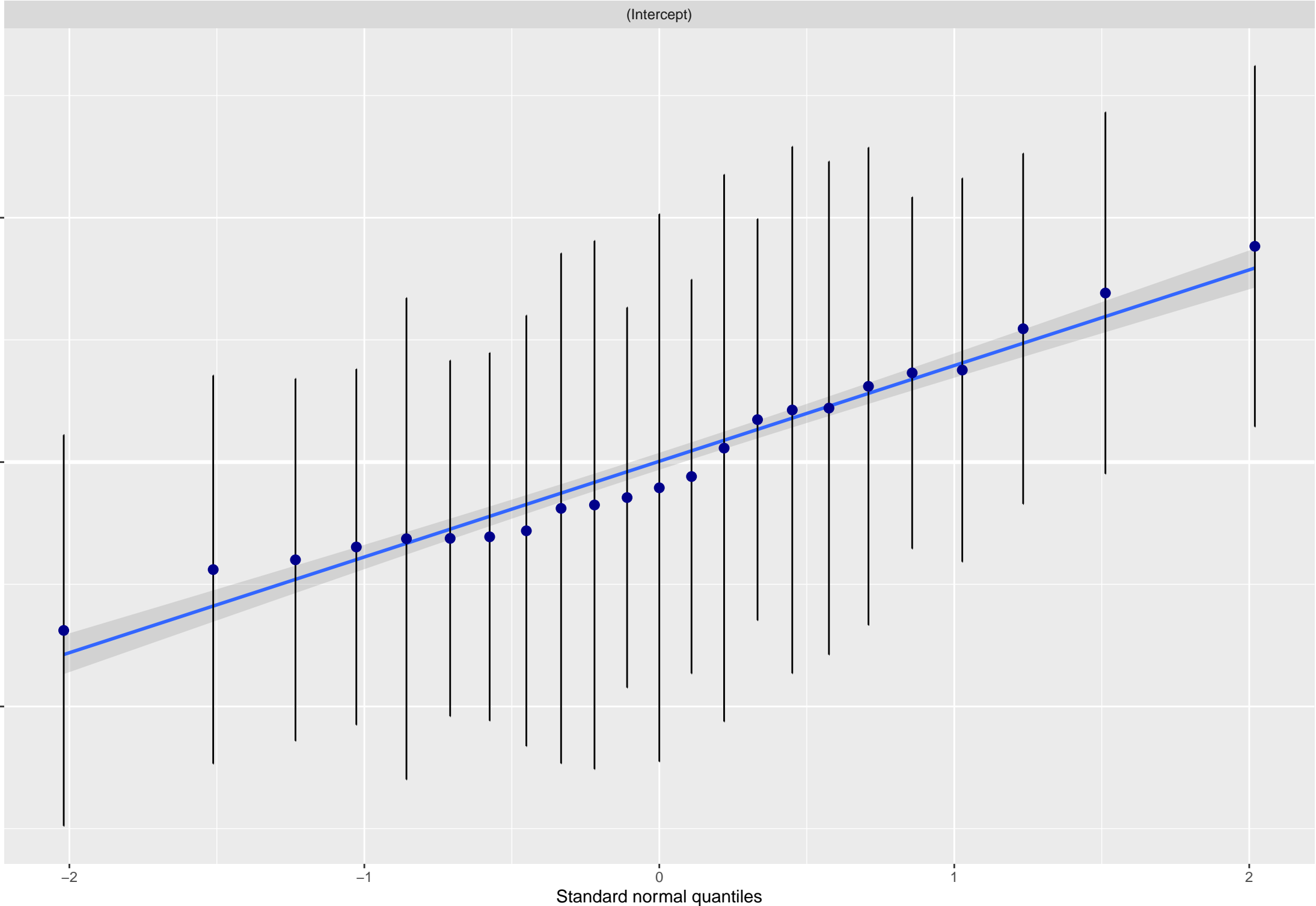
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.8

