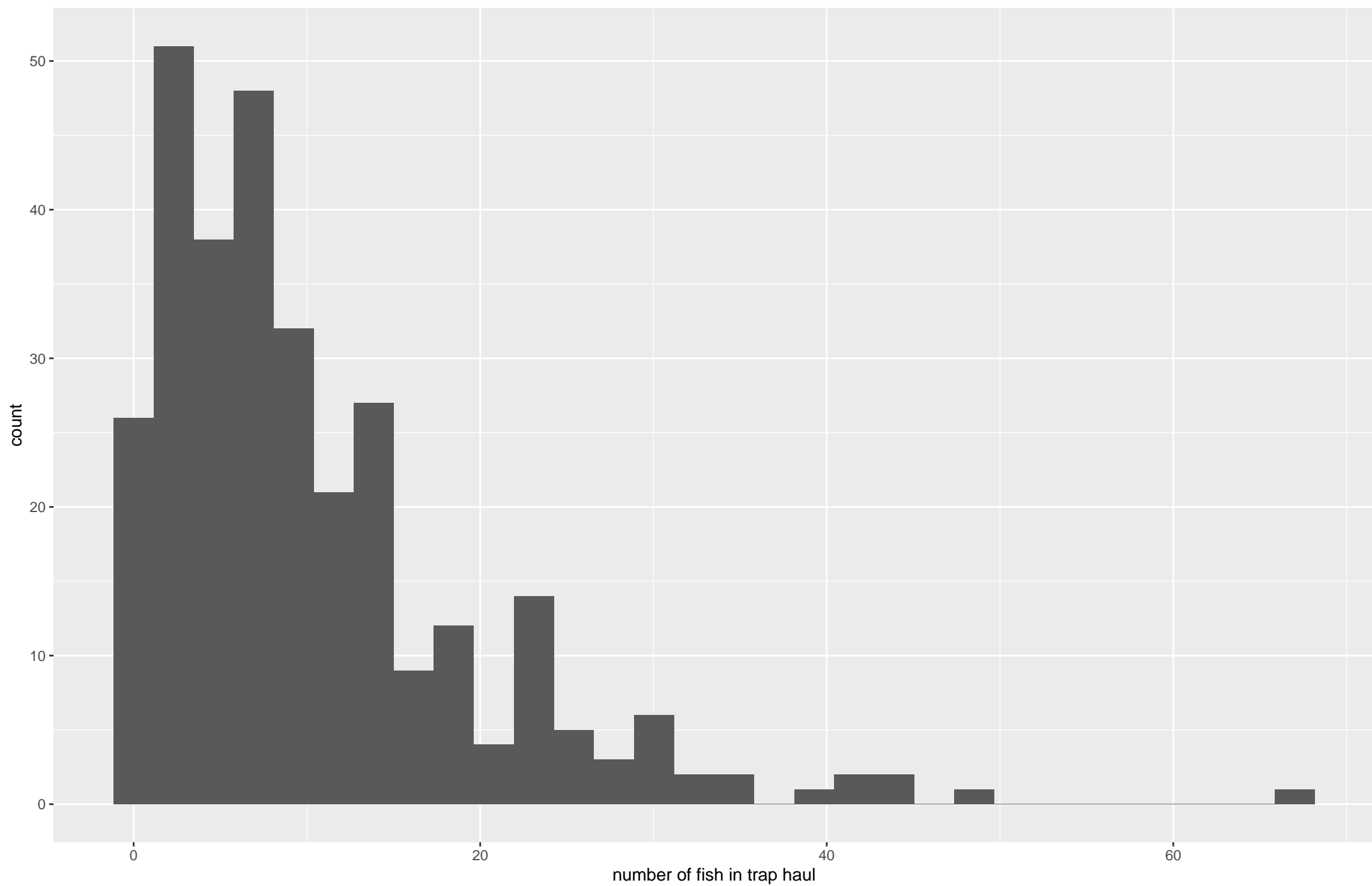
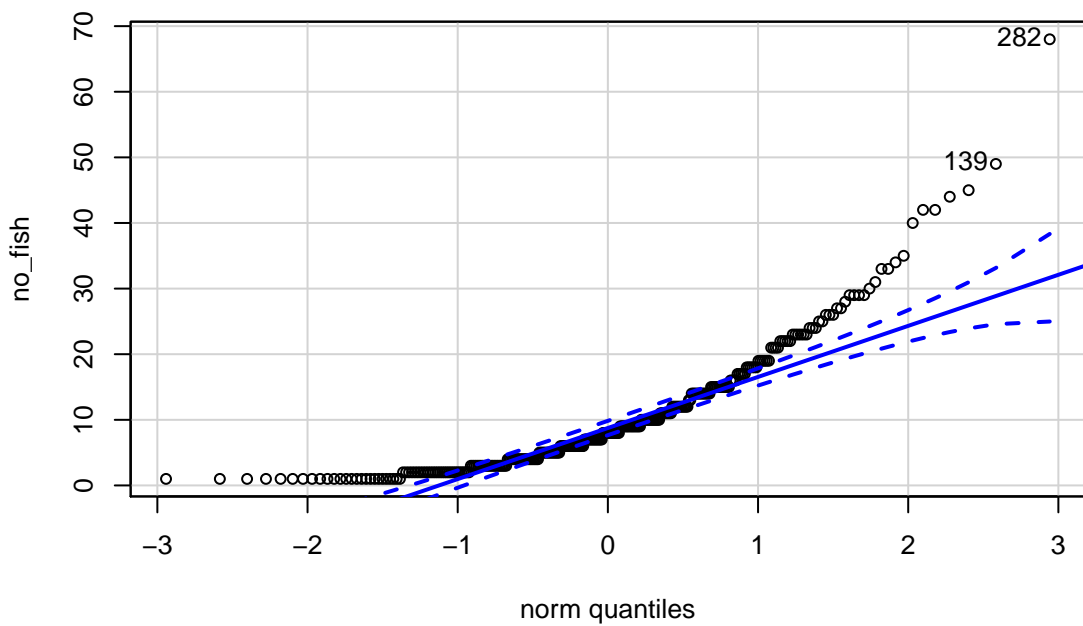


