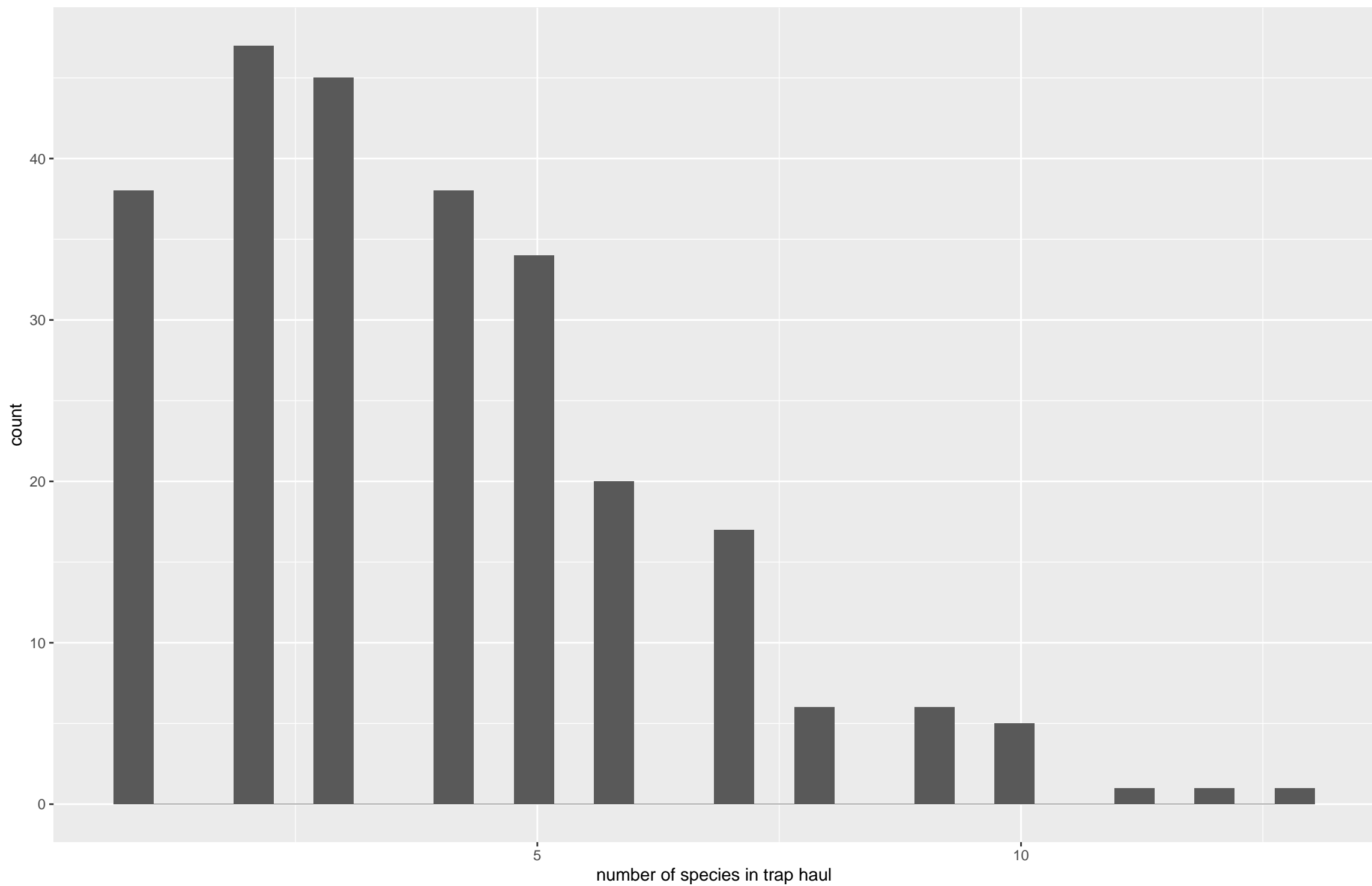
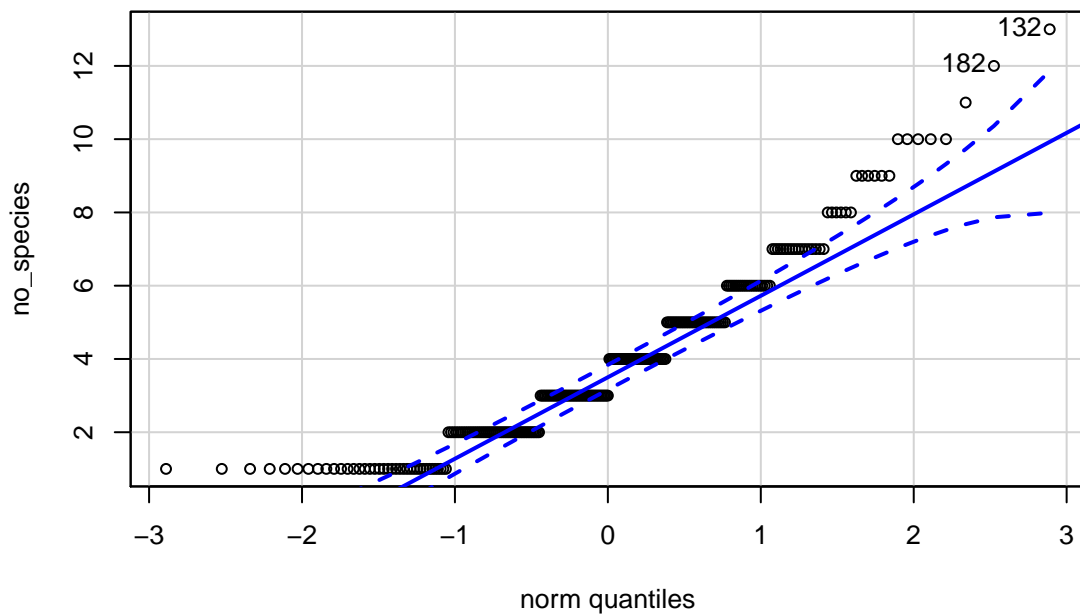


