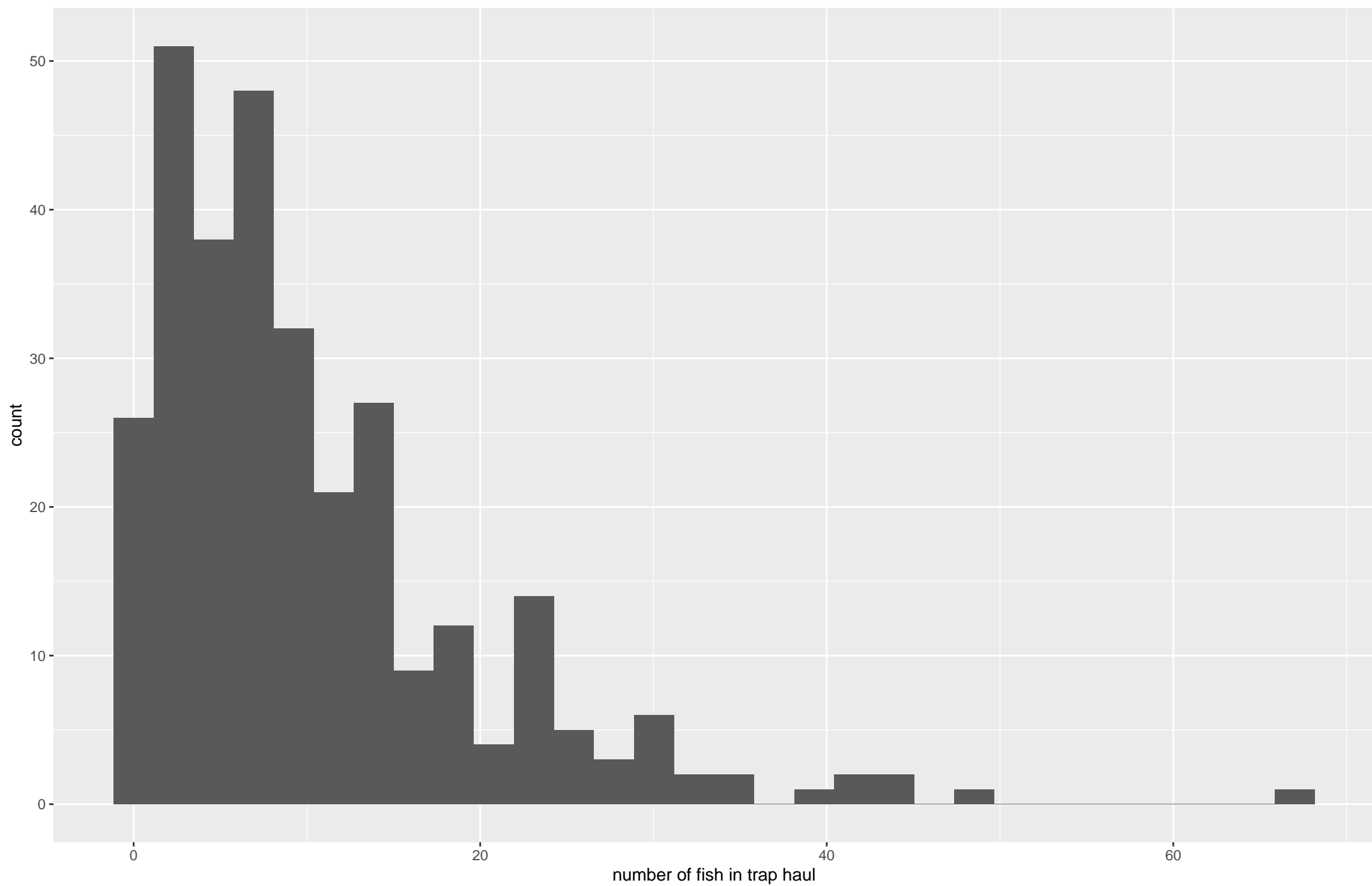
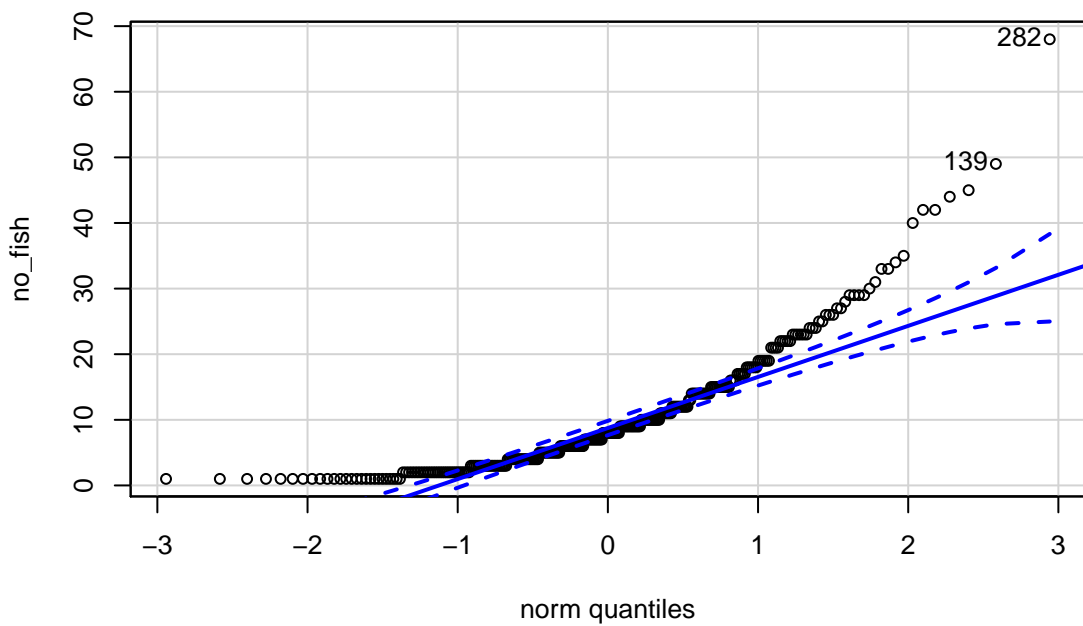