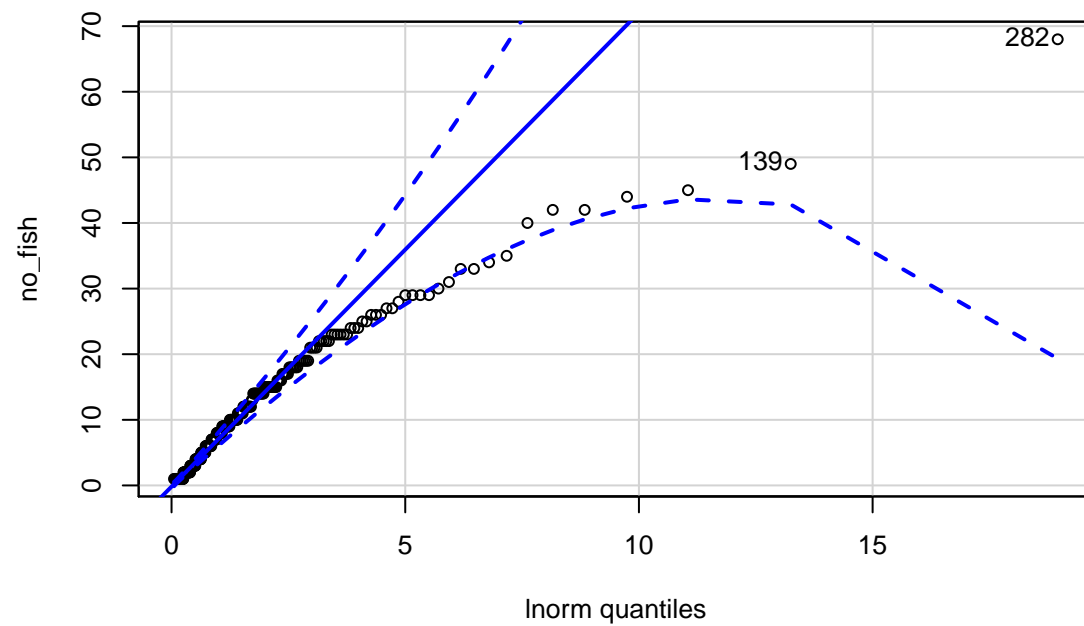
Histogram of number of fish



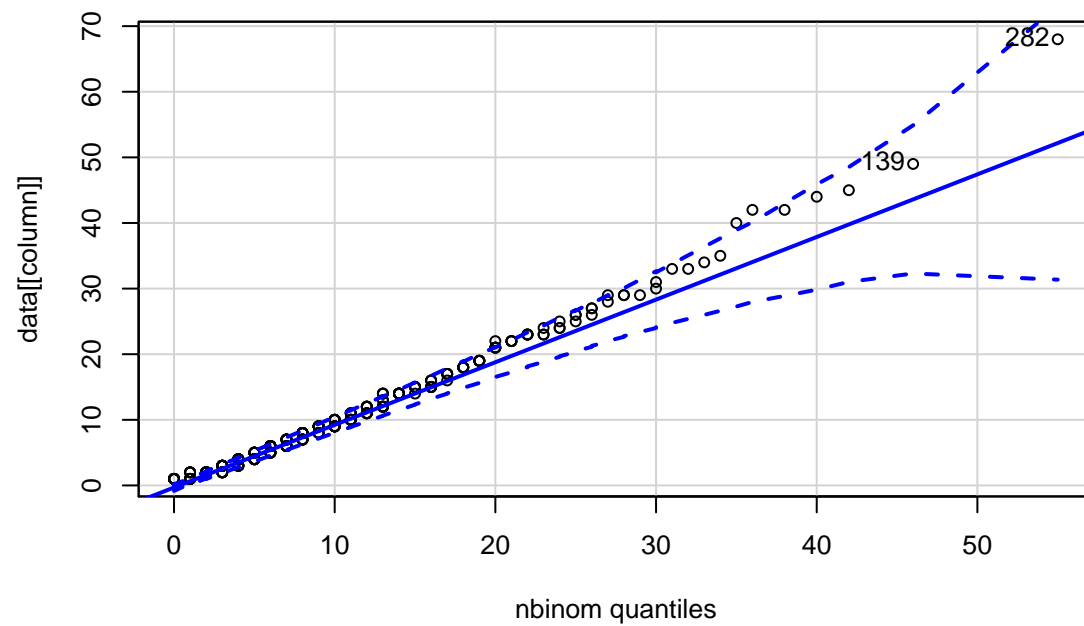
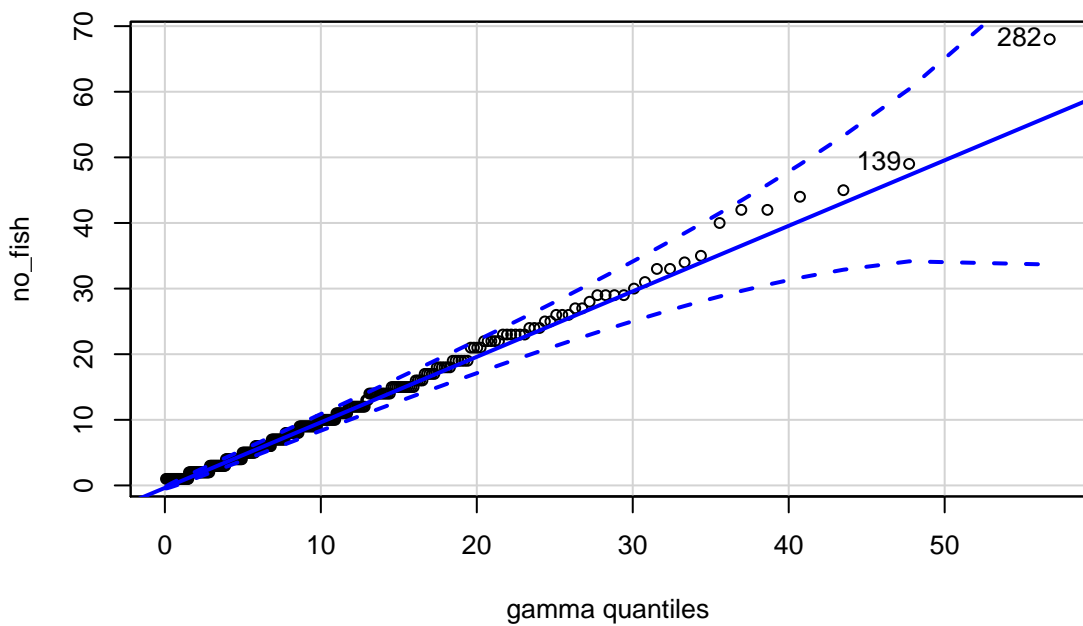
Normal distribution