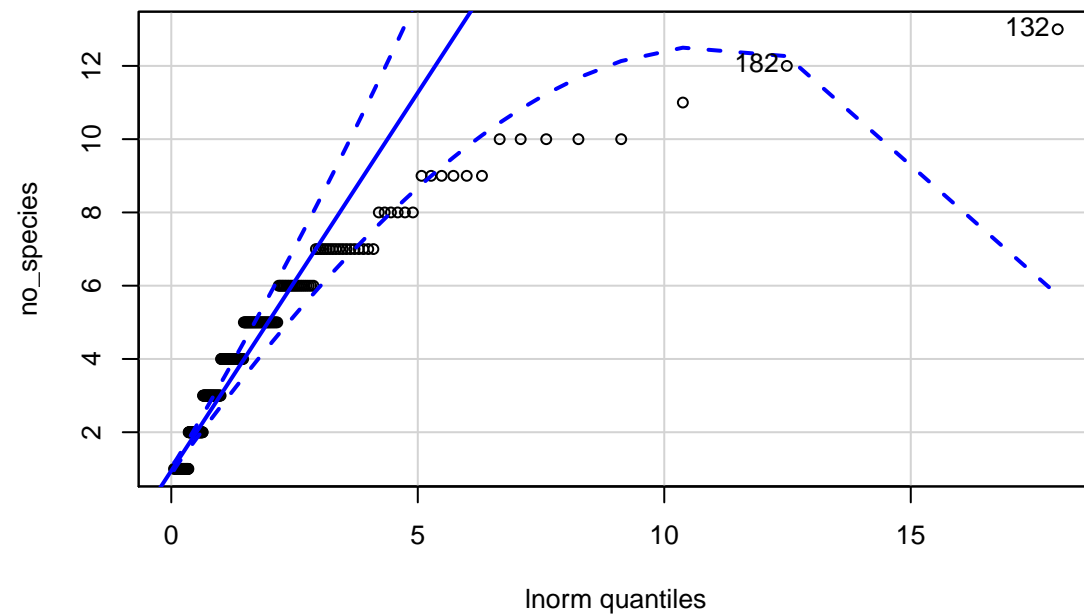
Histogram of number of species



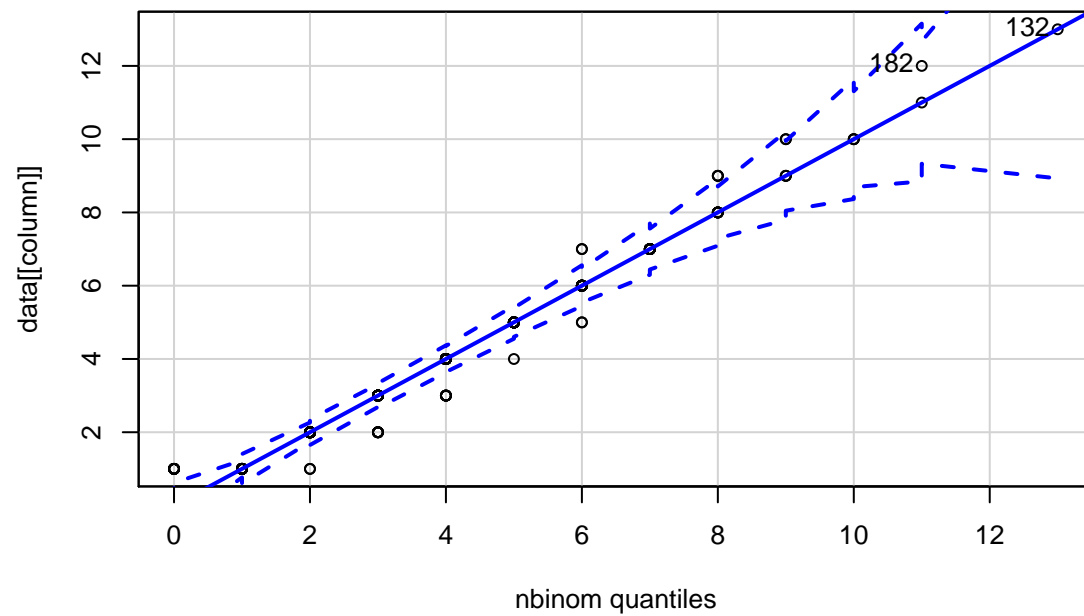
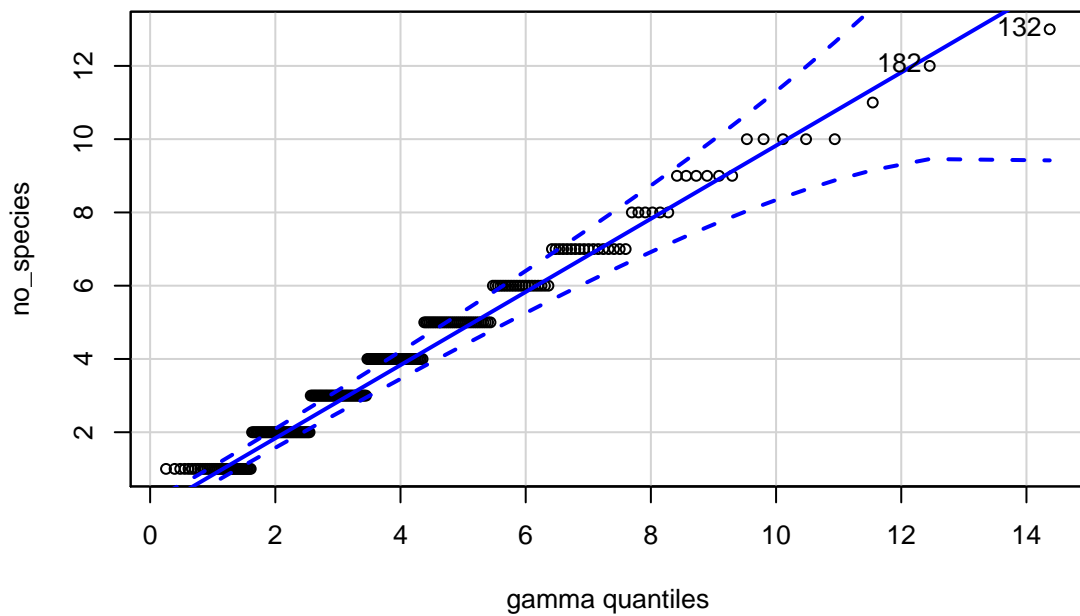
### Normal distribution

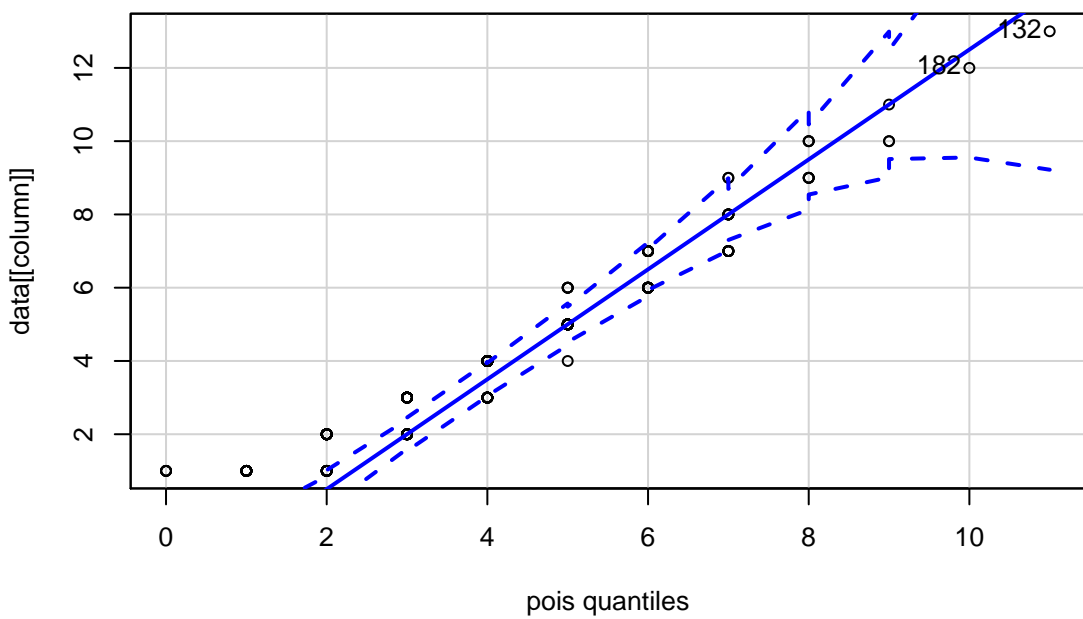


### Log-normal distribution



### Gamma distribution





```
Global model call: glmer(formula = no_species ~ 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 = 15.2932373229237),
  control = glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000)),
  na.action = "na.fail")
```