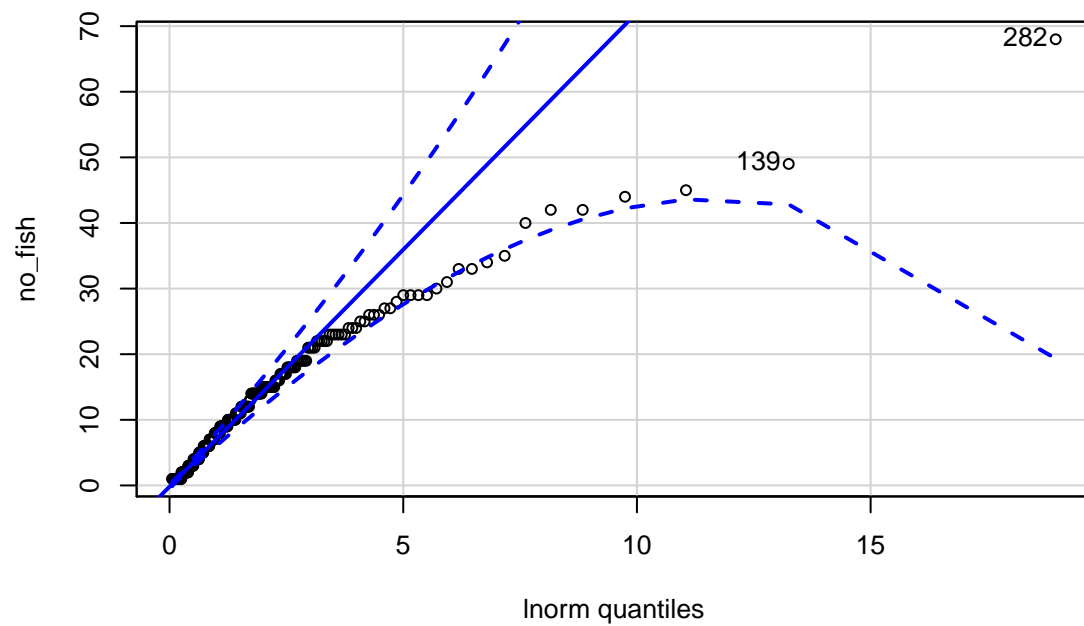
Histogram of number of fish



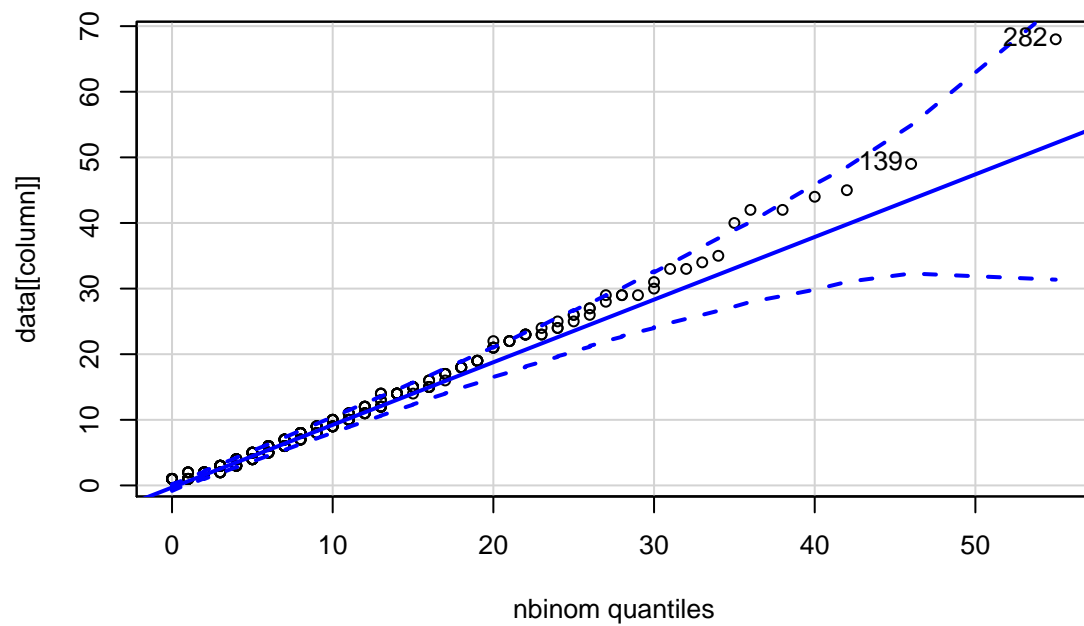
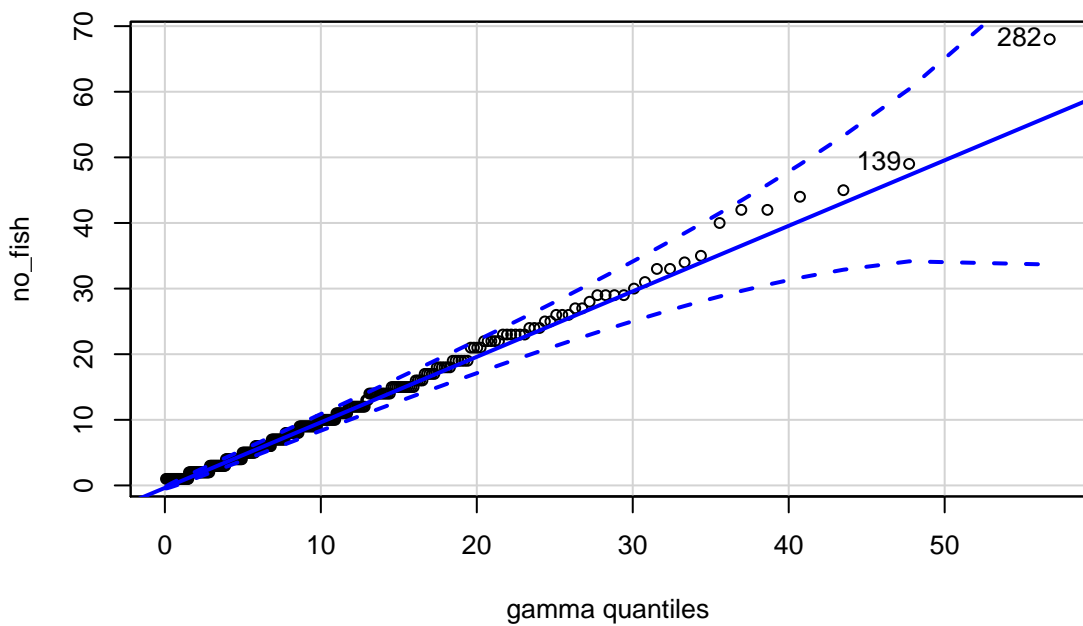
Normal distribution

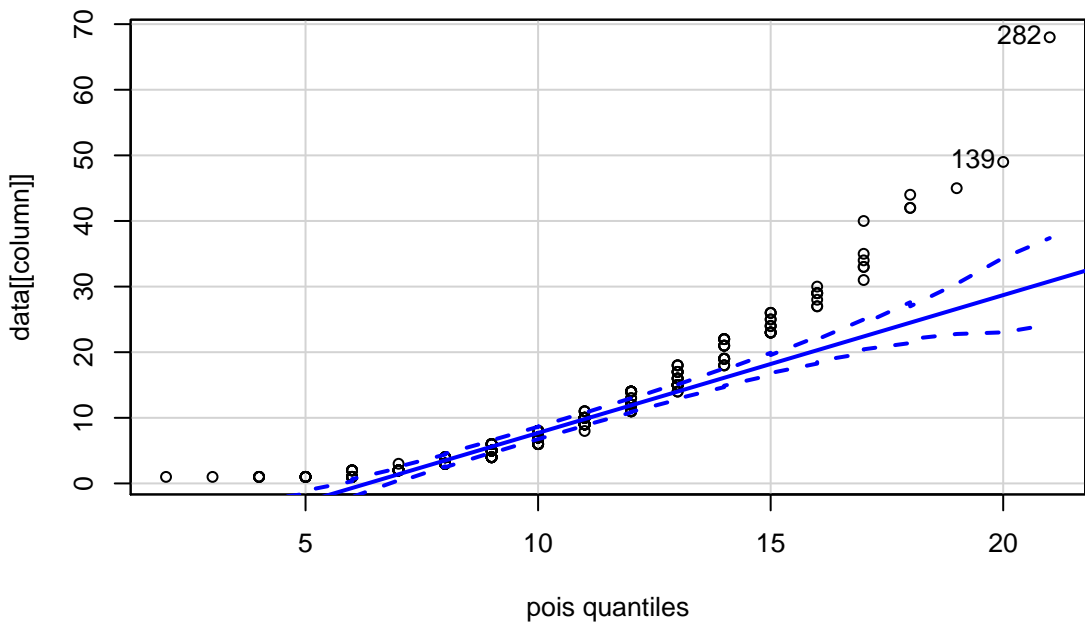


Log-normal distribution



Gamma distribution





```
Global model call: glmer(formula = no_fish ~ design + log_days_since_last_haul +
  location_exposure + Exp_or_Cont + (1 | TrapID) + (1 | Date_YMD),
  data = trap_haul_no_zero, family = MASS::negative.binomial(theta = 1.92820478299857),
  control = glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000)),
  na.action = "na.fail")
```

---

Model selection table

	(Int)	dsg	Exp_or_Cont	lct_exp	log_dys_snc_lst_hal	df	logLik	AICc	delta
5	2.291			+		5	-1020.054	2050.3	0.00
13	2.016			+	0.1214	6	-1019.435	2051.2	0.84
1	2.241					4	-1021.551	2051.2	0.93
6	2.402	+		+		6	-1019.813	2051.9	1.60
9	1.976				0.1165	5	-1021.004	2052.2	1.90
7	2.291		+	+		6	-1020.054	2052.4	2.08
14	2.118	+		+	0.1098	7	-1019.335	2053.0	2.74
2	2.193	+				5	-1021.465	2053.1	2.82
15	2.016		+	+	0.1212	7	-1019.435	2053.2	2.94
3	2.245		+			5	-1021.550	2053.3	2.99
10	1.867	+			0.1307	6	-1020.791	2053.9	3.55
8	2.403	+	+	+		7	-1019.813	2054.0	3.69
11	1.978		+		0.1169	6	-1021.003	2054.3	3.98
16	2.114	+	+	+	0.1105	8	-1019.335	2055.2	4.85
4	2.199	+	+			6	-1021.464	2055.2	4.90
12	1.873	+	+		0.1301	7	-1020.789	2056.0	5.64

weight

5	0.195
13	0.128
1	0.123
6	0.088
9	0.075
7	0.069
14	0.050
2	0.048
15	0.045
3	0.044
10	0.033
8	0.031
11	0.027
16	0.017
4	0.017
12	0.012