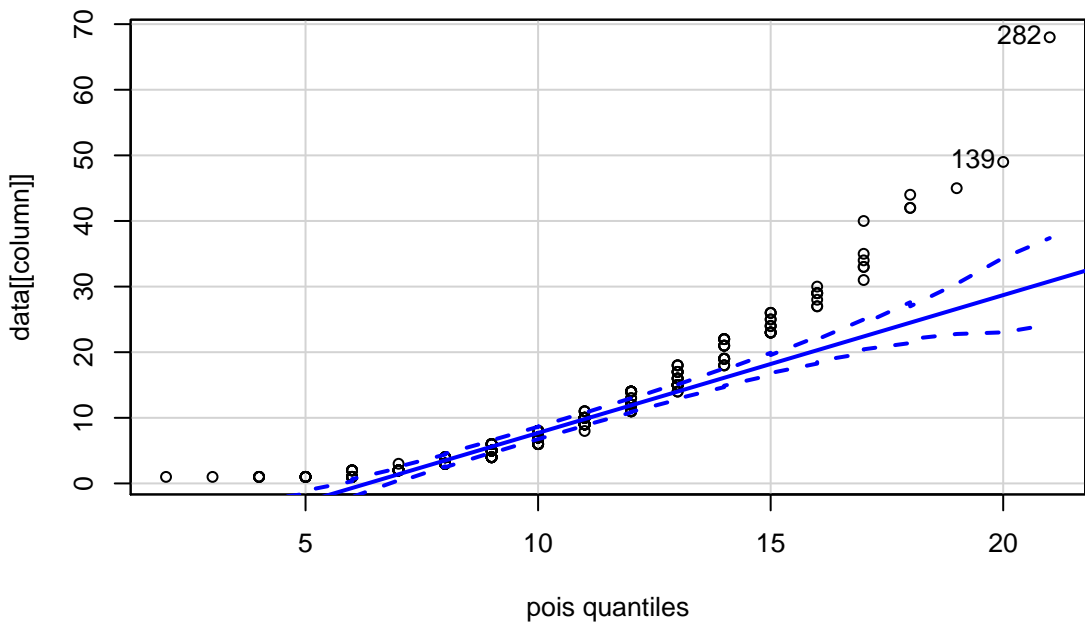


Log-normal distribution



Gamma distribution





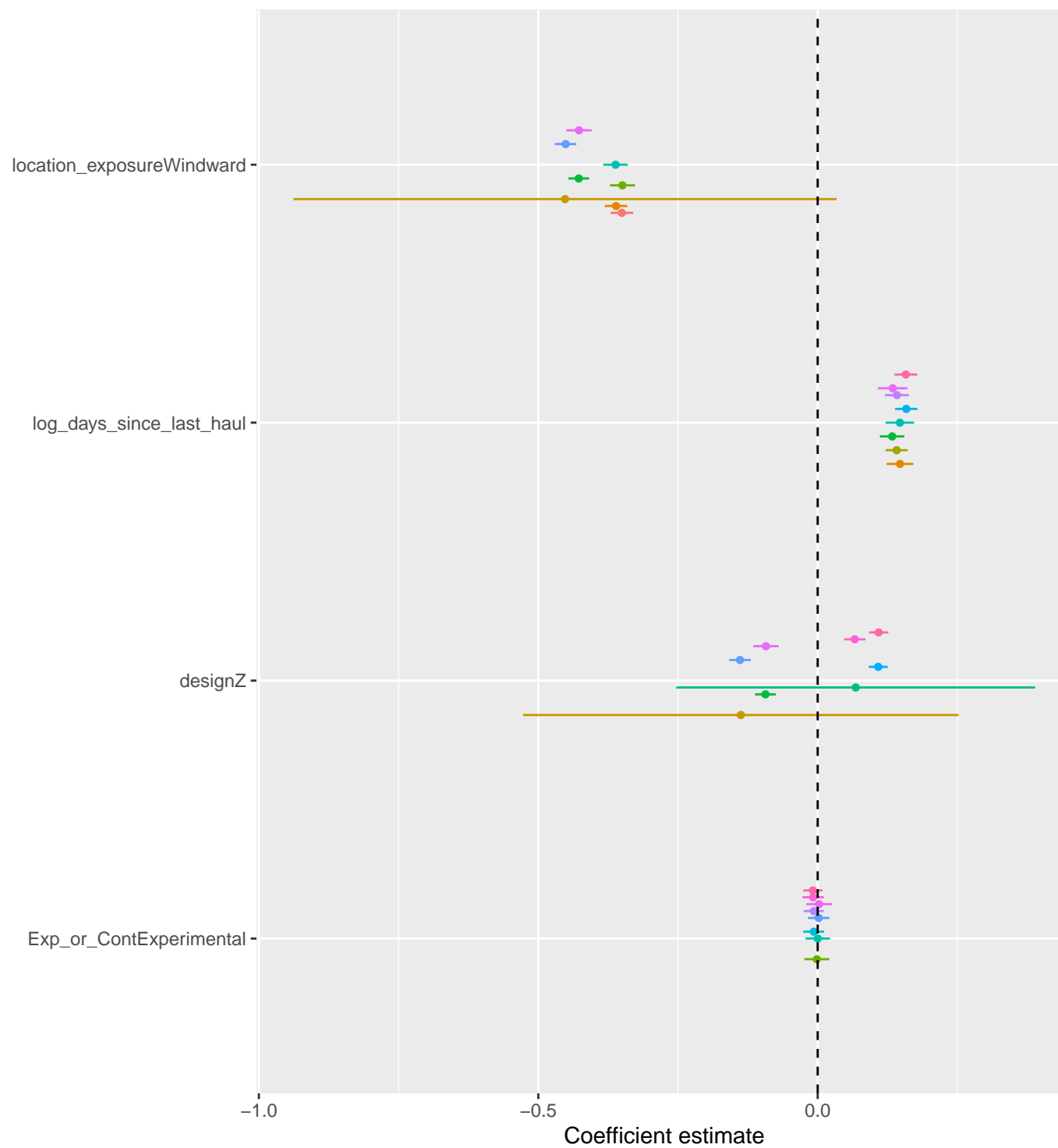
```

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 = 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 weight
5  2.291                +                5 -1020.054 2050.3  0.00  0.195
13 2.016                +          0.1214 6 -1019.435 2051.2  0.84  0.128
1  2.241                4 -1021.551 2051.2  0.93  0.123
6  2.402  +                +                6 -1019.813 2051.9  1.60  0.088
9  1.976                0.1165 5 -1021.004 2052.2  1.90  0.075
7  2.291                +  +                6 -1020.054 2052.4  2.08  0.069
14 2.118  +                +          0.1098 7 -1019.335 2053.0  2.74  0.050
2  2.193  +                5 -1021.465 2053.1  2.82  0.048
15 2.016                +  +          0.1212 7 -1019.435 2053.2  2.94  0.045
3  2.245                +                5 -1021.550 2053.3  2.99  0.044
10 1.867  +                0.1307 6 -1020.791 2053.9  3.55  0.033
8  2.403  +  +  +                7 -1019.813 2054.0  3.69  0.031
11 1.978                +          0.1169 6 -1021.003 2054.3  3.98  0.027
16 2.114  +  +  +          0.1105 8 -1019.335 2055.2  4.85  0.017
4  2.199  +  +                6 -1021.464 2055.2  4.90  0.017
12 1.873  +  +                0.1301 7 -1020.789 2056.0  5.64  0.012
Models ranked by AICc(x)
Random terms (all models):
...1 | TrapID..., ...1 | Date_YMD...

```

	model	sigma	logLik	AIC	BIC	deviance	df.residual
	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



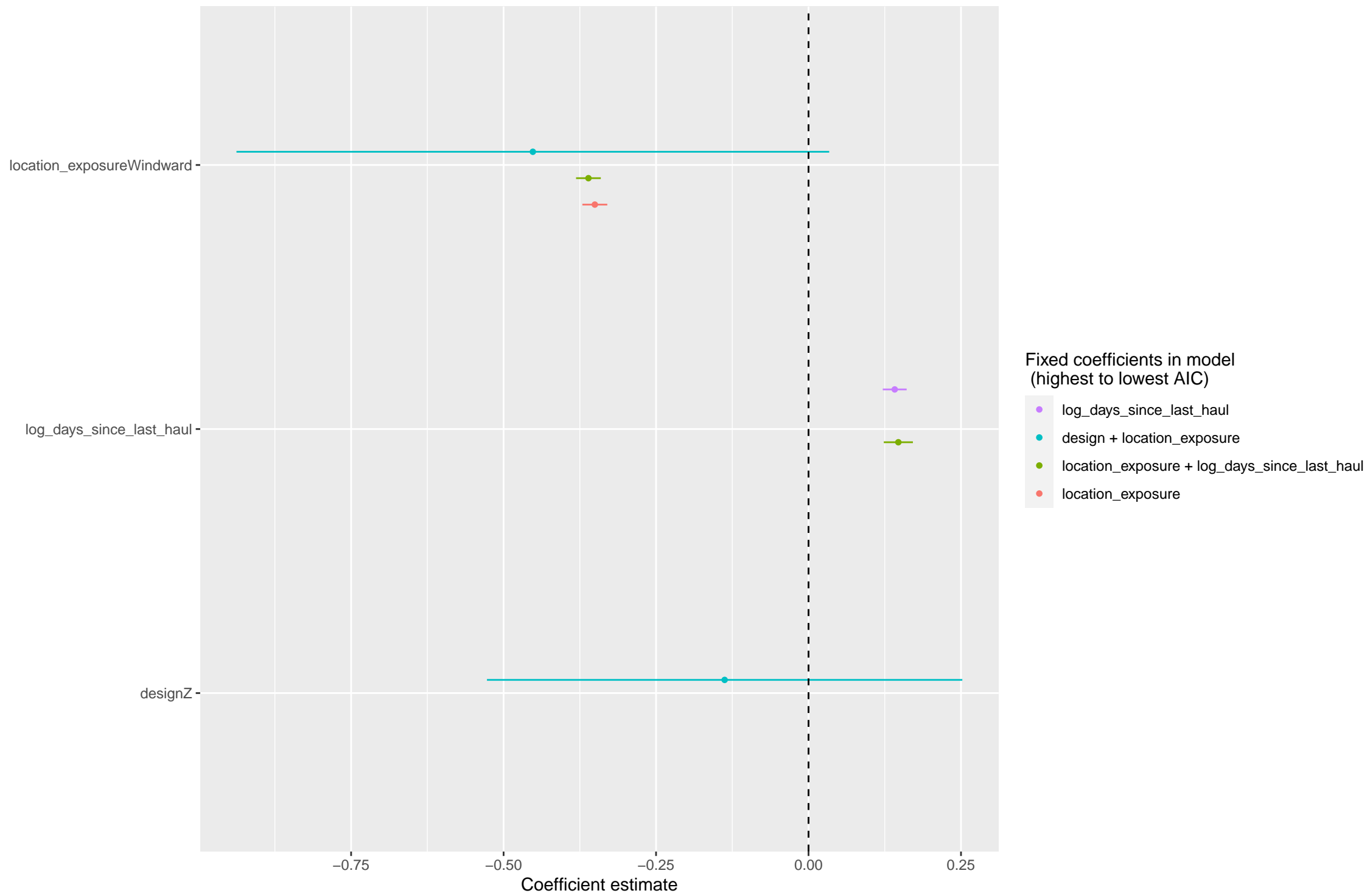
Fixed coefficients in model (highest to lowest AIC)