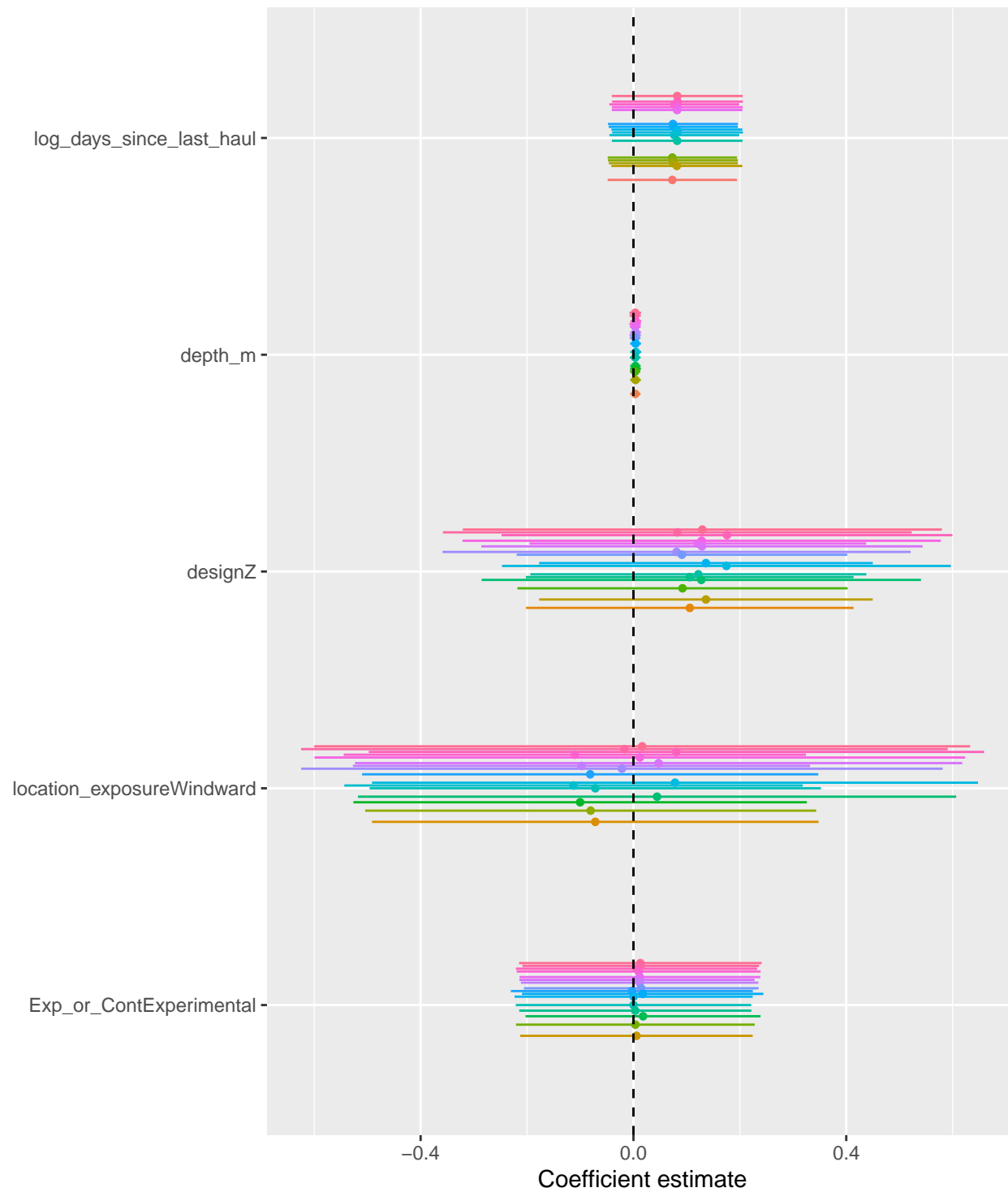
---

Model selection table

	(Int)	dpt_m	dsg	Exp_or_Cnt	lct_exp	log_dys_snc_lst_hal	df	logLik
1	1.3270						4	-563.059
17	1.1610					0.07310	5	-562.403
2	1.2020	0.003538					5	-562.806
3	1.2380		+				5	-562.829
9	1.3320				+		5	-563.002
5	1.3240			+			5	-563.057
19	1.0270		+			0.08160	6	-562.036
18	1.0190	0.003872				0.07492	6	-562.115
25	1.1640				+	0.07421	6	-562.333
21	1.1590			+		0.07307	6	-562.402
4	1.1380	0.003125	+				6	-562.635
10	1.1940	0.003944			+		6	-562.698
6	1.1880	0.003661		+			6	-562.793
11	1.2160		+		+		6	-562.817
7	1.2360		+	+			6	-562.829
20	0.9195	0.003332	+			0.08223	7	-561.826
13	1.3320			+	+		6	-563.002
26	1.0060	0.004355			+	0.07680	7	-561.982
27	0.9859		+		+	0.08288	7	-562.000
23	1.0270		+	+		0.08160	7	-562.036
22	1.0060	0.003993		+		0.07486	7	-562.104
29	1.1660			+	+	0.07425	7	-562.333
8	1.1280	0.003229	+	+			7	-562.626
12	1.1440	0.003263	+		+		7	-562.632
14	1.1860	0.004017		+	+		7	-562.692
15	1.2110		+	+	+		7	-562.815
24	0.9110	0.003419	+	+		0.08212	8	-561.820
28	0.9157	0.003254	+		+	0.08240	8	-561.825
30	0.9993	0.004411		+	+	0.07672	8	-561.978
31	0.9818		+	+	+	0.08286	8	-561.999
16	1.1330	0.003330	+	+	+		8	-562.625
32	0.9053	0.003318	+	+	+	0.08234	9	-561.819
AICc delta weight								
1	1134.3	0.00	0.151					
17	1135.0	0.77	0.103					
2	1135.8	1.57	0.069					

model	sigma	logLik	AIC	BIC	deviance	df.residual
none	1.00	-563.06	1134.12	1148.34	240.94	255.00
log_days_since_last_haul	1.00	-562.40	1134.81	1152.59	241.68	254.00
depth_m	1.00	-562.81	1135.61	1153.40	240.70	254.00
design	1.00	-562.83	1135.66	1153.44	240.08	254.00
location_exposure	1.00	-563.00	1136.00	1153.79	240.38	254.00
Exp_or_Cont	1.00	-563.06	1136.11	1153.90	240.93	254.00
design + log_days_since_last_haul	1.00	-562.04	1136.07	1157.41	240.99	253.00
depth_m + log_days_since_last_haul	1.00	-562.12	1136.23	1157.57	241.51	253.00
location_exposure + log_days_since_last_haul	1.00	-562.33	1136.67	1158.01	241.14	253.00
Exp_or_Cont + log_days_since_last_haul	1.00	-562.40	1136.80	1158.15	241.67	253.00
depth_m + design	1.00	-562.63	1137.27	1158.61	239.98	253.00
depth_m + location_exposure	1.00	-562.70	1137.40	1158.74	239.83	253.00
depth_m + Exp_or_Cont	1.00	-562.79	1137.59	1158.93	240.64	253.00
design + location_exposure	1.00	-562.82	1137.63	1158.98	240.25	253.00
design + Exp_or_Cont	1.00	-562.83	1137.66	1159.00	240.07	253.00
depth_m + design + log_days_since_last_haul	1.00	-561.83	1137.65	1162.55	240.92	252.00
Exp_or_Cont + location_exposure	1.00	-563.00	1138.00	1159.34	240.38	253.00
depth_m + location_exposure + log_days_since_last_haul	1.00	-561.98	1137.96	1162.86	240.67	252.00
design + location_exposure + log_days_since_last_haul	1.00	-562.00	1138.00	1162.90	241.33	252.00
design + Exp_or_Cont + log_days_since_last_haul	1.00	-562.04	1138.07	1162.97	240.99	252.00
depth_m + Exp_or_Cont + log_days_since_last_haul	1.00	-562.10	1138.21	1163.11	241.45	252.00
Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-562.33	1138.67	1163.56	241.14	252.00
depth_m + design + Exp_or_Cont	1.00	-562.63	1139.25	1164.15	239.95	252.00
depth_m + design + location_exposure	1.00	-562.63	1139.26	1164.16	239.88	252.00
depth_m + Exp_or_Cont + location_exposure	1.00	-562.69	1139.38	1164.28	239.82	252.00
design + Exp_or_Cont + location_exposure	1.00	-562.82	1139.63	1164.53	240.25	252.00
depth_m + design + Exp_or_Cont + log_days_since_last_haul	1.00	-561.82	1139.64	1168.10	240.89	251.00
depth_m + design + location_exposure + log_days_since_last_haul	1.00	-561.83	1139.65	1168.11	240.98	251.00
depth_m + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-561.98	1139.96	1168.41	240.66	251.00
design + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-562.00	1140.00	1168.45	241.34	251.00
depth_m + design + Exp_or_Cont + location_exposure	1.00	-562.62	1141.25	1169.70	239.87	251.00
depth_m + design + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-561.82	1141.64	1173.65	240.97	250.00

# Predicting number of species in trap haul



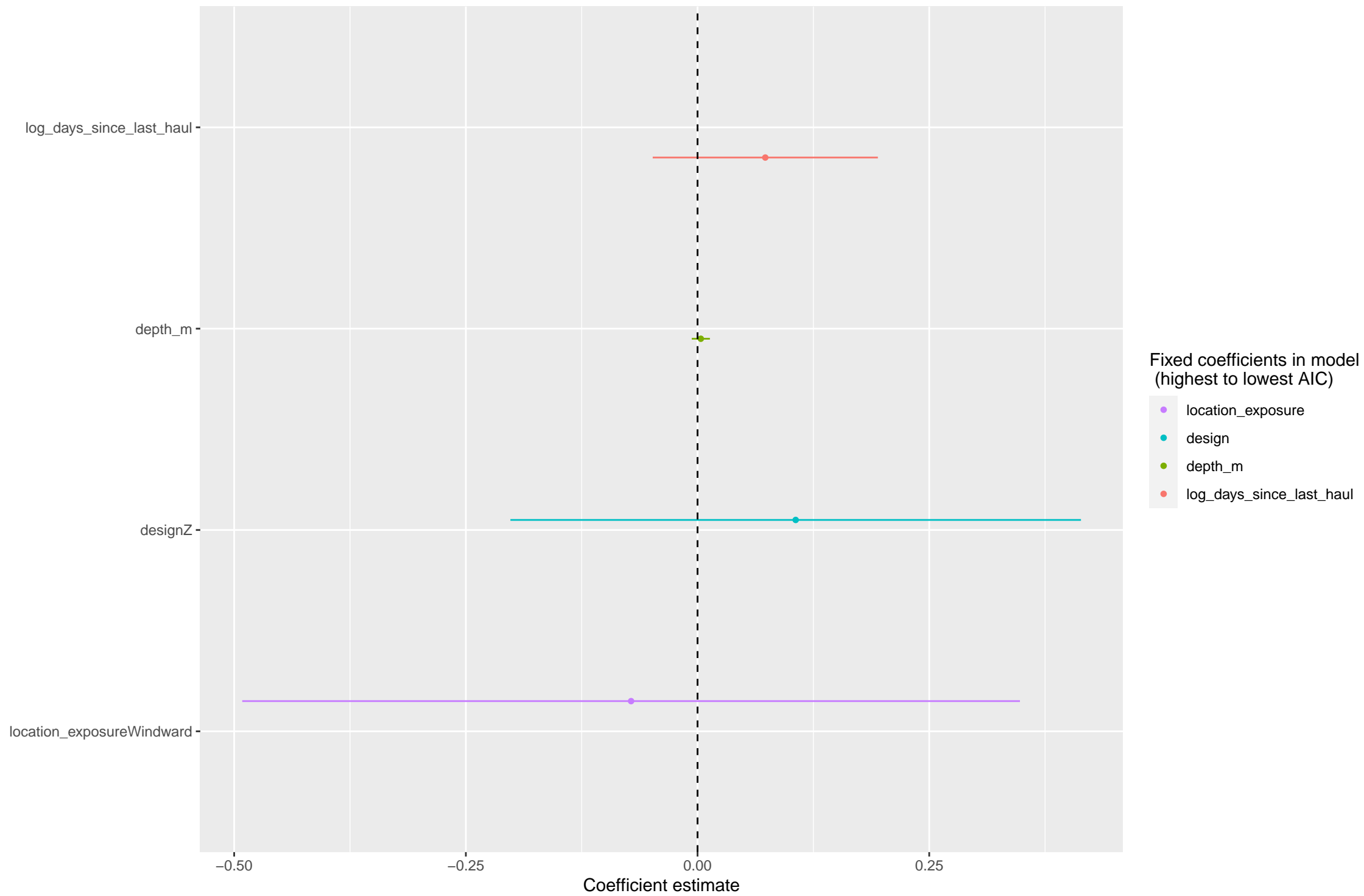
## Fixed coefficients in model (highest to lowest AIC)