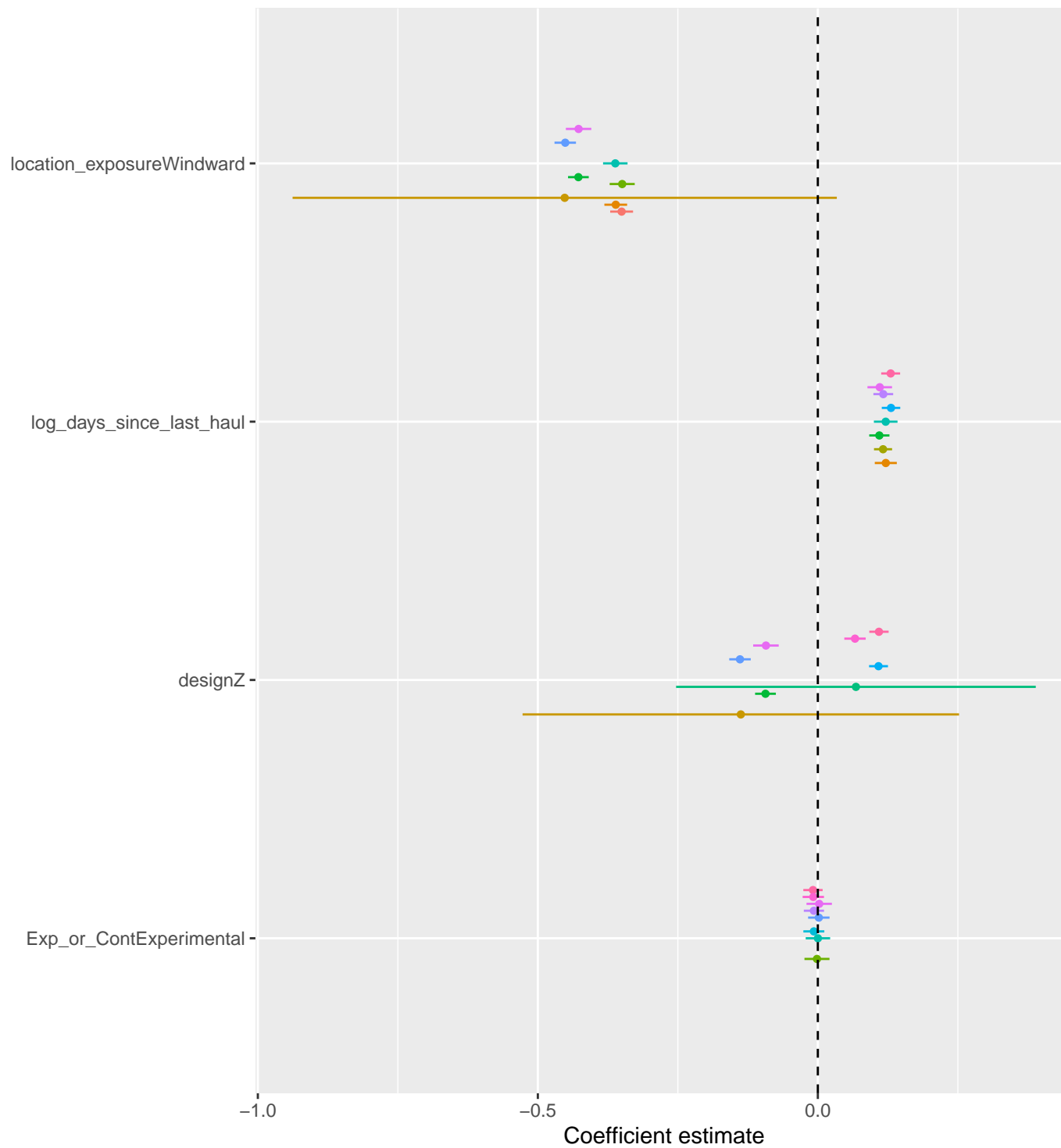
Models ranked by AICc(x)

Random terms (all models):

'1 | TrapID', '1 | Date\_YMD'

	<b>model</b>	<b>sigma</b>	<b>logLik</b>	<b>AIC</b>	<b>BIC</b>	<b>deviance</b>	<b>df.residual</b>
	location_exposure	1.00	-1020.05	2050.11	2068.74	297.61	302.00
	location_exposure + log_days_since_last_haul	1.00	-1019.44	2050.87	2073.23	296.75	301.00
	none	1.00	-1021.55	2051.10	2066.01	298.08	303.00
	design + location_exposure	1.00	-1019.81	2051.63	2073.99	296.96	301.00
	log_days_since_last_haul	1.00	-1021.00	2052.01	2070.64	297.07	302.00
	Exp_or_Cont + location_exposure	1.00	-1020.05	2052.11	2074.47	297.60	301.00
	design + location_exposure + log_days_since_last_haul	1.00	-1019.34	2052.67	2078.76	296.28	300.00
	design	1.00	-1021.47	2052.93	2071.56	298.21	302.00
	Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-1019.44	2052.87	2078.96	296.74	300.00
	Exp_or_Cont	1.00	-1021.55	2053.10	2071.73	298.08	302.00
	design + log_days_since_last_haul	1.00	-1020.79	2053.58	2075.94	297.70	301.00
	design + Exp_or_Cont + location_exposure	1.00	-1019.81	2053.63	2079.71	297.07	300.00
	Exp_or_Cont + log_days_since_last_haul	1.00	-1021.00	2054.01	2076.37	297.06	301.00
	design + Exp_or_Cont + location_exposure + log_days_since_last_haul	1.00	-1019.33	2054.67	2084.48	296.25	299.00
	design + Exp_or_Cont	1.00	-1021.46	2054.93	2077.29	298.33	301.00
	design + Exp_or_Cont + log_days_since_last_haul	1.00	-1020.79	2055.58	2081.67	297.69	300.00

# Predicting number of fish in trap haul



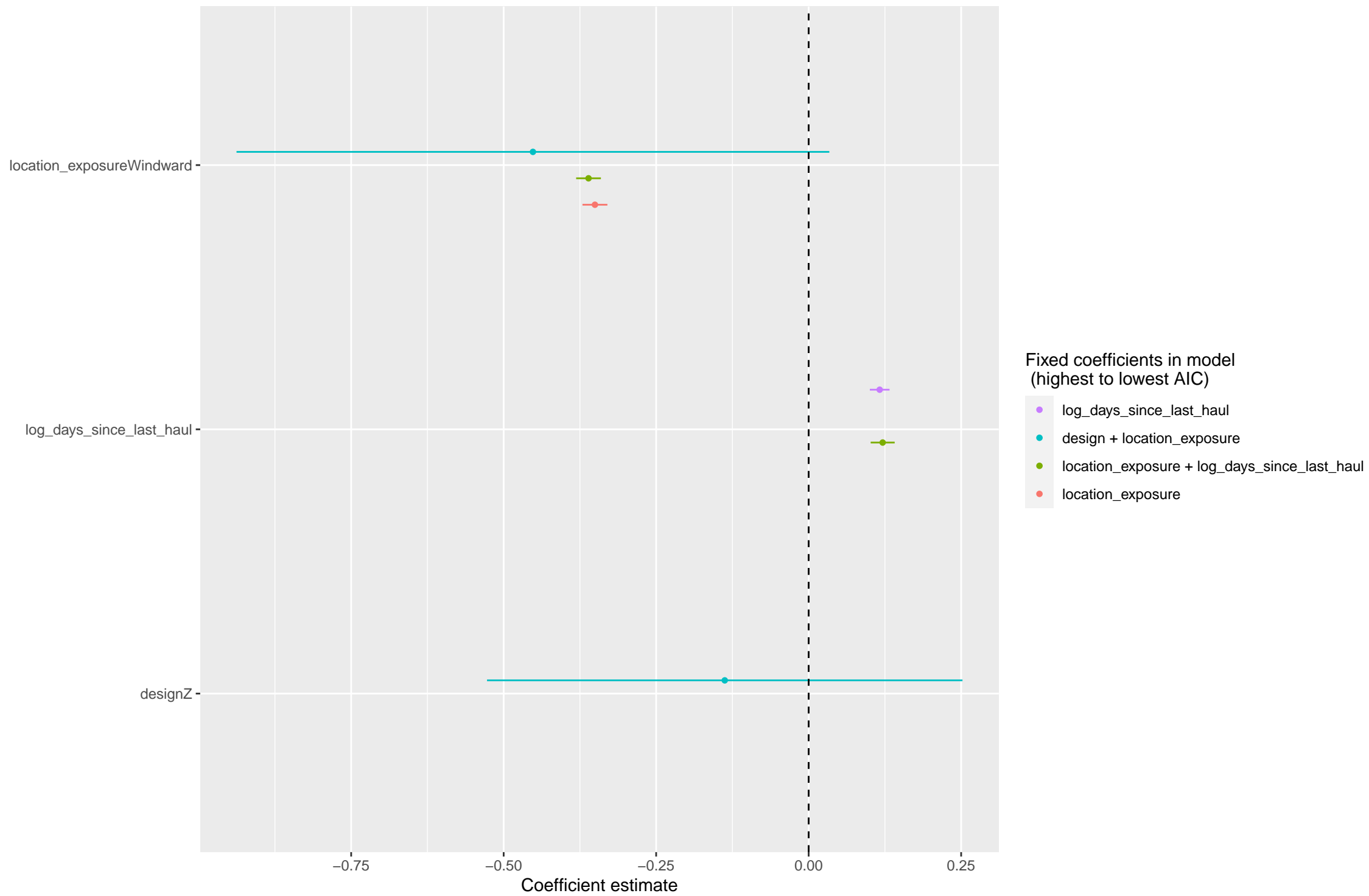
## Fixed coefficients in model (highest to lowest AIC)