- 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

	model	sigma	logLik	AIC	BIC	deviance	df.residual
	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

-2

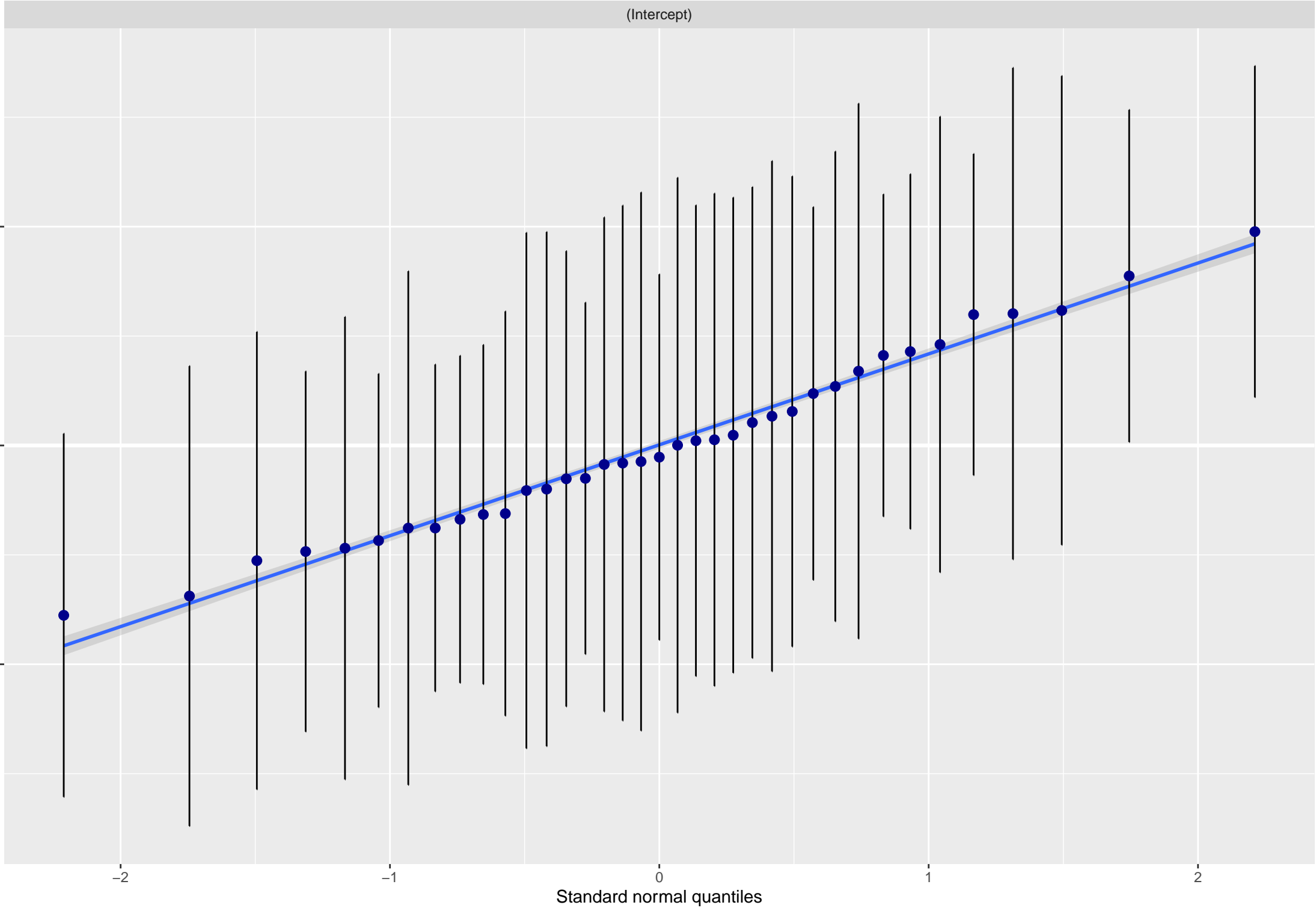
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.8

0.4

0.0

-0.4

-2

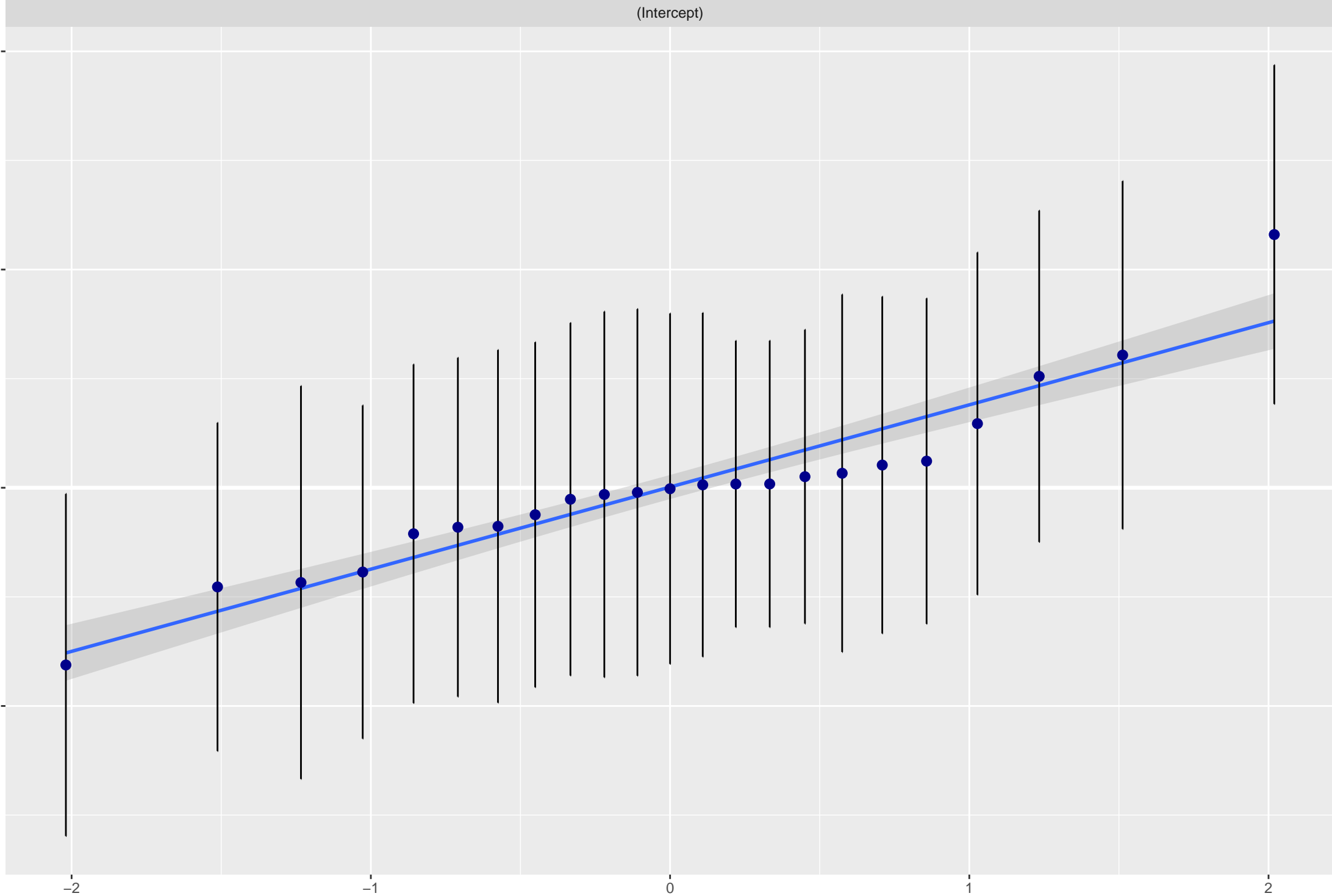
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.4