- depth\_m + design + Exp\_or\_Cont + location\_exposure + log\_days\_since\_last\_haul
- depth\_m + design + Exp\_or\_Cont + location\_exposure
- 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 + location\_exposure + log\_days\_since\_last\_haul
- depth\_m + design + Exp\_or\_Cont + log\_days\_since\_last\_haul
- design + Exp\_or\_Cont + location\_exposure
- depth\_m + Exp\_or\_Cont + location\_exposure
- depth\_m + design + location\_exposure
- depth\_m + design + Exp\_or\_Cont
- Exp\_or\_Cont + location\_exposure + log\_days\_since\_last\_haul
- depth\_m + Exp\_or\_Cont + log\_days\_since\_last\_haul
- design + Exp\_or\_Cont + log\_days\_since\_last\_haul
- design + location\_exposure + log\_days\_since\_last\_haul
- depth\_m + location\_exposure + log\_days\_since\_last\_haul
- Exp\_or\_Cont + location\_exposure
- depth\_m + design + log\_days\_since\_last\_haul
- design + Exp\_or\_Cont
- design + location\_exposure
- depth\_m + Exp\_or\_Cont
- depth\_m + location\_exposure
- depth\_m + design
- Exp\_or\_Cont + log\_days\_since\_last\_haul
- location\_exposure + log\_days\_since\_last\_haul
- depth\_m + log\_days\_since\_last\_haul
- design + log\_days\_since\_last\_haul
- Exp\_or\_Cont
- location\_exposure
- design
- depth\_m
- log\_days\_since\_last\_haul

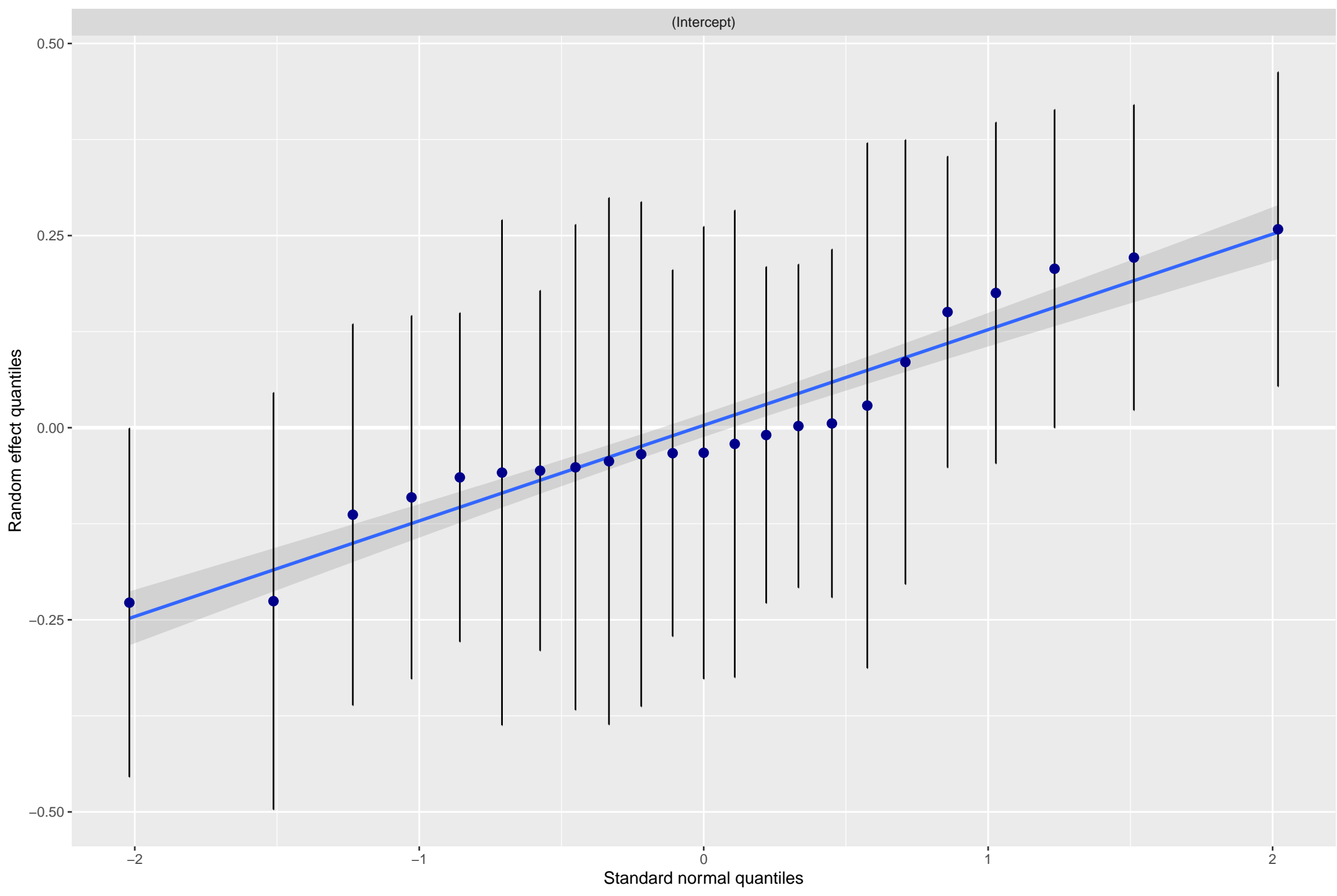
### Models with delta AIC <2

<b>model</b>	<b>sigma</b>	<b>logLik</b>	<b>AIC</b>	<b>BIC</b>	<b>deviance</b>	<b>df.residual</b>
none	1.00	−563.06	1134.12	1148.34	240.94	255.00
log_days_since_last_haul	1.00	−562.40	1134.81	1152.59	241.68	254.00
depth_m	1.00	−562.81	1135.61	1153.40	240.70	254.00
design	1.00	−562.83	1135.66	1153.44	240.08	254.00
location_exposure	1.00	−563.00	1136.00	1153.79	240.38	254.00

Predicting number of species in trap haul







(Intercept)