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

### 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>
	location_exposure	1.00	−1020.05	2050.11	2068.74	297.61	302.00
location_exposure + log_days_since_last_haul		1.00	−1019.44	2050.87	2073.23	296.75	301.00
	none	1.00	−1021.55	2051.10	2066.01	298.08	303.00
design + location_exposure		1.00	−1019.81	2051.63	2073.99	296.96	301.00
	log_days_since_last_haul	1.00	−1021.00	2052.01	2070.64	297.07	302.00

Predicting number of fish in trap haul





(Intercept)

Random effect quantiles

0.4

0.0

-0.4

-2

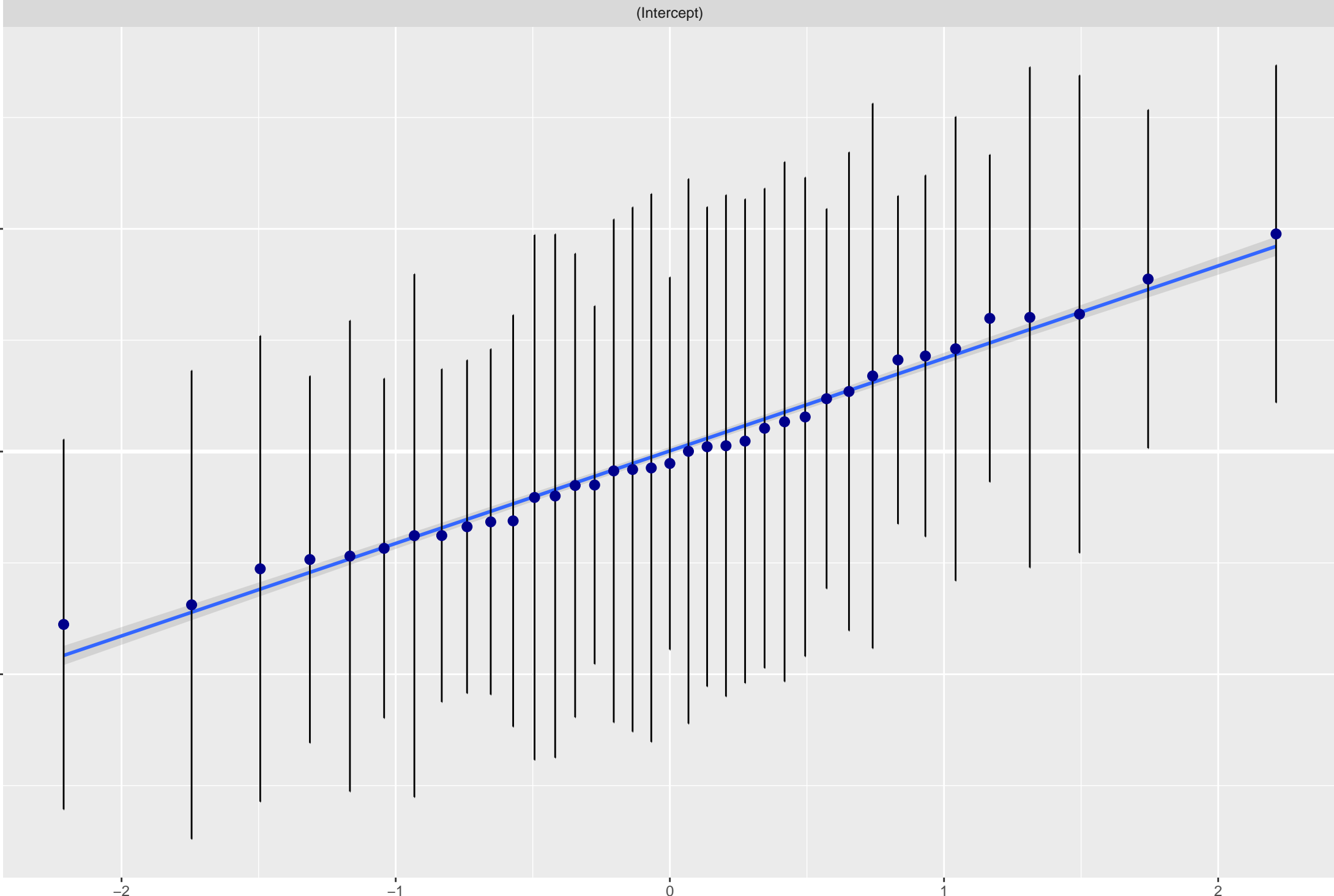
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.8

0.4

0.0

-0.4

-2

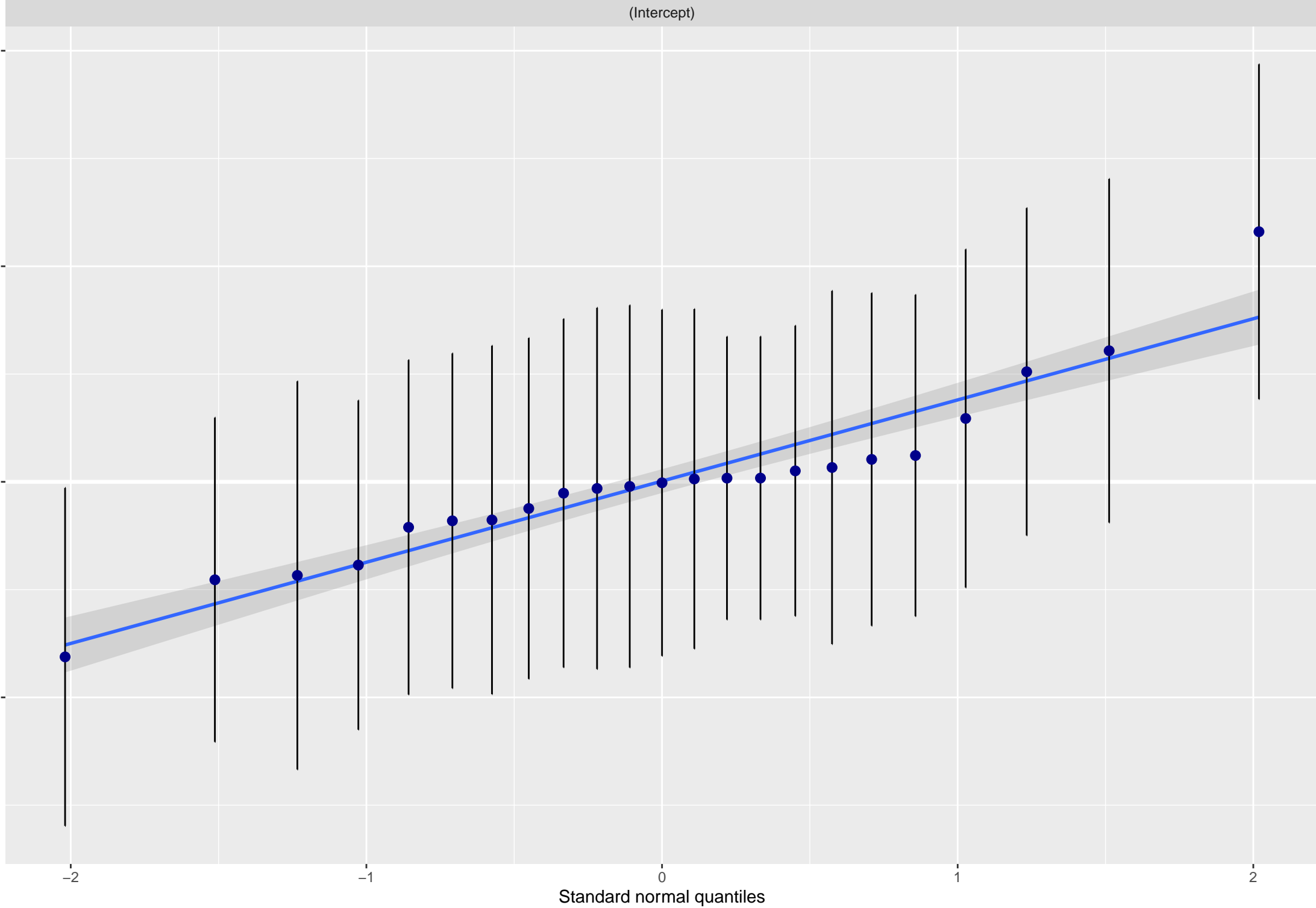
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.4