0.4

0.0

-0.4

-2

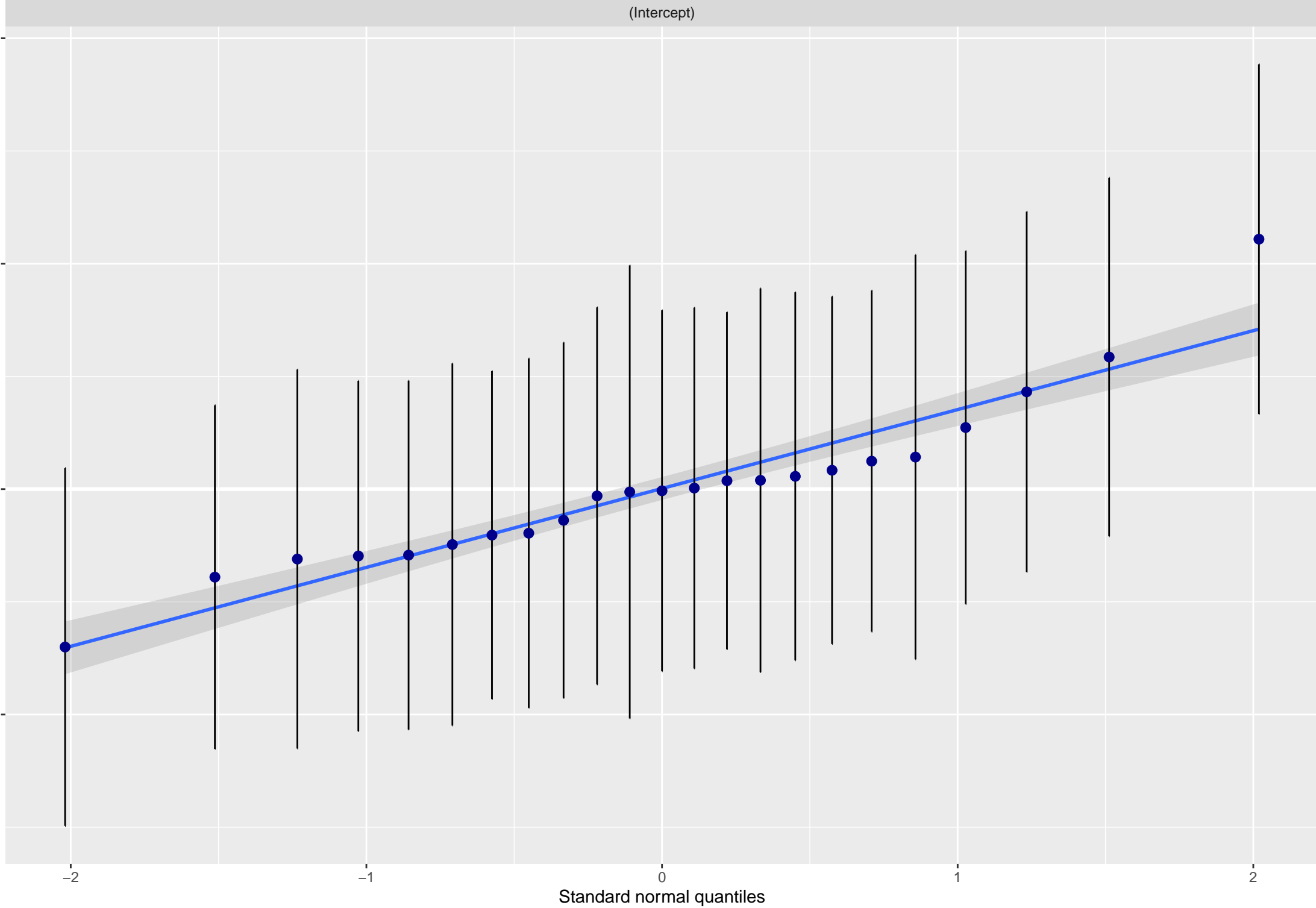
-1

0

1

2

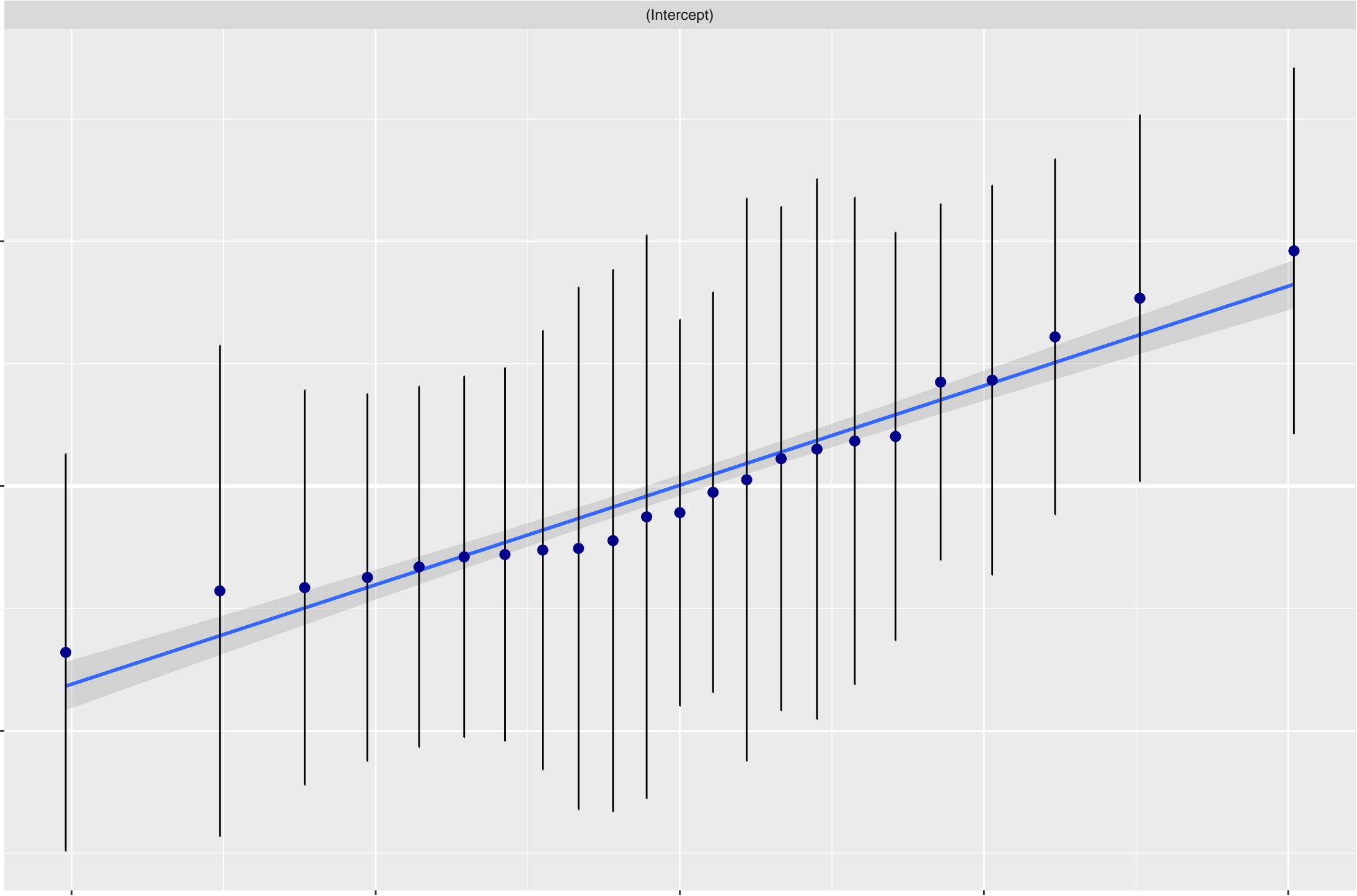
Standard normal quantiles



(Intercept)

Random effect quantiles

Standard normal quantiles



(Intercept)