Random effect quantiles

0.1

0.0

-0.1

-2

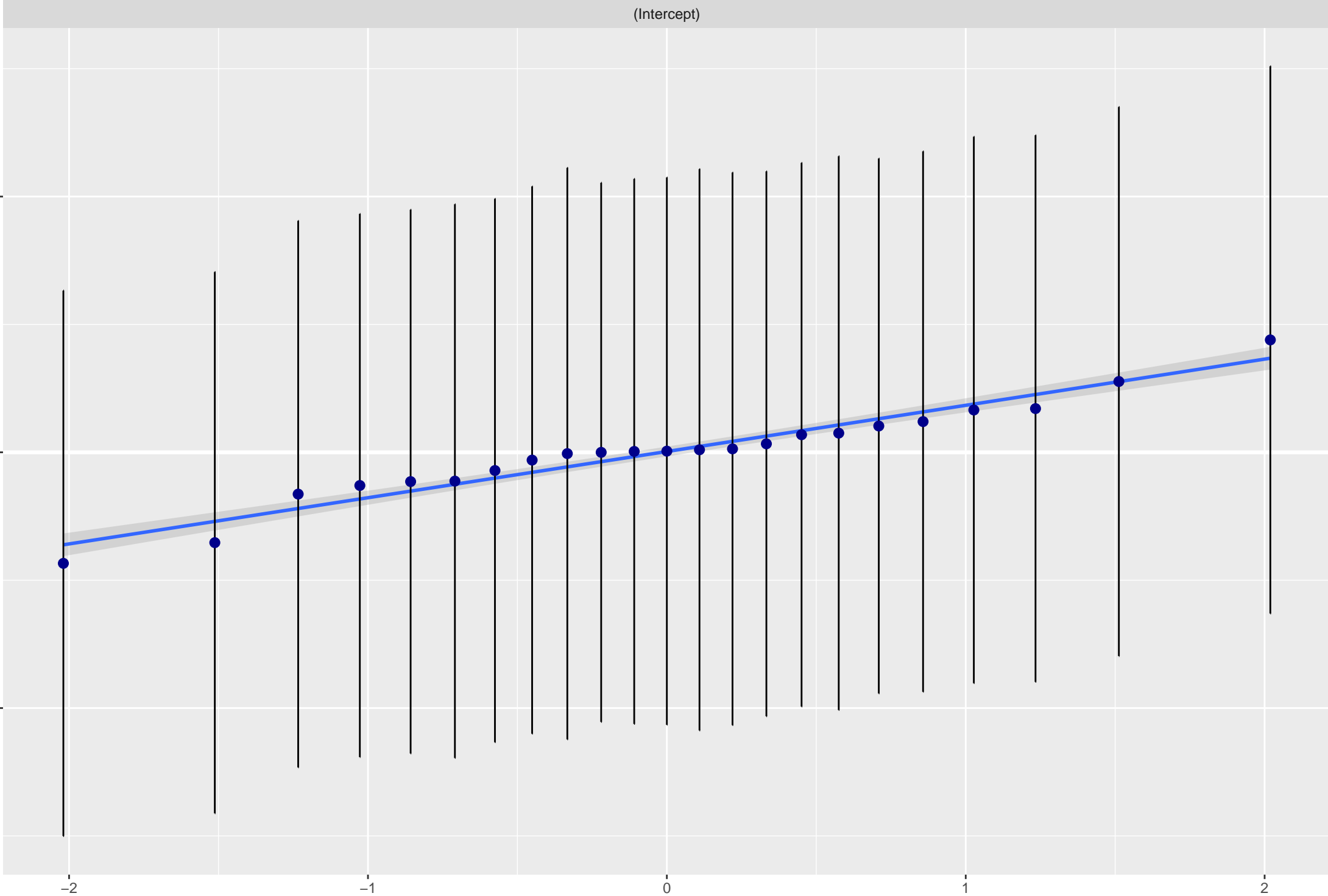
-1

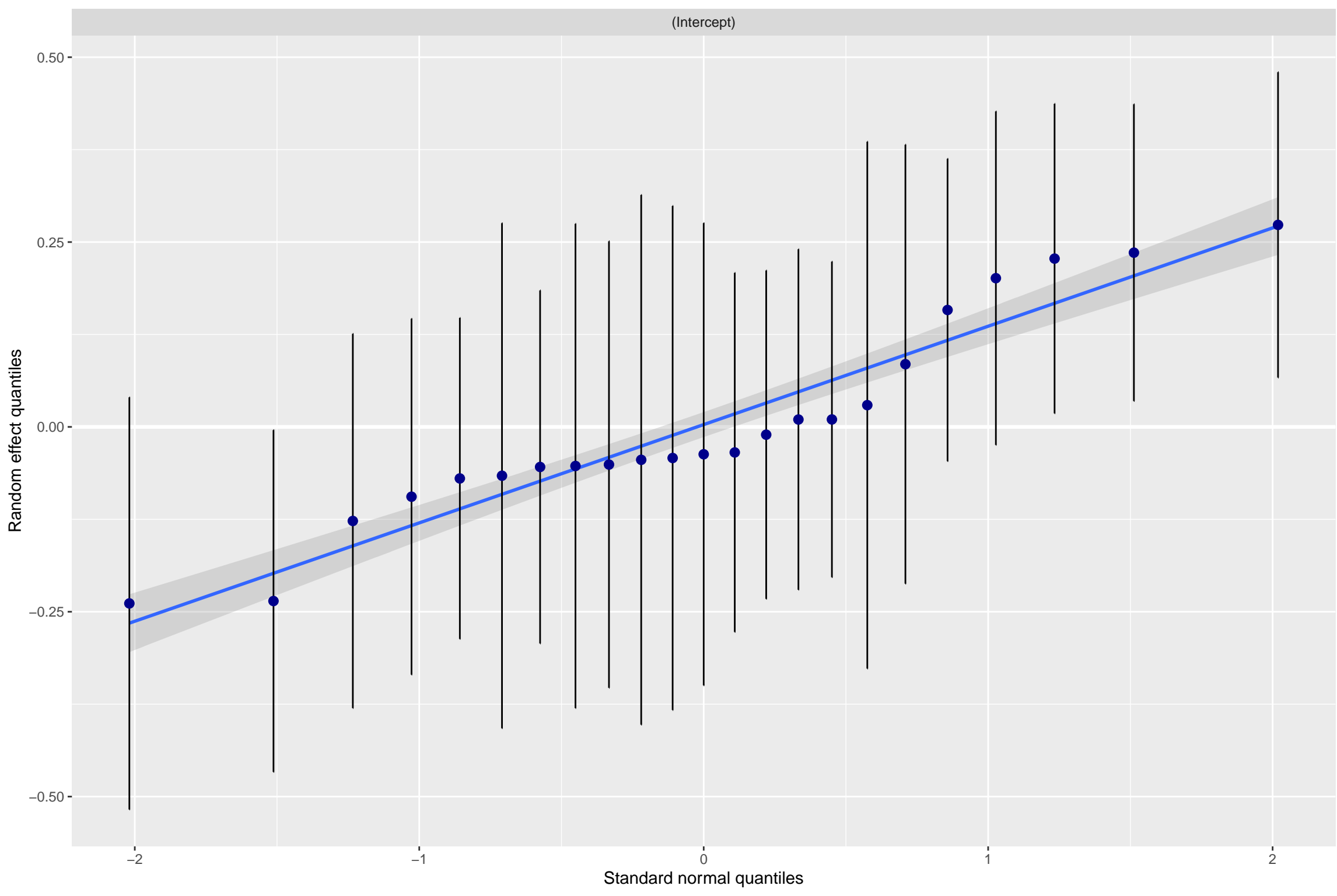
0