0.0

-0.4

-2

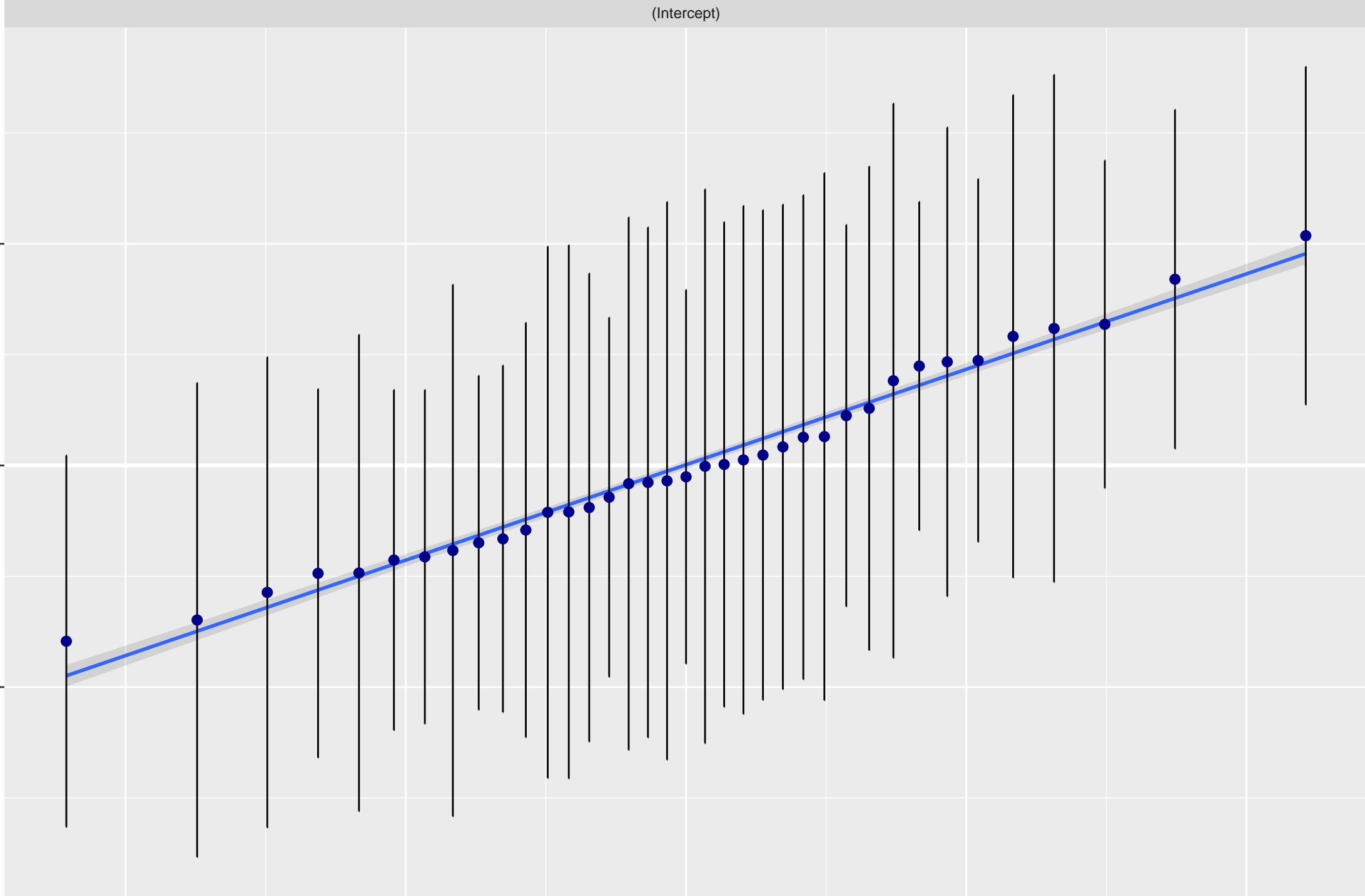
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.8  
0.4  
0.0  
-0.4

-2

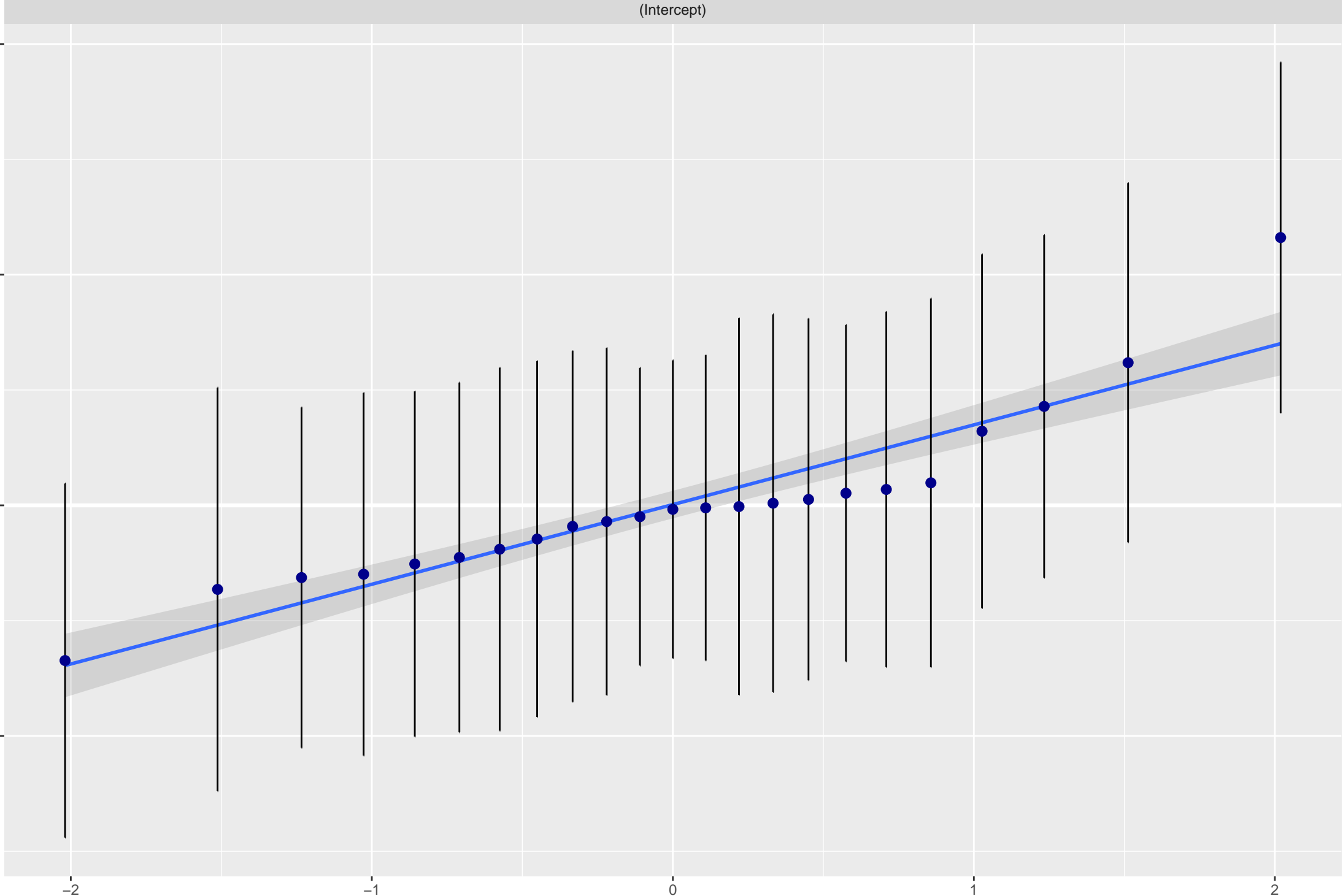
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

-2

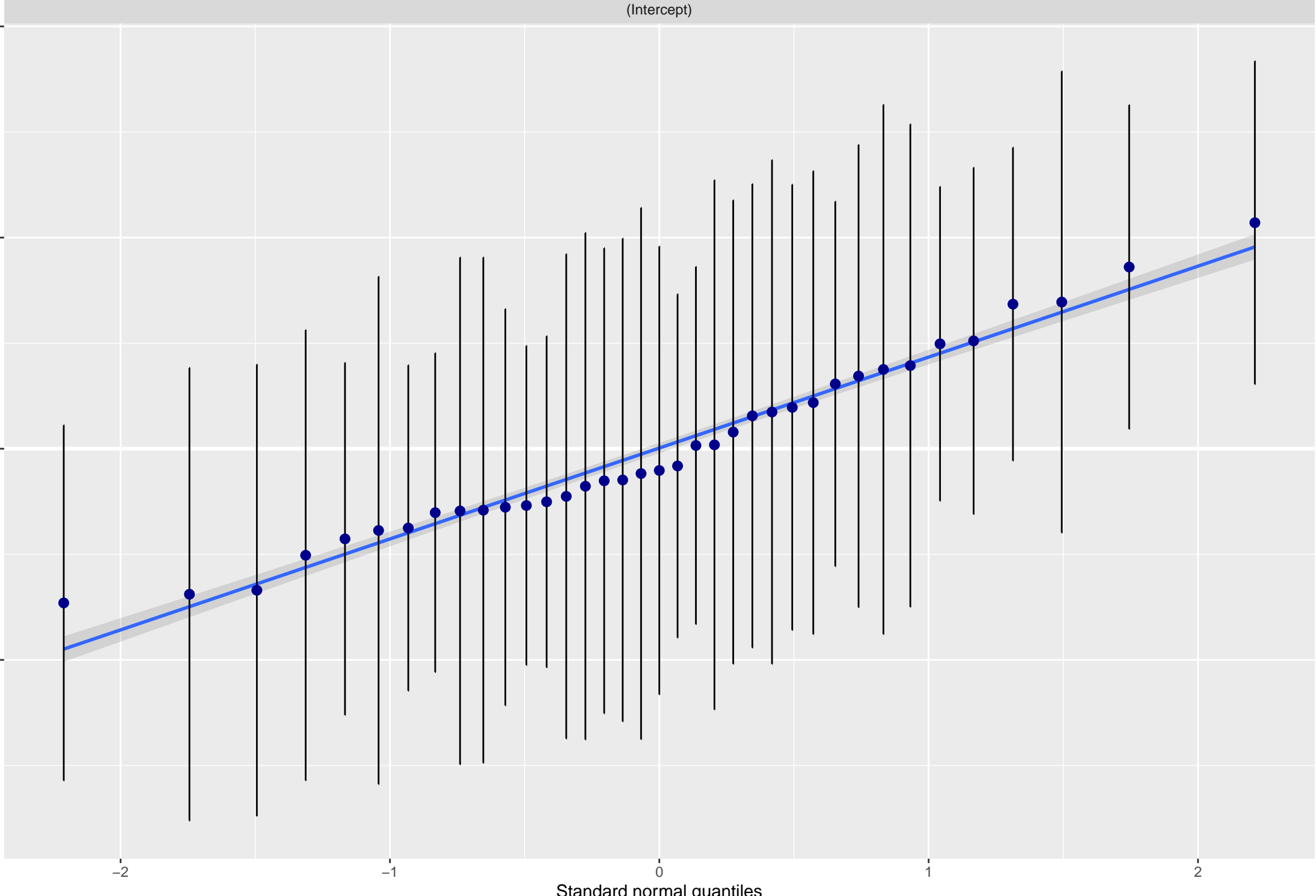
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.8