Random effect quantiles

0.8
0.4
0.0
-0.4

-2

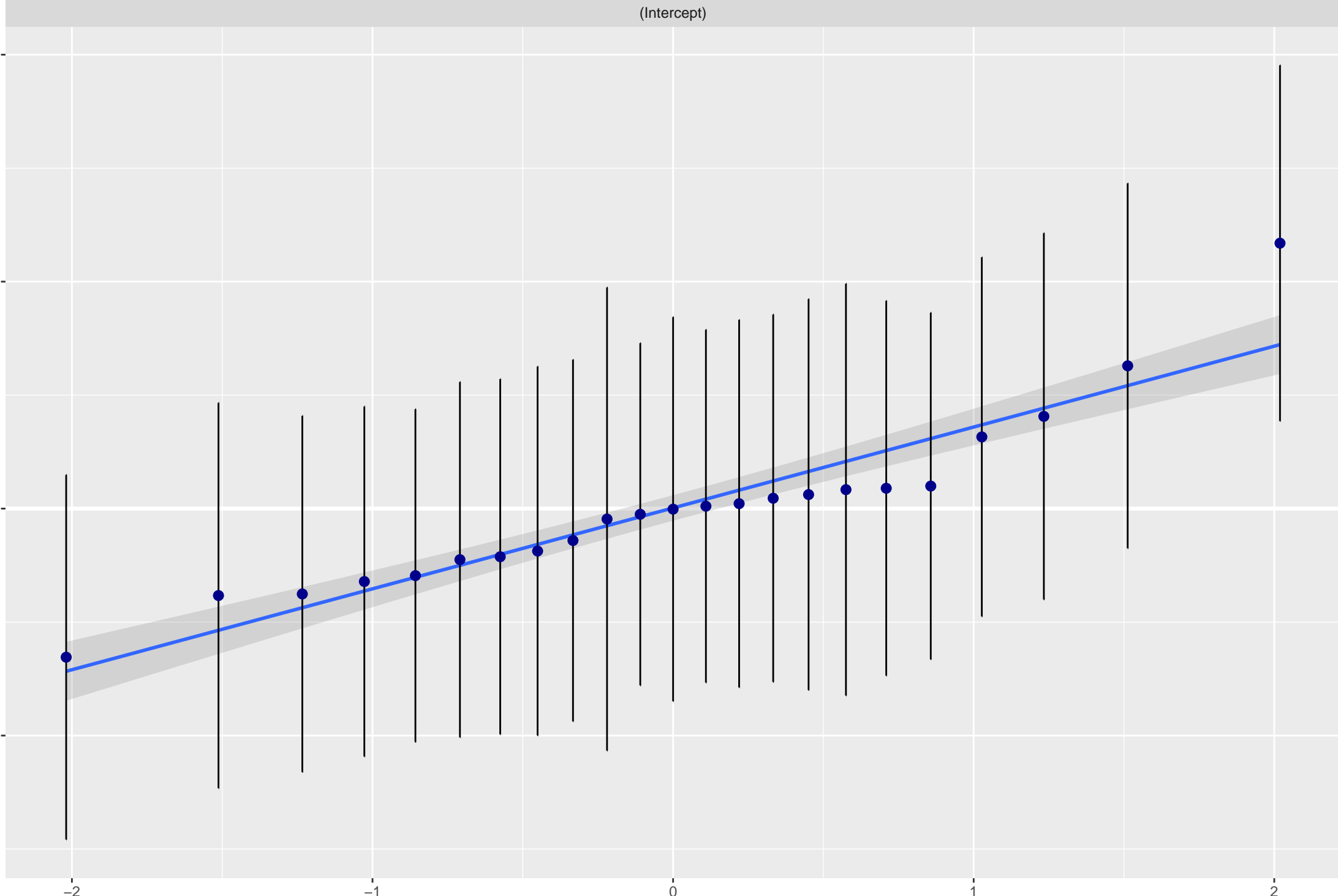
-1

0

1

2

Standard normal quantiles



Model summaries for all models with delta AIC < 2

```
$none
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.8498) ( log )
Formula: no_fish ~ (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

           AIC      BIC    logLik deviance df.resid
1743.2    1757.5    -867.6   1735.2      255

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.1835 -0.7597 -0.2595  0.6162  5.2071

Random effects:
Groups Name Variance Std.Dev.
TrapID (Intercept) 0.05675 0.2382
Date_YMD (Intercept) 0.05012 0.2239
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  2.27959      0.09075   25.12 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

$depth_m
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.8498) ( log )
Formula: no_fish ~ depth_m + (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

           AIC      BIC    logLik deviance df.resid
1744.2    1762.0    -867.1   1734.2      254

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.1719 -0.7609 -0.2652  0.5783  4.9948

Random effects:
Groups Name Variance Std.Dev.
TrapID (Intercept) 0.04946 0.2224
Date_YMD (Intercept) 0.04670 0.2161
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  2.529861    0.222626  11.364 <2e-16 ***
depth_m      -0.006953    0.005877   -1.183 0.237
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
depth_m -0.918

$location_exposure
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.8498) ( log )
Formula: no_fish ~ location_exposure + (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

           AIC      BIC    logLik deviance df.resid
1744.4    1762.2    -867.2   1734.4      254

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.1828 -0.7651 -0.2528  0.6155  5.2196

Random effects:
Groups Name Variance Std.Dev.
TrapID (Intercept) 0.05769 0.2402
Date_YMD (Intercept) 0.04883 0.2210
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  2.23815      0.09243   24.865 <2e-16 ***
location_exposureWindward -0.28276    0.31207  -0.906 0.365
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
lctn_xperWm -0.222
```

```
$design
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.8498) ( log )
Formula: no_fish ~ design + (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

           AIC      BIC    logLik deviance df.resid
1744.6    1762.3    -867.3   1734.6      254

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.1823 -0.7678 -0.2561  0.5847  5.2305