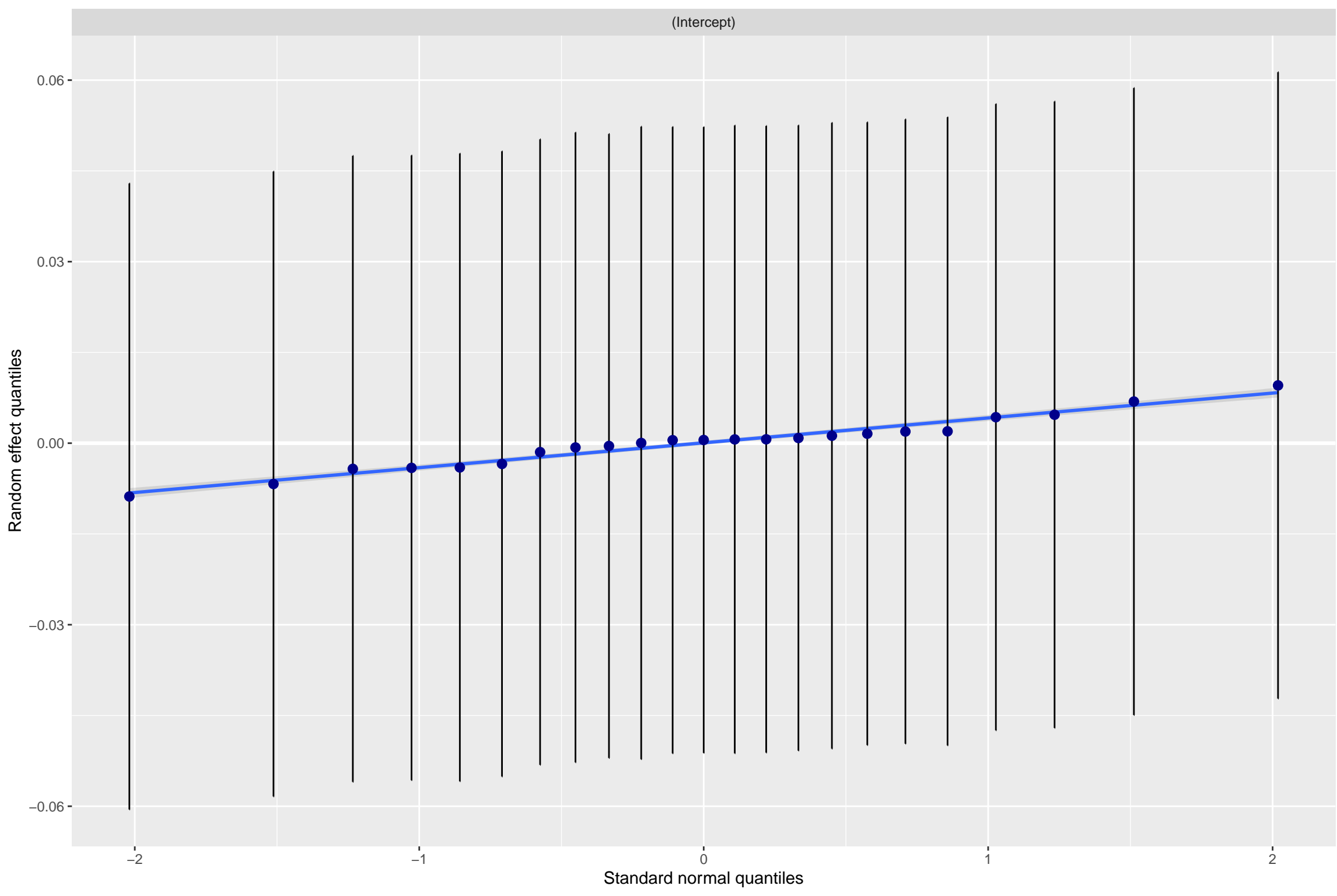
1

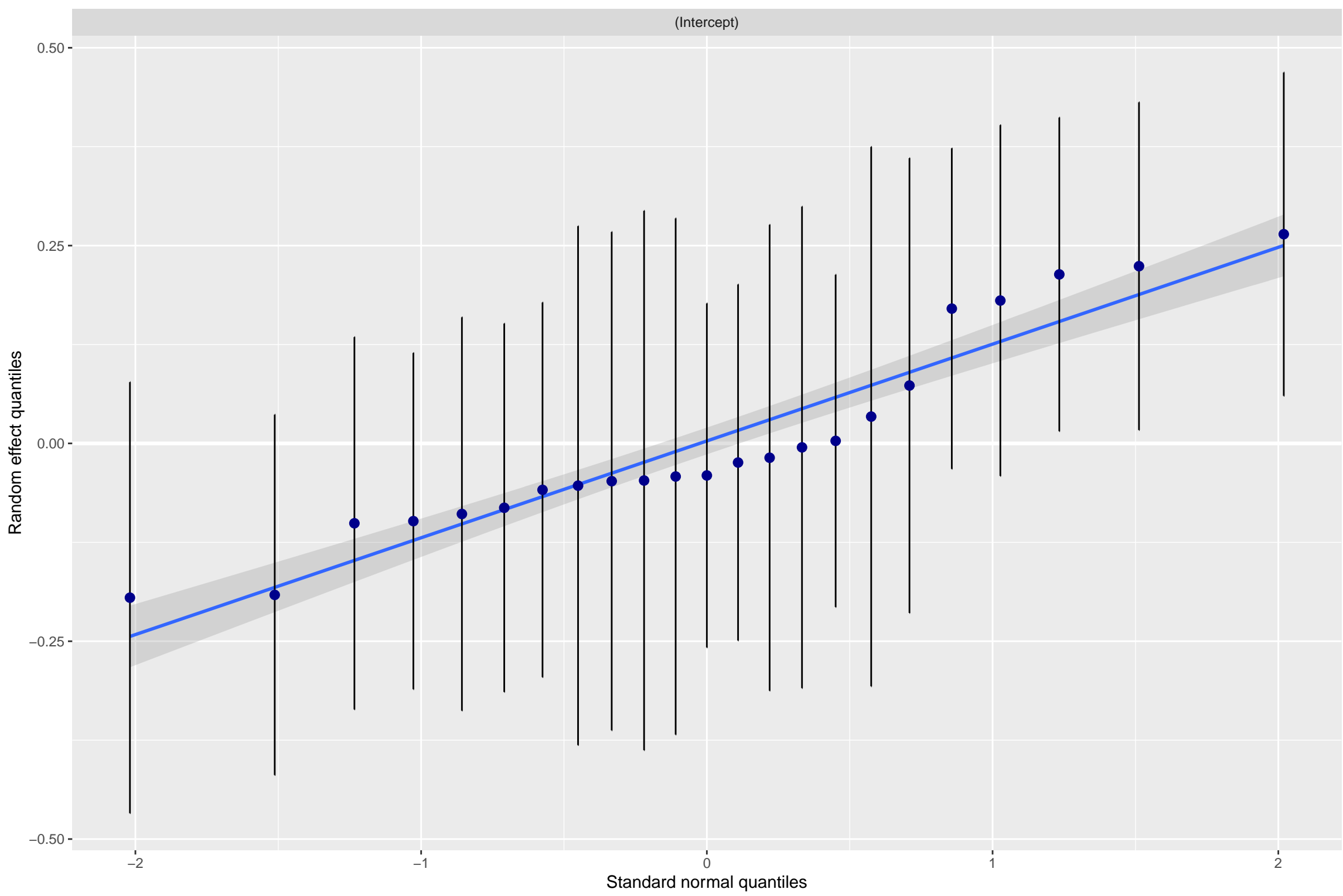
2

Standard normal quantiles









(Intercept)