0.4

0.0

-0.4

-2

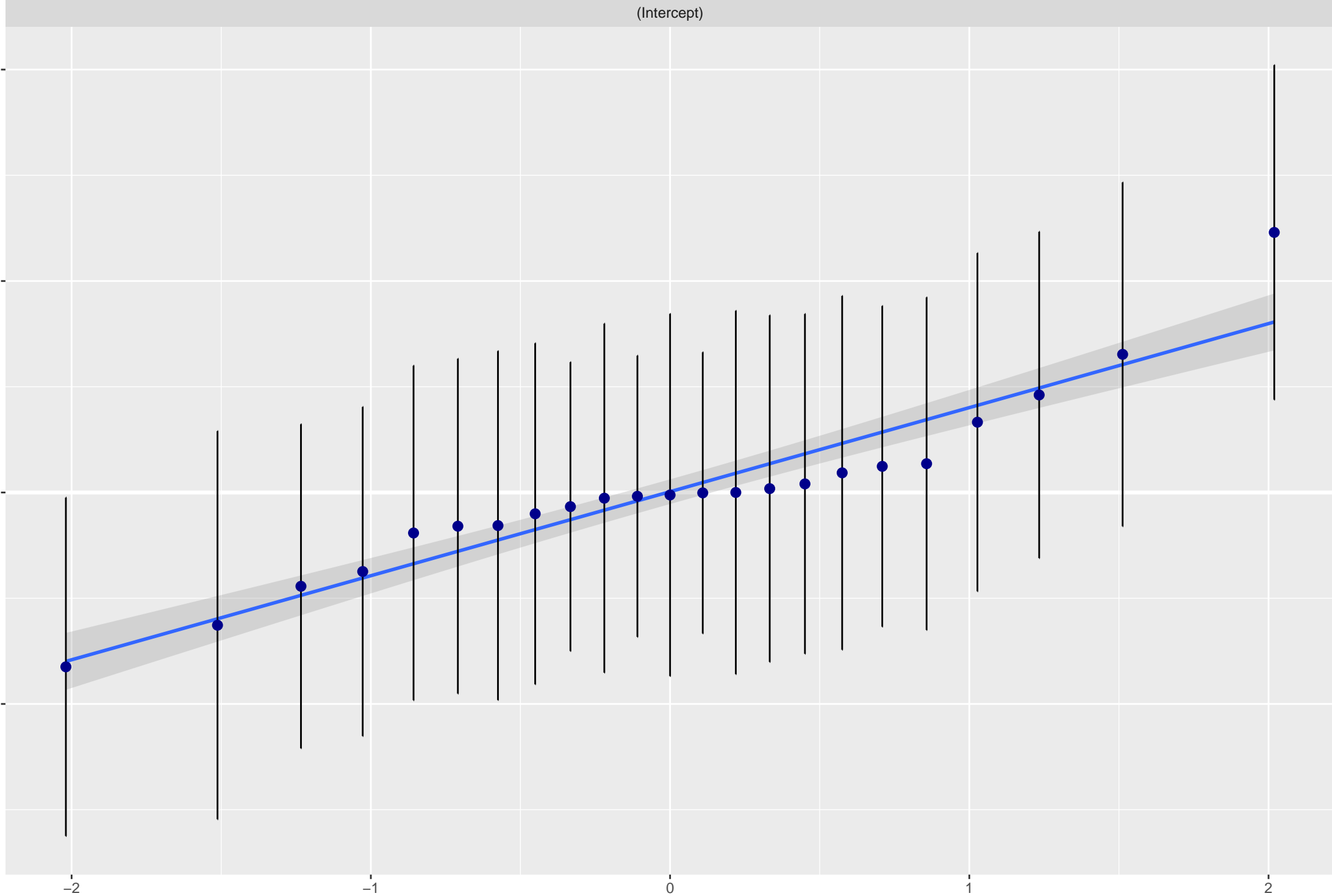
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

-2

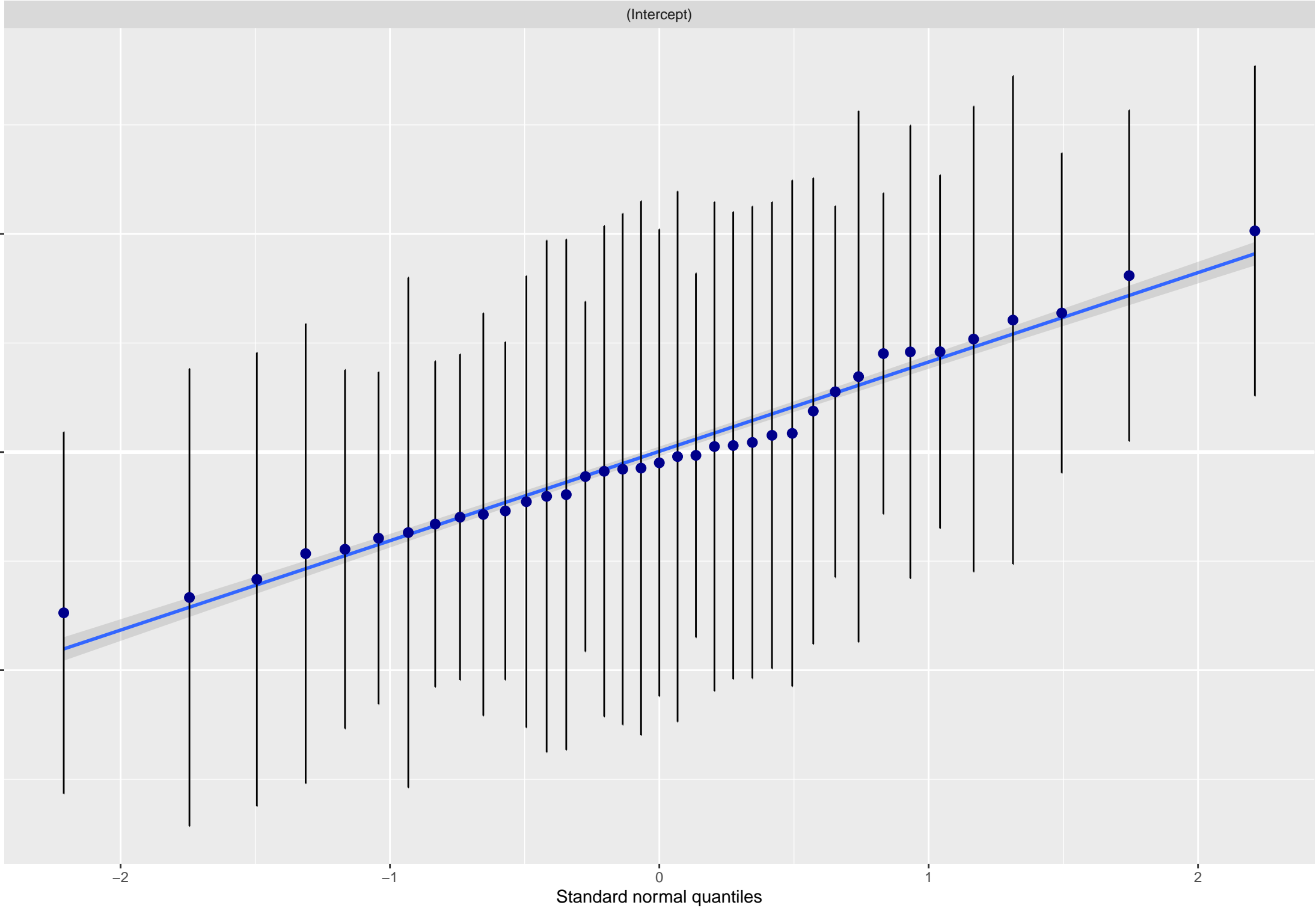
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.8