0.0

-0.4

-2

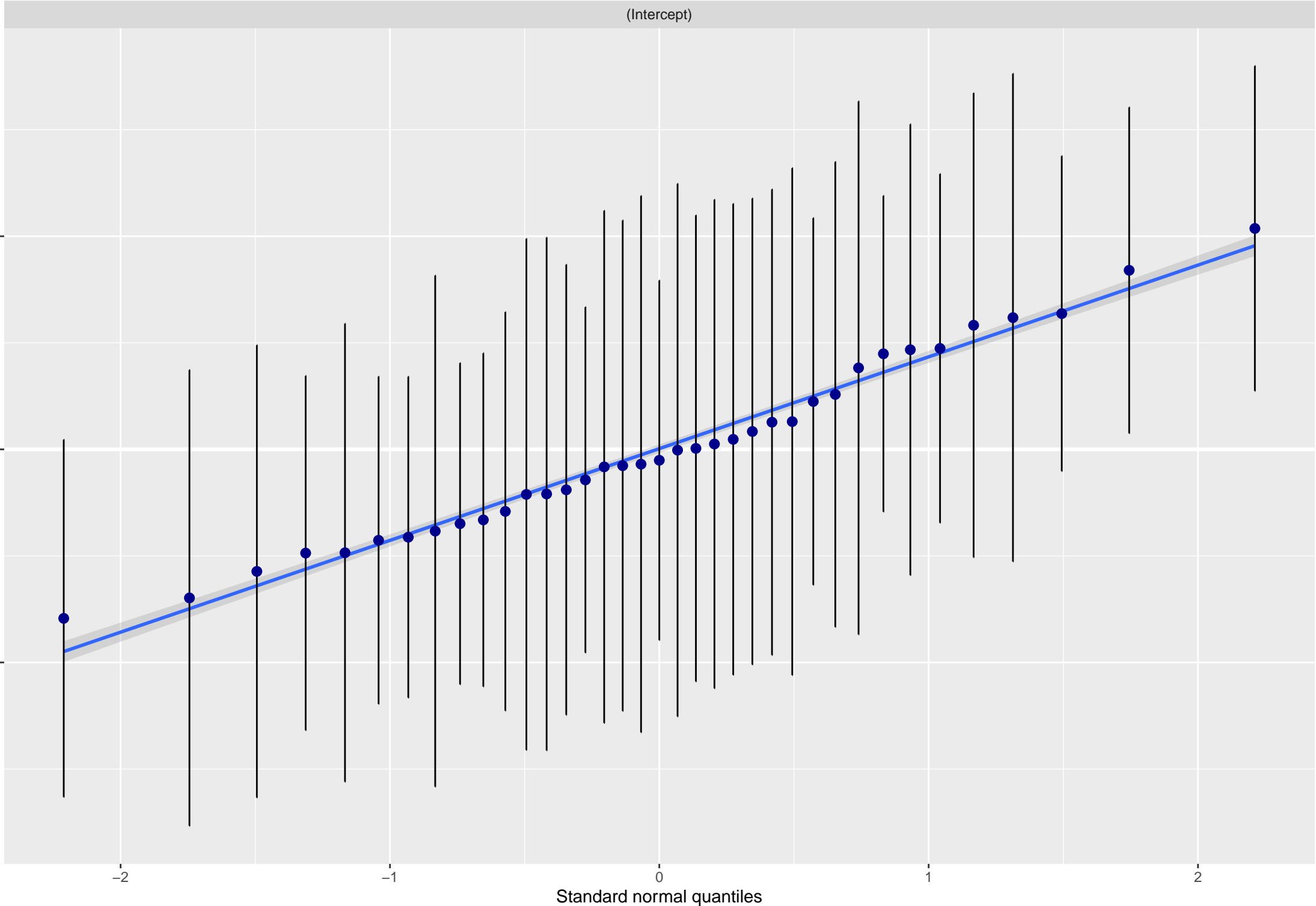
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.8
0.4
0.0
-0.4