Random effect quantiles

0.1

0.0

-0.1

-2

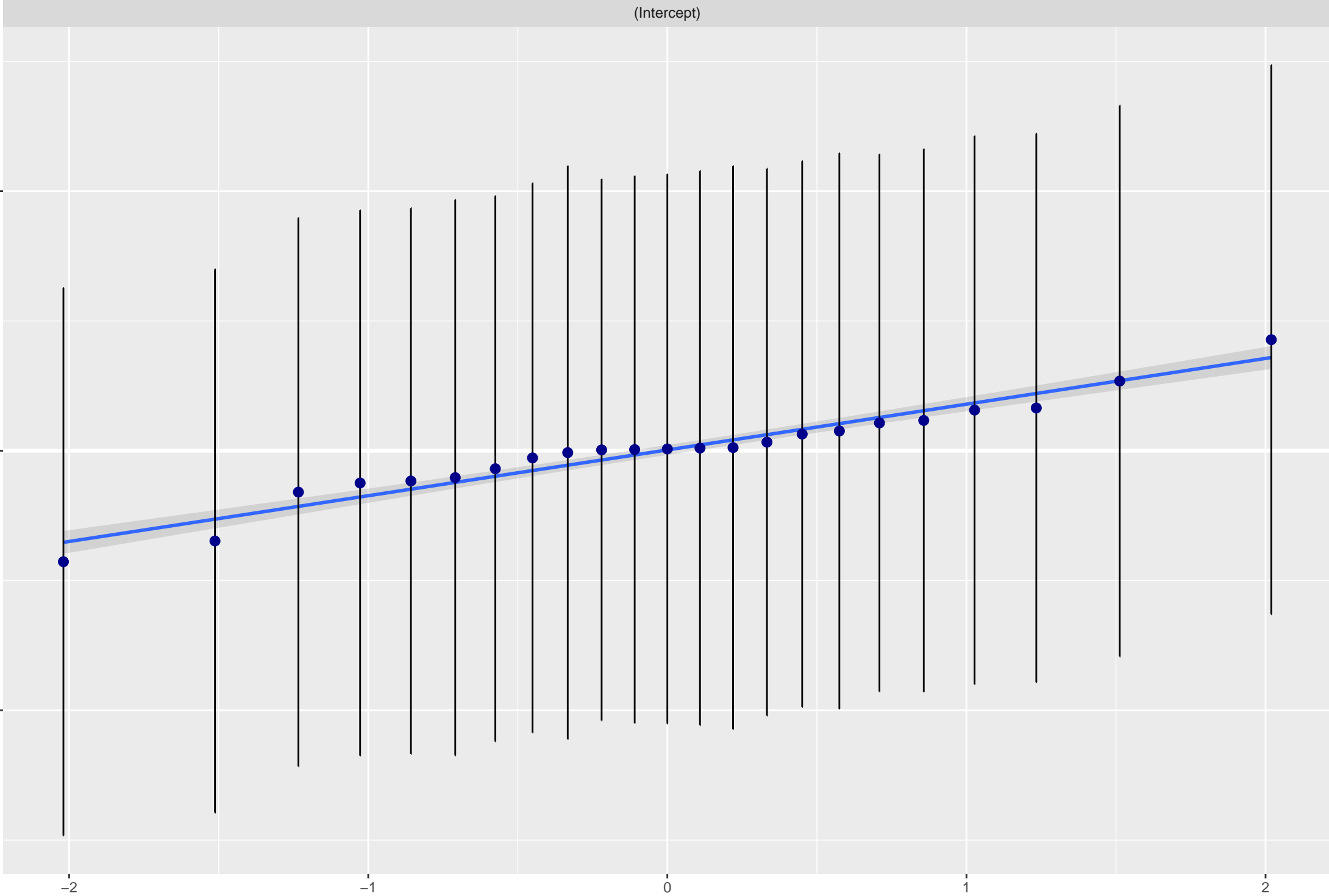
-1

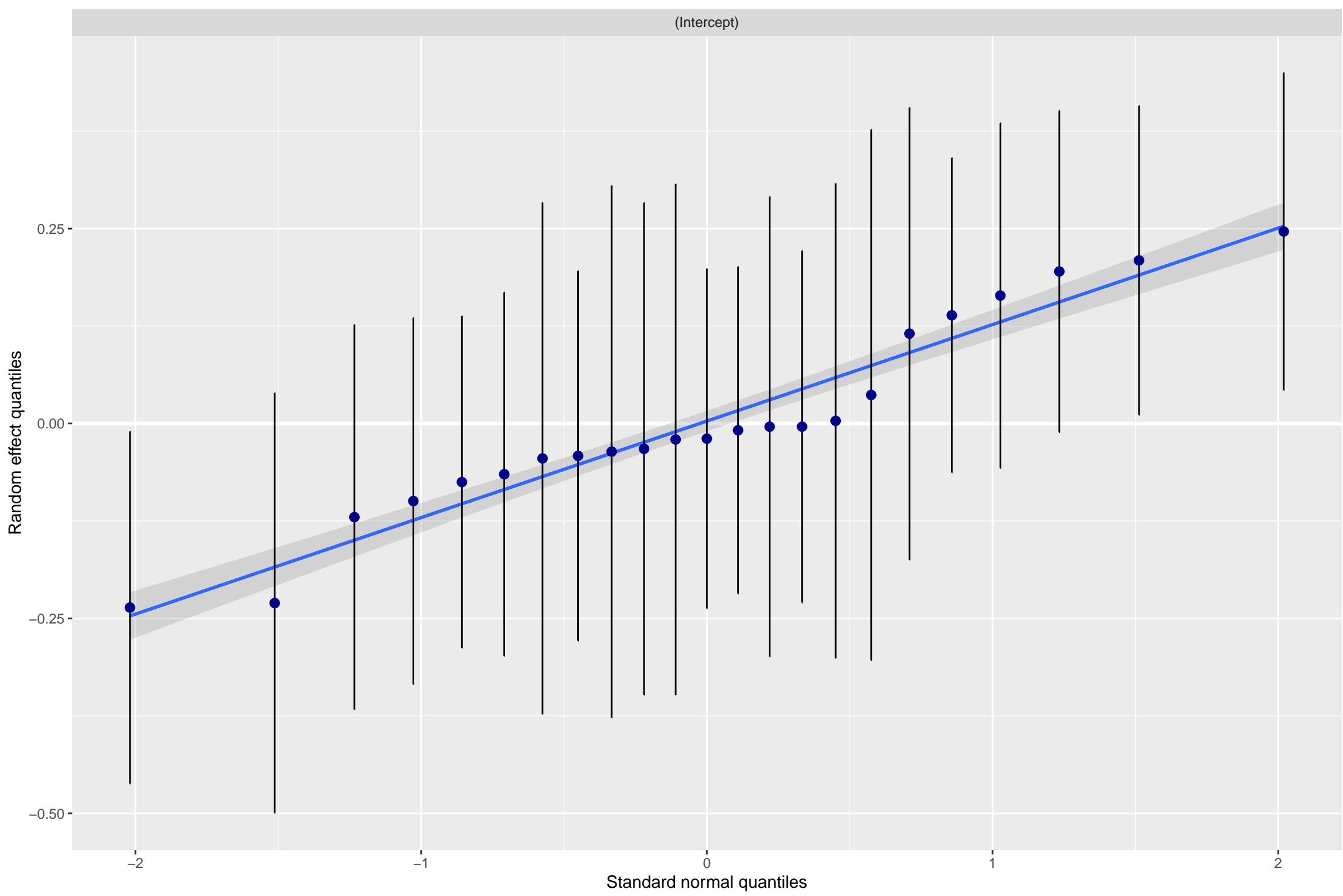
0

1

2

Standard normal quantiles





(Intercept)