Random effects:
Groups Name Variance Std.Dev.
TrapID (Intercept) 0.05638 0.2374
Date_YMD (Intercept) 0.04763 0.2182
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  2.12090      0.07563  28.045 <2e-16 ***
designZ       0.18495      0.11450   1.615 0.106
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
designZ -0.576
optimizer (bobyqa) convergence code: 0 (OK)
unable to evaluate scaled gradient
Model failed to converge: degenerate Hessian with 1 negative eigenvalues

$log_days_since_last_haul
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.8498) ( log )
Formula: no_fish ~ log_days_since_last_haul + (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

           AIC      BIC    logLik deviance df.resid
1744.9    1762.7    -867.5   1734.9      254

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.1798 -0.7646 -0.2619  0.5864  5.3008

Random effects:
Groups Name Variance Std.Dev.
TrapID (Intercept) 0.05989 0.2447
Date_YMD (Intercept) 0.04937 0.2222
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  2.13762      0.28522   7.494 6.66e-14 ***
log_days_since_last_haul 0.06275    0.11935   0.526 0.599
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
lg_dys_sn__ -0.947
```

Full model summary

```
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.8498) ( log )
Formula: no_fish ~ design + log_days_since_last_haul + location_exposure +
  Exp_or_Cont + depth_m + (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero_depth
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

          AIC          BIC    logLik deviance df.resid
1750.6      1782.6      -866.3   1732.6      250

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.1791 -0.7664 -0.2320  0.6180  5.1880

Random effects:
Groups Name Variance Std.Dev.
TrapID (Intercept) 0.05212 0.2283
Date_YMD (Intercept) 0.04164 0.2040
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    2.233958   0.445222   5.018 5.23e-07 ***
designZ          0.243447   0.314318   0.775   0.439
log_days_since_last_haul 0.077762   0.116563   0.667   0.505
location_exposureWindward -0.022806   0.434415  -0.052   0.958
Exp_or_ContExperimental -0.057962   0.151688  -0.382   0.702
depth_m        -0.008570   0.007343  -1.167   0.243
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) designZ lg_____ lctn_W Ex__CE
designZ    -0.532
lg_dys_wn_ -0.643  0.149
lctn_xparWn -0.341  0.690  0.069
Exp_r_CntEx -0.253  0.023 -0.014  0.115
depth_m    -0.328 -0.357 -0.069 -0.343  0.106
```