0.4

0.0

-0.4

-2

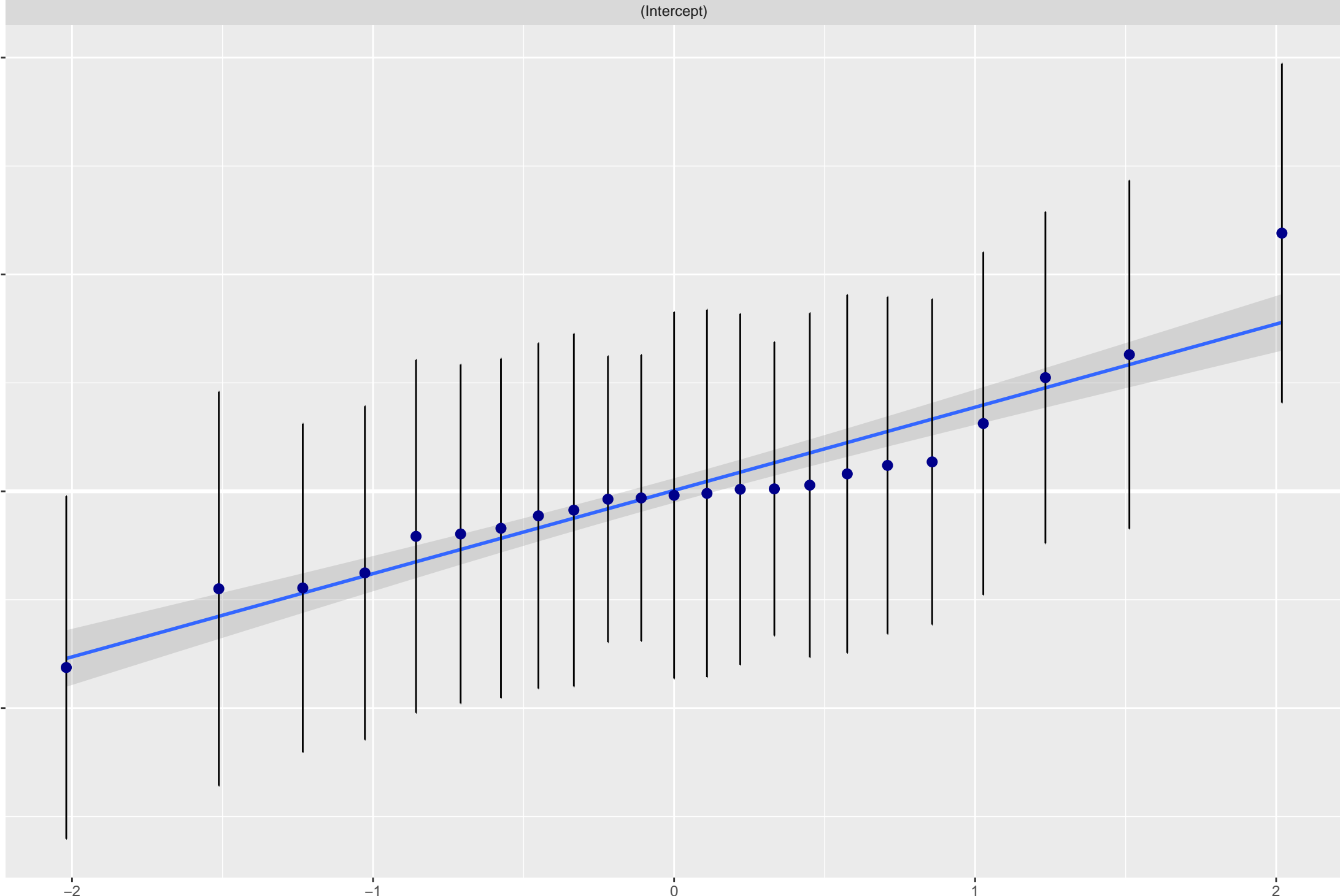
-1

0

1

2

Standard normal quantiles

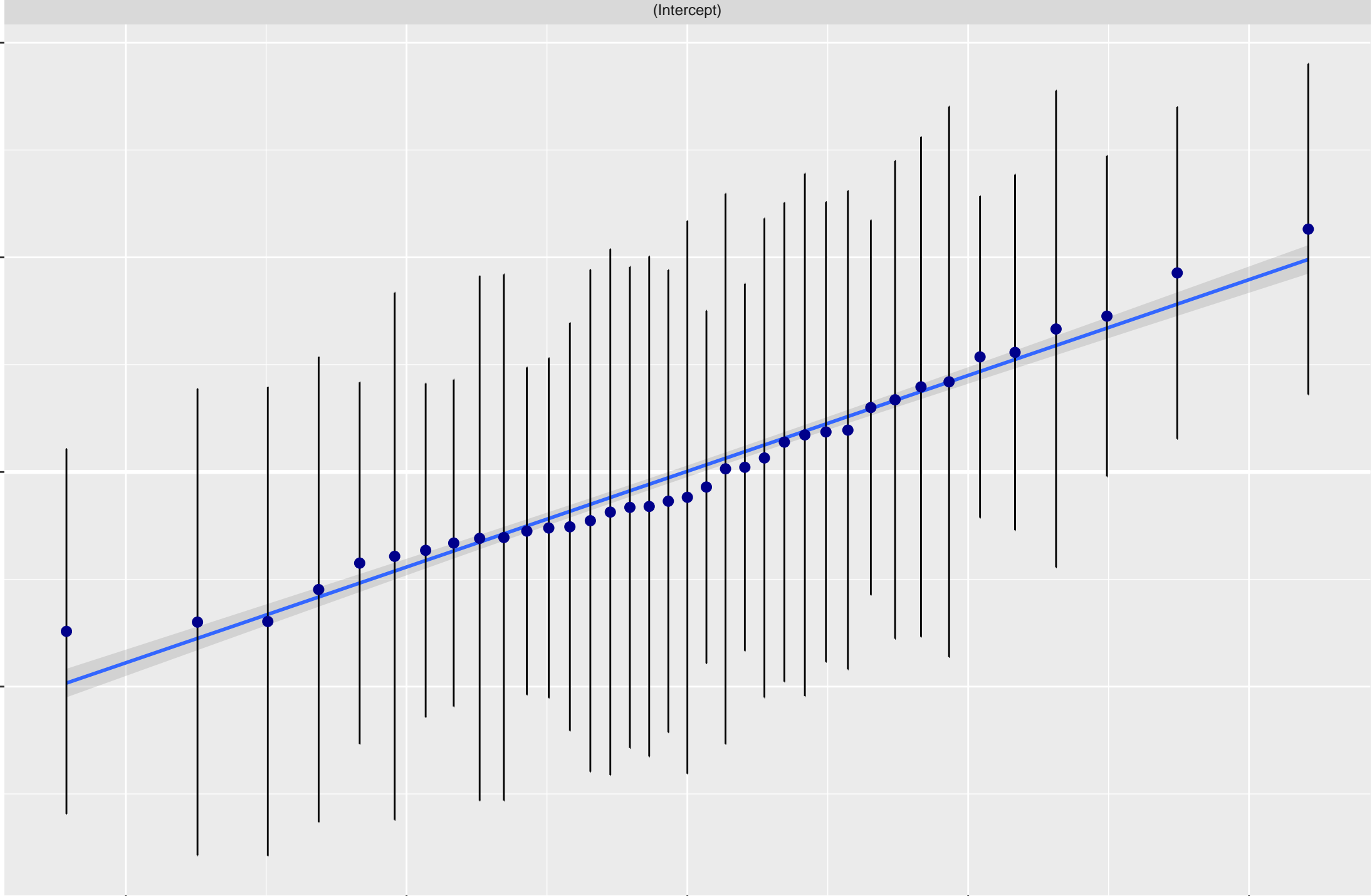




(Intercept)

Random effect quantiles

Standard normal quantiles



(Intercept)