Random effect quantiles

0.1

0.0

-0.1

-2

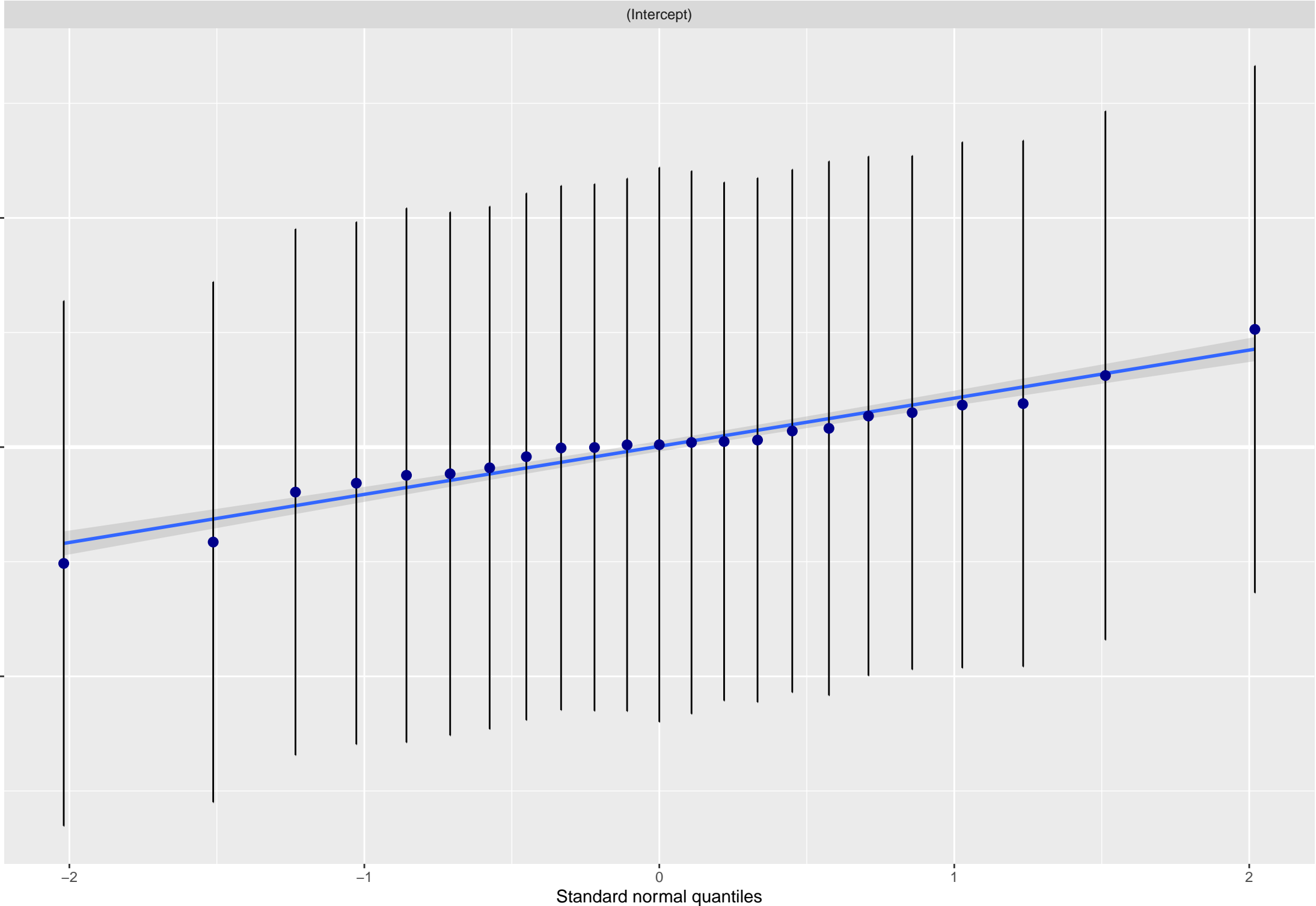
-1

0

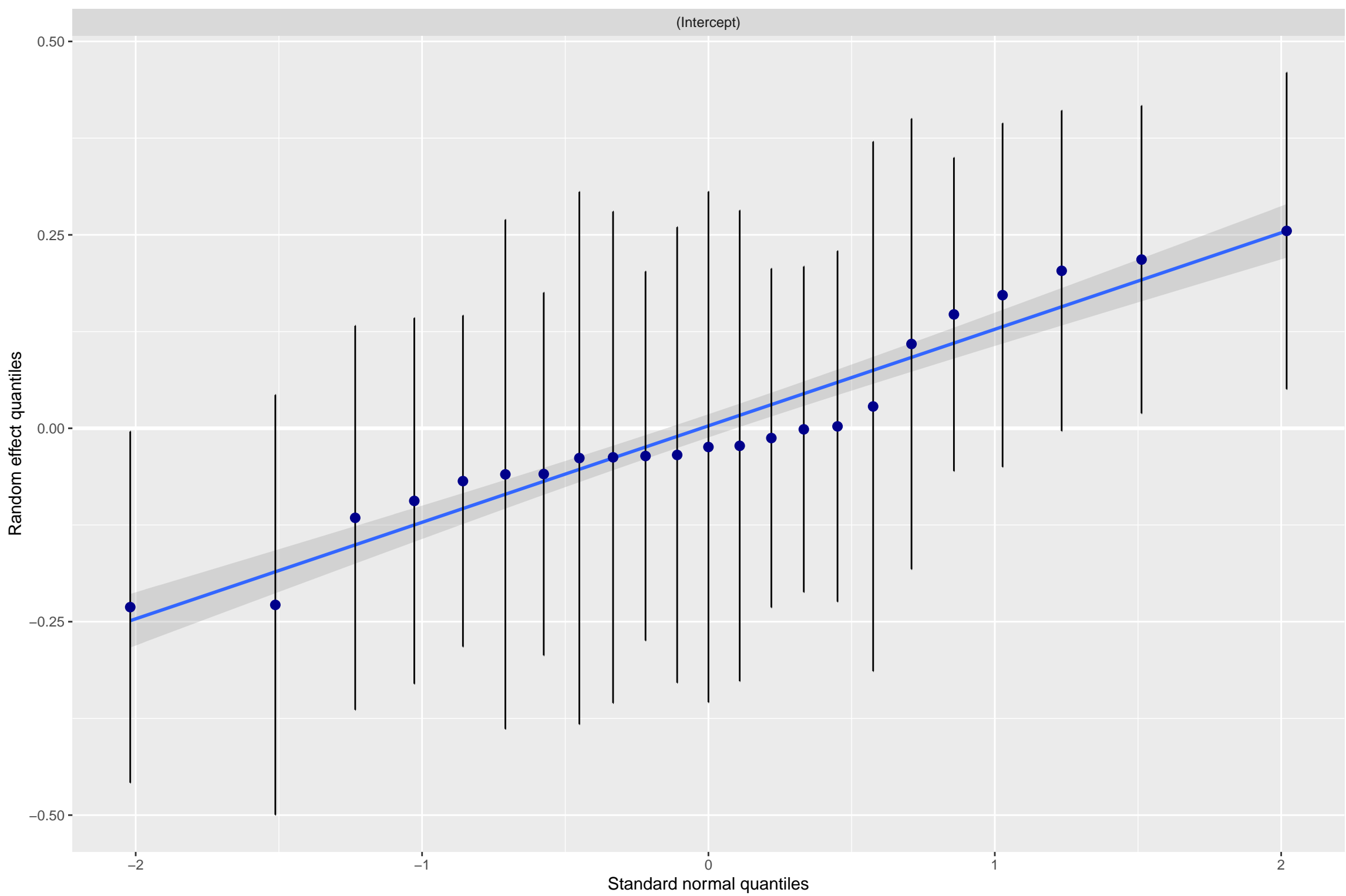
1

2

Standard normal quantiles







(Intercept)

Random effect quantiles

0.1

0.0

-0.1

-2

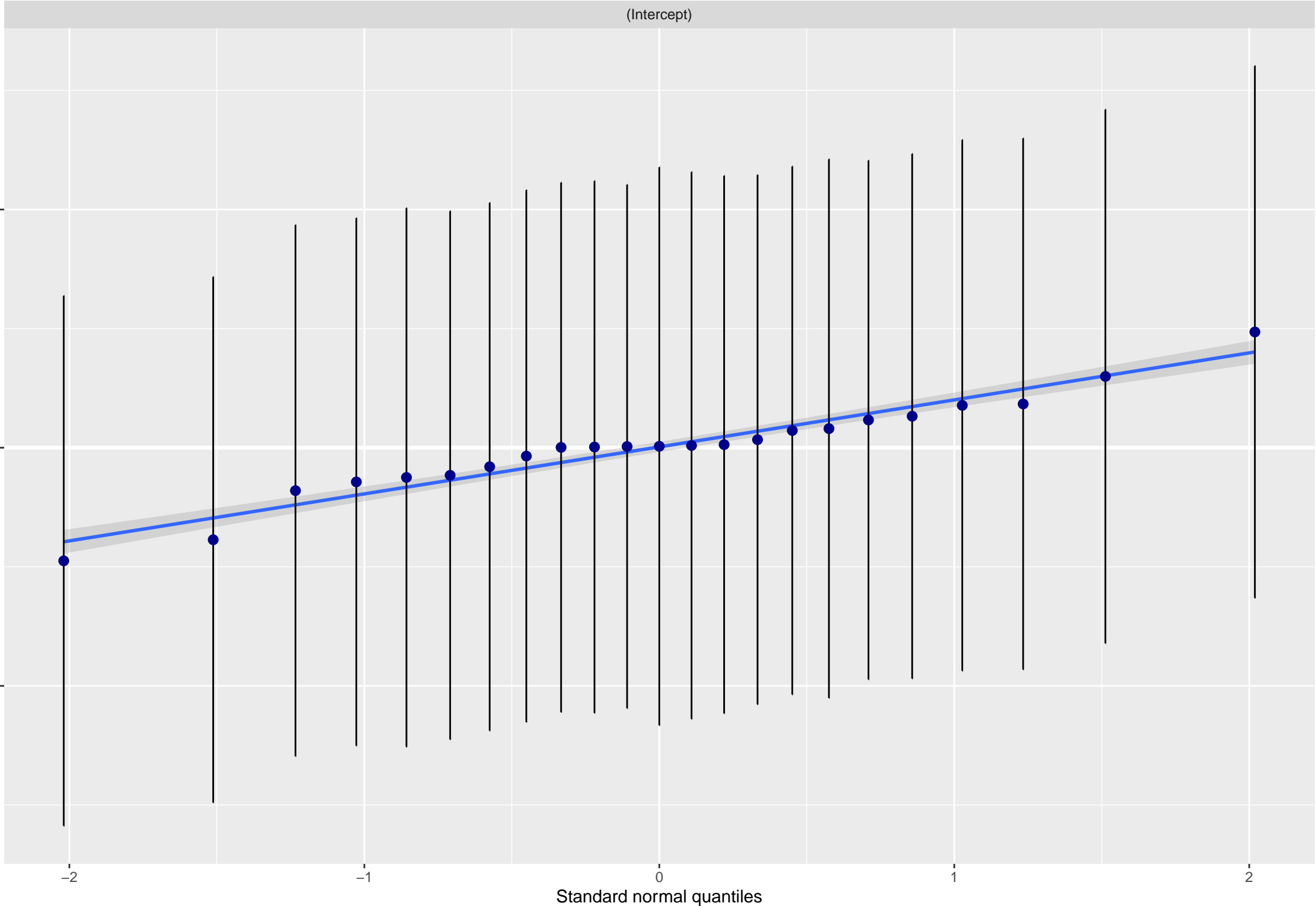
-1

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(15.2932) ( log )
Formula: no_species ~ (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
1134.1    1148.3    -563.1    1126.1      255

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.4726 -0.7396 -0.2241  0.5580  3.5145

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.033541 0.18314
Date_YMD (Intercept) 0.003309 0.05752
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  1.32727      0.05837   22.74 <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

$log_days_since_last_haul
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(15.2932) ( log )
Formula: no_species ~ 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
1134.8    1152.6    -562.4    1124.8      254

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.5758 -0.7379 -0.2129  0.5740  3.5168

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.036900 0.19209
Date_YMD (Intercept) 0.000714 0.02672
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  1.16075      0.15422   7.526 5.22e-14 ***
log_days_since_last_haul 0.07310      0.06198   1.179 0.238
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
lg_dys_sn_ -0.924

$depth_m
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(15.2932) ( log )
Formula: no_species ~ 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
1135.6    1153.4    -562.8    1125.6      254

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.4638 -0.7515 -0.2269  0.5452  3.5303

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.033236 0.18231
Date_YMD (Intercept) 0.003228 0.05681
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  1.201717      0.187726   6.401 1.54e-10 ***
depth_m      0.003538      0.004991   0.709 0.478
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
depth_m -0.951

$design
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(15.2932) ( log )
Formula: no_species ~ 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
1135.7    1153.4    -562.8    1125.7      254

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.4751 -0.7343 -0.2275  0.5552  3.4956

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.033047 0.1818
Date_YMD (Intercept) 0.003861 0.0623
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  1.2376      0.1461   8.470 <2e-16 ***
designZ      0.1059      0.1571   0.674 0.5
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
designZ -0.918

$location_exposure
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(15.2932) ( log )
Formula: no_species ~ 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
1136.0    1153.8    -563.0    1126.0      254

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.4736 -0.7367 -0.2310  0.5544  3.5065

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.033659 0.18347
Date_YMD (Intercept) 0.003639 0.06032
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)  1.33245      0.06030  22.095 <2e-16 ***
location_exposureWindward -0.07171      0.21408  -0.335 0.738
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
lctn_xperWn -0.249
```

# Full model summary

```
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(15.2932) ( log )
Formula: no_species ~ 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
1141.6    1173.6    -561.8    1123.6      250

Scaled residuals:
      Min       1Q   Median       3Q      Max
-1.5809 -0.7515 -0.2174  0.5609  3.5035

Random effects:
Groups Name Variance Std.Dev.
TrapID (Intercept) 0.0359209 0.1895
Date_YMD (Intercept) 0.0008293 0.0288
Number of obs: 259, groups: TrapID, 23; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    0.905006   0.310485   2.915  0.00356 **
designZ         0.129618   0.229857   0.564  0.57282
log_days_since_last_haul 0.082354   0.062865   1.310  0.19019
location_exposureWindward 0.016467   0.314744   0.052  0.95827
Exp_or_ContExperimental 0.013040   0.116395   0.112  0.91080
depth_m        0.003320   0.005562   0.597  0.55063
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) designZ lg_____ lctn_M Ex__CE
designZ    -0.550
lg_dys_n_____ -0.569  0.164
lctn_xpartn_____ -0.358  0.712  0.072
Exp_r_CntEx -0.305  0.051 -0.005  0.126
depth_m     -0.422 -0.337 -0.001 -0.346  0.105
```