-2

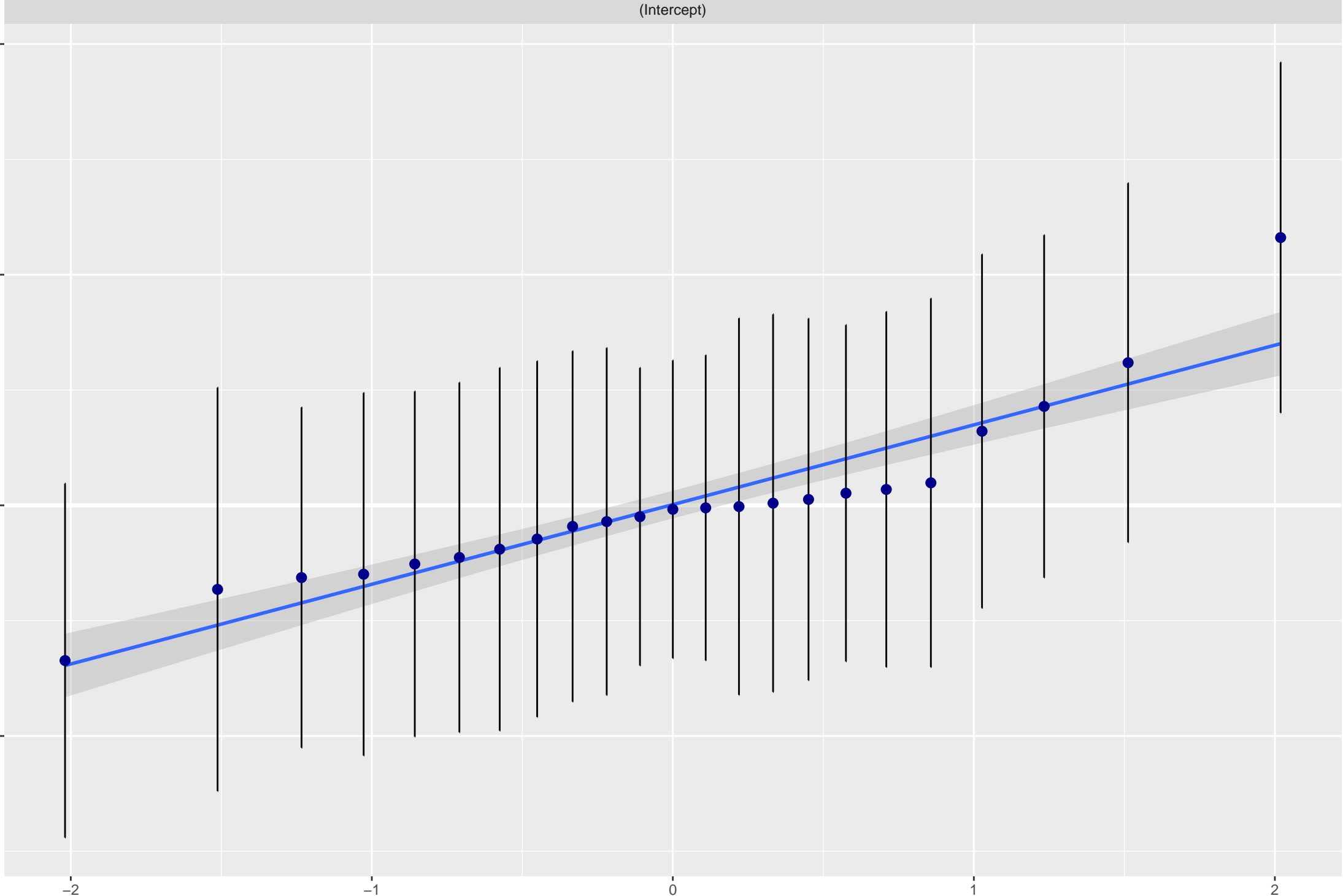
-1

0

1

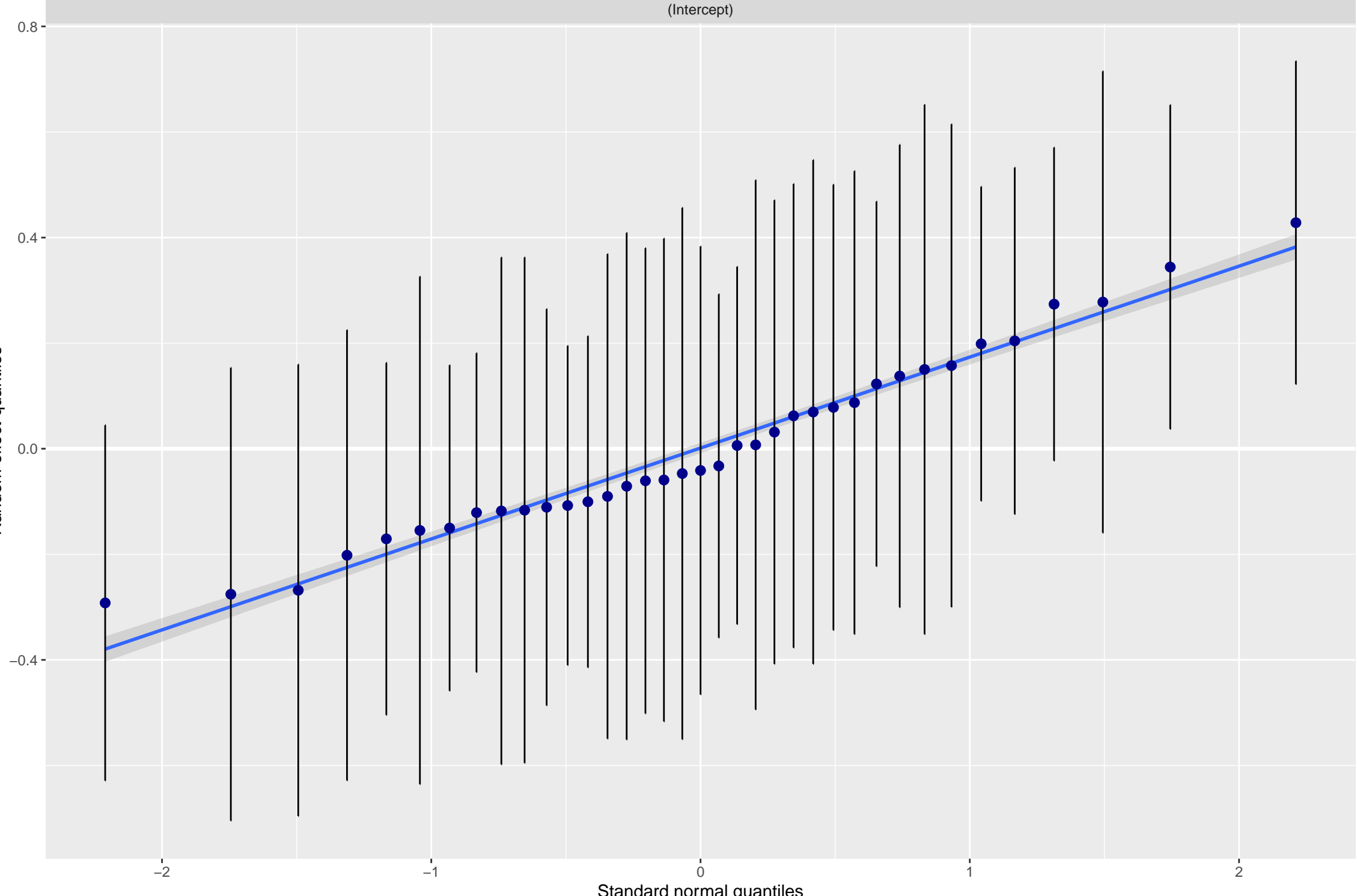
2

Standard normal quantiles



(Intercept)

Random effect quantiles



(Intercept)

Random effect quantiles

0.8

0.4

0.0

-0.4

-2

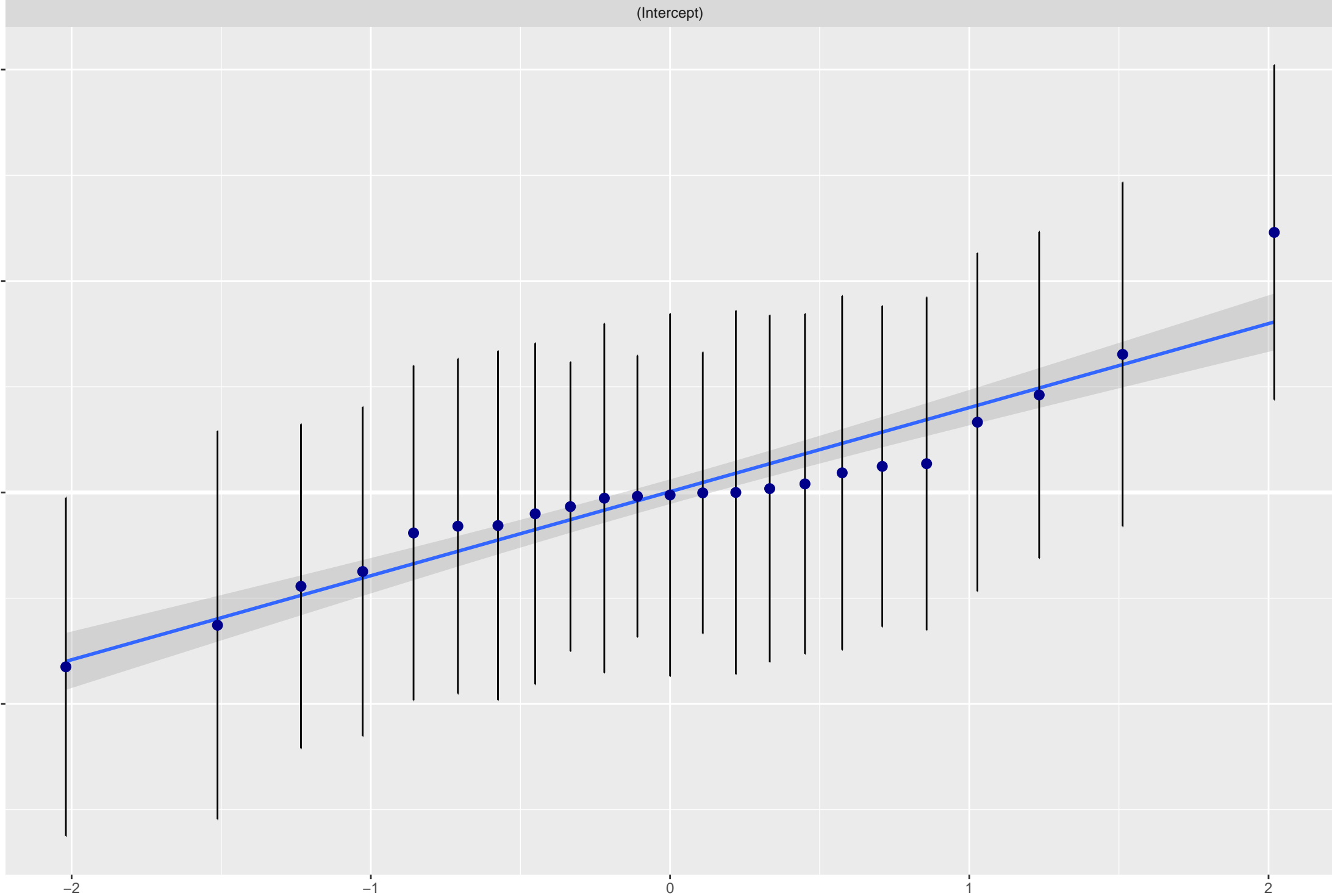
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.4