Random effect quantiles

0.5

0.0

-0.5

-2

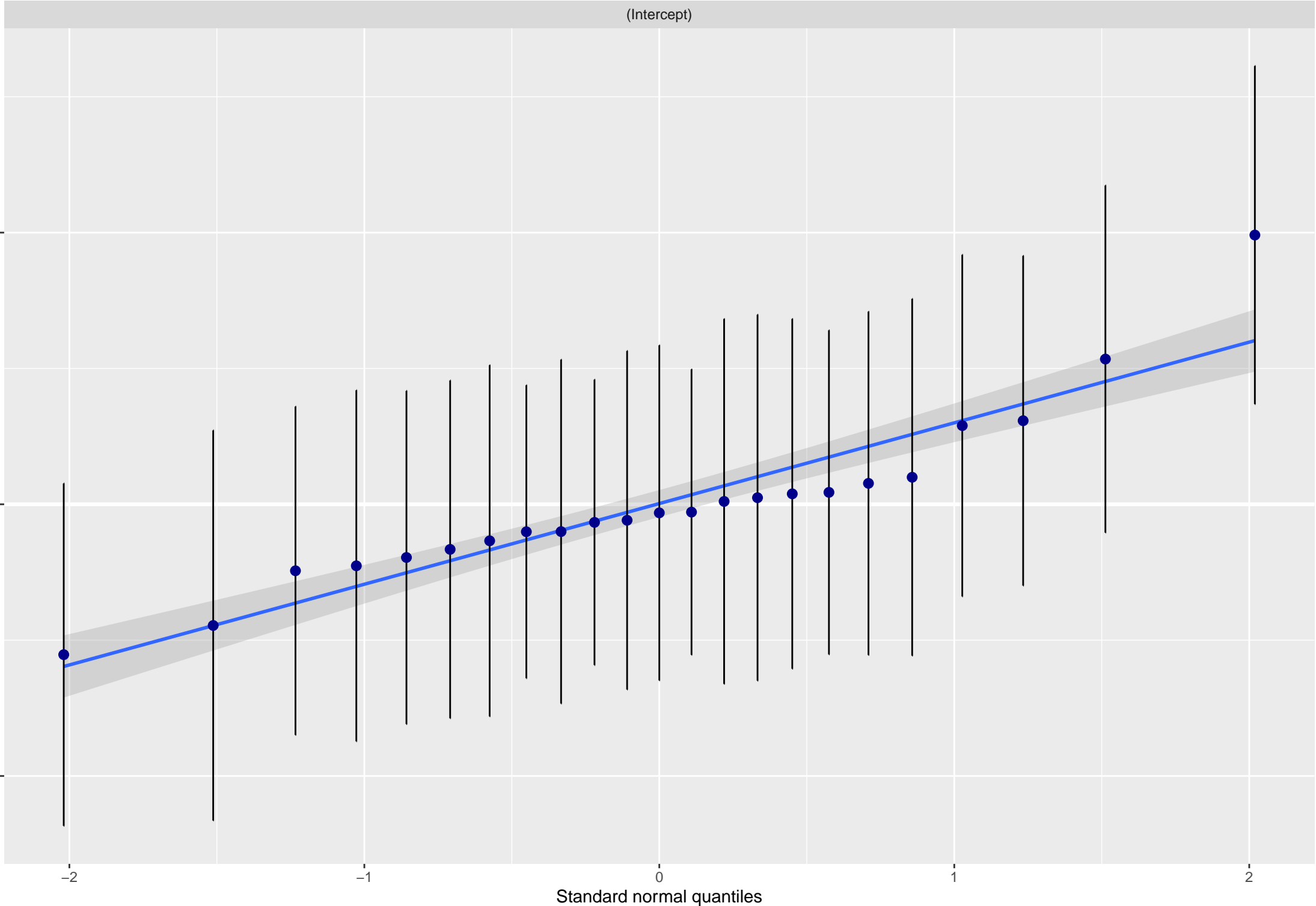
-1

0

1

2

Standard normal quantiles



# Model summaries for all models with delta AIC < 2

```
$location_exposure
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.9282) ( log )
Formula: no_fish ~ location_exposure + (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

          AIC      BIC   logLik deviance df.resid
2050.1    2068.7  -1020.1   2040.1      302

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.2030 -0.7875 -0.2457  0.5105  5.3783

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.06899 0.2627
Date_YMD (Intercept) 0.04924 0.2219
Number of obs: 307, groups: TrapID, 37; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    2.29088    0.01040  220.26  <2e-16 ***
location_exposureWindward -0.35039    0.01041  -33.65  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
lctn_xparWn -0.002
optimizer (bobyqa) convergence code: 0 (OK)
Model failed to converge with max|grad| = 0.00782697 (tol = 0.002, component 1)

$location_exposure + log_days_since_last_haul
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.9282) ( log )
Formula: no_fish ~ location_exposure + log_days_since_last_haul + (1 |
TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

          AIC      BIC   logLik deviance df.resid
2050.9    2073.2  -1019.4   2038.9      301

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.2014 -0.7770 -0.2407  0.4884  5.6068

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.07251 0.2693
Date_YMD (Intercept) 0.04506 0.2123
Number of obs: 307, groups: TrapID, 37; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    2.01586    0.01034  194.91  <2e-16 ***
location_exposureWindward -0.36088    0.01035  -34.86  <2e-16 ***
log_days_since_last_haul  0.12135    0.01004   12.09  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) lctn_W
lctn_xparWn -0.002
lg_dys_sn_ -0.029 -0.005
optimizer (bobyqa) convergence code: 0 (OK)
Model failed to converge with max|grad| = 0.00687771 (tol = 0.002, component 1)

$none
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.9282) ( log )
Formula: no_fish ~ (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

          AIC      BIC   logLik deviance df.resid
2051.1    2066.0  -1021.6   2043.1      303

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.2044 -0.7737 -0.2366  0.5637  5.3660

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.07287 0.2699
Date_YMD (Intercept) 0.05297 0.2301
Number of obs: 307, groups: TrapID, 37; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    2.241378    0.009213   243.3  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
optimizer (bobyqa) convergence code: 0 (OK)
Model failed to converge with max|grad| = 0.00772819 (tol = 0.002, component 1)
```

```
$design + location_exposure
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.9282) ( log )
Formula: no_fish ~ design + location_exposure + (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

          AIC      BIC   logLik deviance df.resid
2051.6    2074.0  -1019.8   2039.6      301

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.2037 -0.7841 -0.2428  0.5266  5.3685

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.06821 0.2612
Date_YMD (Intercept) 0.05058 0.2249
Number of obs: 307, groups: TrapID, 37; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    2.4020    0.1845   13.022  <2e-16 ***
designZ         -0.1376    0.1988  -0.692   0.4891
location_exposureWindward -0.4520    0.2479  -1.823   0.0683 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr) designZ
designZ      -0.873
lctn_xparWn -0.630 0.585

$log_days_since_last_haul
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.9282) ( log )
Formula: no_fish ~ log_days_since_last_haul + (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

          AIC      BIC   logLik deviance df.resid
2052.0    2070.6  -1021.0   2042.0      302

Scaled residuals:
   Min       1Q   Median       3Q      Max
-1.1998 -0.7825 -0.2367  0.5299  5.5683

Random effects:
 Groups Name Variance Std.Dev.
TrapID (Intercept) 0.07660 0.2768
Date_YMD (Intercept) 0.04932 0.2221
Number of obs: 307, groups: TrapID, 37; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)    1.975528    0.008393  235.38  <2e-16 ***
log_days_since_last_haul 0.116456    0.008238   14.14  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
      (Intr)
lg_dys_sn_ -0.017
optimizer (bobyqa) convergence code: 0 (OK)
Model failed to converge with max|grad| = 0.00894953 (tol = 0.002, component 1)
```

# Full model summary

```
Generalized linear mixed model fit by maximum likelihood (Laplace
Approximation) [glmerMod]
Family: Negative Binomial(1.9282) ( log )
Formula: no_fish ~ design + log_days_since_last_haul + location_exposure +
  Exp_or_Cont + (1 | TrapID) + (1 | Date_YMD)
Data: trap_haul_no_zero
Control: glmerControl(optimizer = "bobyqa", optCtrl = list(maxfun = 10000))

          AIC          BIC    logLik deviance df.resid
2054.7      2084.5     -1019.3   2038.7      299

Scaled residuals:
    Min       1Q   Median       3Q      Max
-1.1997 -0.7792 -0.2421  0.4987  5.5664

Random effects:
Groups   Name              Variance Std.Dev.
TrapID   (Intercept)  0.07200  0.2683
Date_YMD (Intercept)  0.04676  0.2162
Number of obs: 307, groups:  TrapID, 37; Date_YMD, 23

Fixed effects:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)      2.110002    0.353856   5.963 2.48e-09 ***
designZ            -0.092330    0.206267   -0.448   0.654
log_days_since_last_haul  0.111962    0.113652   0.985   0.325
location_exposureWindward -0.429229    0.250829   -1.711   0.087 .
Exp_or_ContExperimental  0.002631    0.139090   0.019   0.985
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Correlation of Fixed Effects:
          (Intr) designZ lg_____ lctn_W
designZ      -0.620
lg_dys_sn__ -0.831  0.216
lctn_xperWm -0.399  0.590  0.093
Exp_r_CntEx -0.183 -0.038 -0.005 -0.043
```