0.0

-0.4

-2

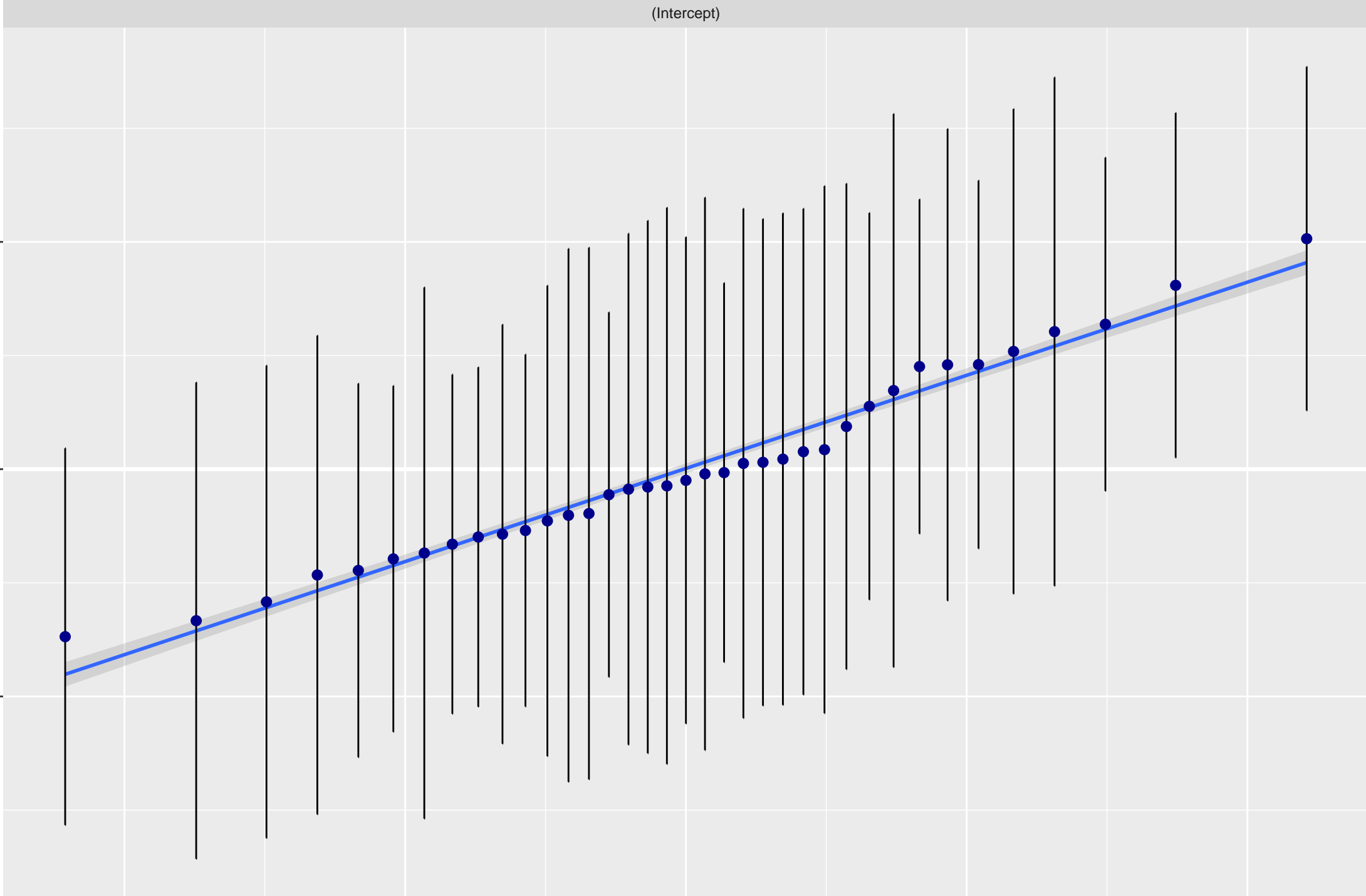
-1

0

1

2

Standard normal quantiles



(Intercept)

Random effect quantiles

0.8

0.4

0.0

-0.4

-2

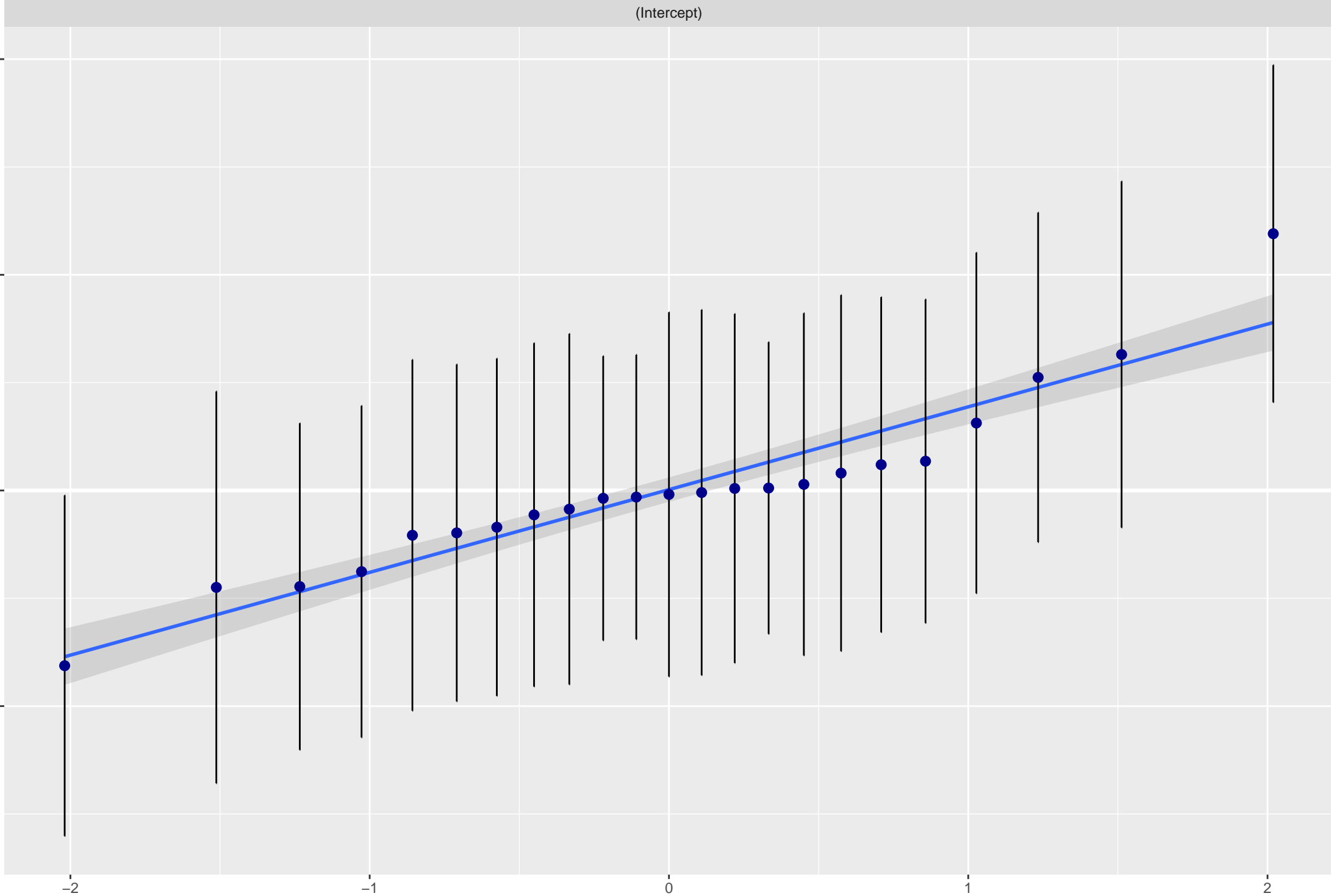
-1

0

1

2

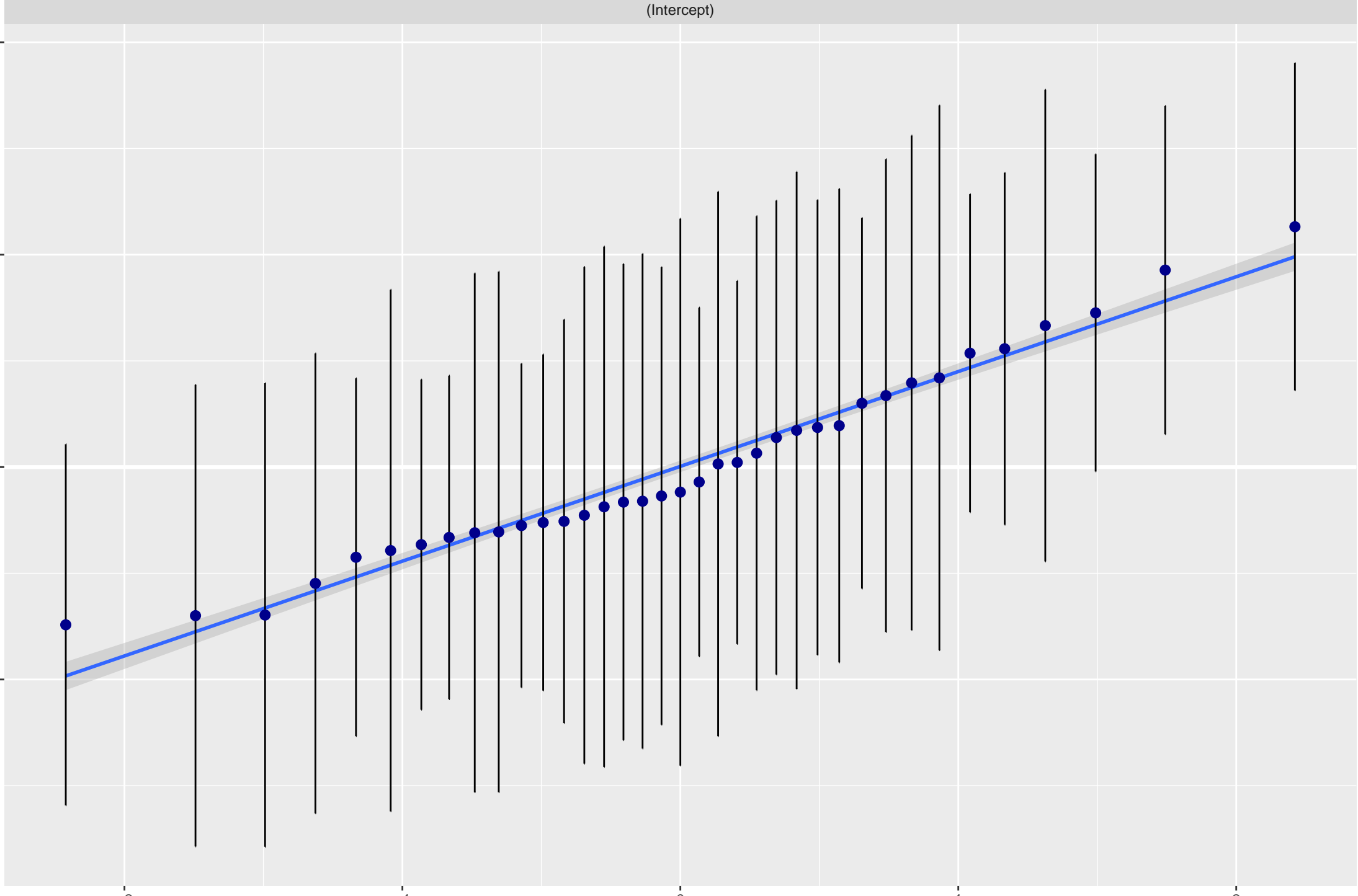
Standard normal quantiles



(Intercept)

Random effect quantiles

Standard normal quantiles



(Intercept)

Random effect quantiles

0.5

0.0

-0.5

-2

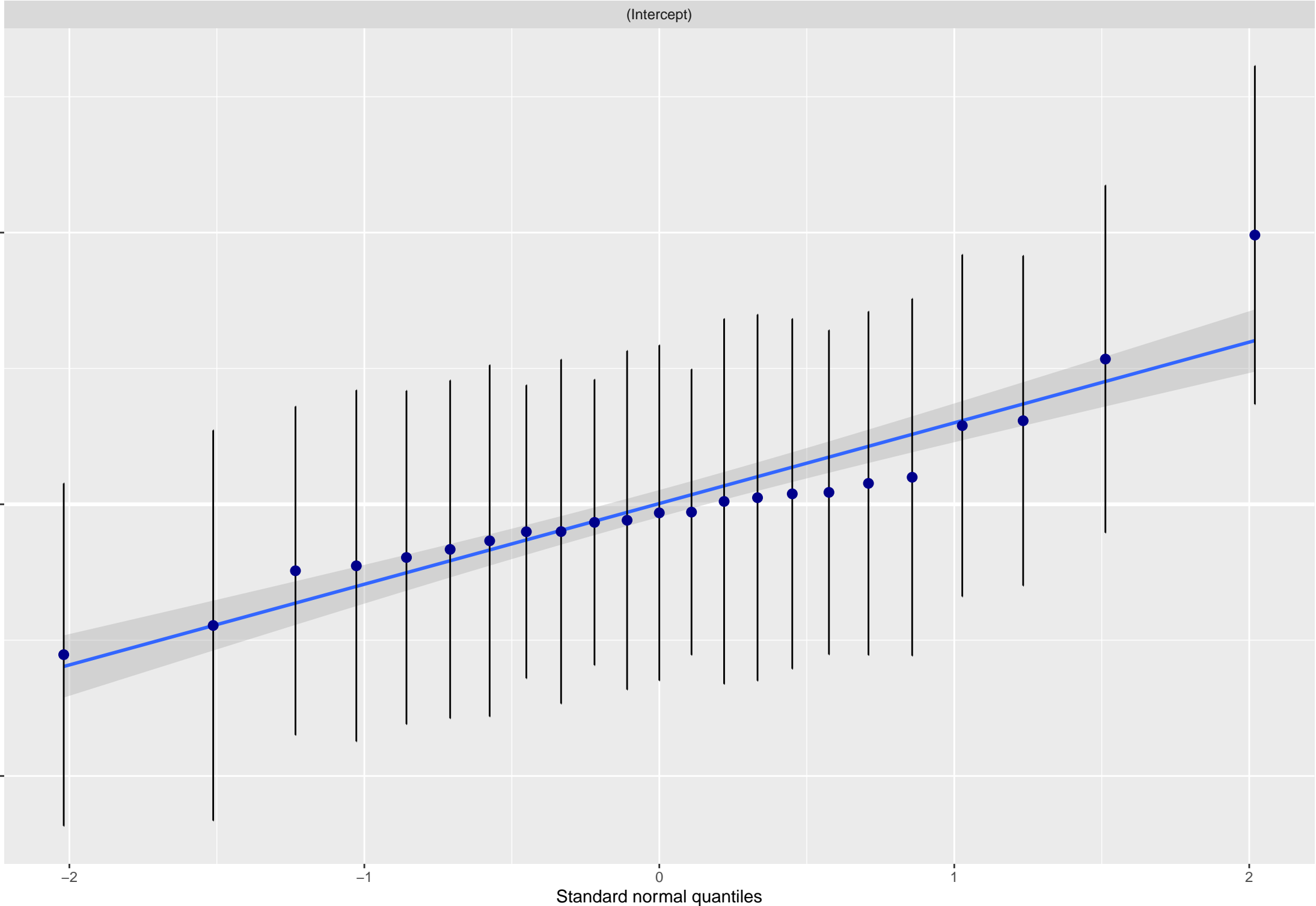
-1

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
convergence code: 0
Model failed to converge with max|grad| = 0.00782697 (tol = 0.001, 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
-1.1204 -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
convergence code: 0
Model failed to converge with max|grad| = 0.00687771 (tol = 0.001, 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 -0.7937 -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
convergence code: 0
Model failed to converge with max|grad| = 0.00772819 (tol = 0.001, 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) desgnZ
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) 0.04832  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
convergence code: 0
Model failed to converge with max|grad| = 0.00894953 (tol = 0.001, 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_sero
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_M
designZ        -0.620
lg_days_since_ -0.831  0.216
lctn_xpwrWn    -0.399  0.590  0.093
Exp_r_CntEx   -0.183 -0.038 -0.005 -0.043
```