

## Generalized linear mixed model with random effects

LatAmb: latency to approach ambiguous location in s  
Facility: facility a, b, and c  
BoxbeforeAmb: last location before testing with ambiguous location; positive (p) or negative (n)  
Breed: warmblood, pony, and thoroughbred  
Housing: group housing or box with paddock  
Pos.Side: trained positive location of the box; left (l) or right (r)  
Sex: mare (m) or gelding (g)  
ML: motor laterality (laterality index)  
SL: sensory laterality (laterality index)

### Initial forelimb use (MLstart):

```
glm(formula = LatAmb ~ PosSide + BoxBeforeAmb + MLstart/(Age +  
  Facility + Breed + housing + Sex), family = gaussian(identity),  
  data = Datenmatrix)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-19.7084	-6.1635	0.9422	4.4886	25.9218

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	19.519	12.199	1.600	0.161
PosSide[T.r]	10.539	18.094	0.582	0.581
BoxBeforeAmb[T.p]	14.282	13.821	1.033	0.341
MLstart	-156.998	121.395	-1.293	0.243
MLstart:Age	5.541	4.778	1.160	0.290
MLstart:Facility[T.f1]	-87.303	96.268	-0.907	0.399
MLstart:Facility[T.f2]	-24.721	88.628	-0.279	0.790
MLstart:Breed[T.Thoroughbred]	60.591	107.757	0.562	0.594
MLstart:Breed[T.Warmblood]	6.856	68.645	0.100	0.924
MLstart:housing[T.group housing]	100.889	111.959	0.901	0.402
MLstart:Sex[T.m]	13.059	40.735	0.321	0.759

(Dispersion parameter for gaussian family taken to be 339.5188)

Null deviance: 6291.5 on 16 degrees of freedom  
Residual deviance: 2037.1 on 6 degrees of freedom  
(61 observations deleted due to missingness)  
AIC: 153.61  
Number of Fisher Scoring iterations: 2

### **Simplified model with the best goodness of fit**

Call:

```
glm(formula = LatAmb ~ MLstart, family = gaussian(identity),  
  data = Datenmatrix)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-24.4113	-8.2052	-0.5927	8.9316	27.2017

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	27.089	4.155	6.519	9.7e-06 ***
MLstart	-44.858	12.083	-3.713	0.00208 **

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 218.5852)

Null deviance: 6291.5 on 16 degrees of freedom  
Residual deviance: 3278.8 on 15 degrees of freedom  
(61 observations deleted due to missingness)  
AIC: 143.7

Number of Fisher Scoring iterations: 2

### **Relaxed forelimb position (MLrelaxed):**

Call:

```
glm(formula = LatAmb ~ PosSide + BoxBeforeAmb + MLrelaxed/(Age +  
  Breed + Facility + housing + Sex), family = gaussian(identity),  
  data = Datenmatrix)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-23.8939	-11.8452	0.1796	5.7358	30.3379

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	18.737	13.411	1.397	0.212
PosSide[T.r]	11.832	17.116	0.691	0.515
BoxBeforeAmb[T.p]	-17.632	17.974	-0.981	0.364
MLrelaxed	21.675	88.385	0.245	0.814
MLrelaxed:Age	-4.991	4.500	-1.109	0.310
MLrelaxed:Breed[T.Thoroughbred]	-72.389	106.153	-0.682	0.521
MLrelaxed:Breed[T.Warmblood]	28.317	55.439	0.511	0.628
MLrelaxed:Facility[T.f1]	80.599	143.591	0.561	0.595
MLrelaxed:Facility[T.f2]	121.926	78.234	1.558	0.170
MLrelaxed:housing[T.group housing]	-28.689	148.233	-0.194	0.853
MLrelaxed:Sex[T.m]	-28.335	58.245	-0.486	0.644

(Dispersion parameter for gaussian family taken to be 604.7097)

Null deviance: 6291.5 on 16 degrees of freedom  
Residual deviance: 3628.3 on 6 degrees of freedom  
(61 observations deleted due to missingness)  
AIC: 163.42

Number of Fisher Scoring iterations: 2

### **Simplified model with the best goodness of fit**

Call:

```
glm(formula = LatAmb ~ MLrelaxed, family = gaussian(identity),  
  data = Datenmatrix)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-15.280	-10.191	-9.438	-1.028	42.896

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	18.27	5.63	3.246	0.00543 **
MLrelaxed	5.01	13.21	0.379	0.70978

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 415.4507)

Null deviance: 6291.5 on 16 degrees of freedom  
Residual deviance: 6231.8 on 15 degrees of freedom  
(61 observations deleted due to missingness)  
AIC: 154.62

Number of Fisher Scoring iterations: 2

### Task related forelimb position (MLbox):

Call:

```
glm(formula = LatAmb ~ PosSide + BoxBeforeAmb + MLbox/(Sex +  
housing + Facility + Breed + Age), family = gaussian(identity),  
data = Datenmatrix)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-16.9130	-5.7045	0.2229	4.9464	27.4710

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	25.913	9.571	2.707	0.0352 *
PosSide[T.r]	3.113	10.250	0.304	0.7716
BoxBeforeAmb[T.p]	-22.437	13.700	-1.638	0.1526
MLbox	-229.231	140.779	-1.628	0.1546
MLbox:Sex[T.m]	408.932	171.137	2.389	0.0541
MLbox:housing[T.group housing]	-313.324	207.044	-1.513	0.1810
MLbox:Facility[T.f1]	257.044	196.064	1.311	0.2378
MLbox:Facility[T.f2]	288.342	188.371	1.531	0.1767
MLbox:Breed[T.Thoroughbred]	-468.070	229.614	-2.039	0.0876
MLbox:Breed[T.Warmblood]	180.220	139.136	1.295	0.2428
MLbox:Age	1.513	7.744	0.195	0.8516

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 322.9118)

Null deviance: 6291.5 on 16 degrees of freedom  
Residual deviance: 1937.5 on 6 degrees of freedom  
(61 observations deleted due to missingness)  
AIC: 152.75

Number of Fisher Scoring iterations: 2

## Simplified model with the best goodness of fit

Call:

```
glm(formula = LatAmb ~ MLbox, family = gaussian(identity), data = Datenmatrix)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-17.561	-11.128	-7.712	-0.362	40.232

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	21.128	5.349	3.95	0.00128 **
MLbox	-15.295	18.644	-0.82	0.42486

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 401.4253)

Null deviance: 6291.5 on 16 degrees of freedom

Residual deviance: 6021.4 on 15 degrees of freedom

(61 observations deleted due to missingness)

AIC: 154.03

Number of Fisher Scoring iterations: 2

## Sensory laterality

Call:

```
glm(formula = LatAmb ~ BoxBeforeAmb + PosSide + SL/(Sex + housing +  
Facility + Breed + Age), family = gaussian(identity), data = Datenmatrix)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-20.891	-2.226	0.958	5.185	18.954

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	18.512	8.051	2.299	0.0611
BoxBeforeAmb[T.p]	-16.591	12.878	-1.288	0.2451
PosSide[T.r]	3.316	11.099	0.299	0.7752
SL	49.811	98.999	0.503	0.6328
SL:Sex[T.m]	-112.856	66.097	-1.707	0.1386
SL:housing[T.group housing]	72.000	115.301	0.624	0.5553
SL:Facility[T.f1]	-155.273	100.962	-1.538	0.1750
SL:Facility[T.f2]	-78.376	44.225	-1.772	0.1267
SL:Breed[T.Thouroughbred]	137.191	141.769	0.968	0.3706
SL:Breed[T.Warmblood]	-64.578	74.220	-0.870	0.4177
SL:Age	2.529	3.187	0.794	0.4577

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 224.4657)

Null deviance: 6291.5 on 16 degrees of freedom

Residual deviance: 1346.8 on 6 degrees of freedom

(61 observations deleted due to missingness)

AIC: 146.57

Number of Fisher Scoring iterations: 2

**Simplified model with the best goodness of fit**

Call:

```
glm(formula = LatAmb ~ SL/(Facility), family = gaussian(identity),  
     data = Datenmatrix)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-23.639	-7.606	-4.575	6.328	33.378

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept)	17.61	4.33	4.066	0.00134 **
SL	15.09	15.08	1.001	0.33508
SL:Facility[T.f1]	-96.24	35.29	-2.727	0.01728 *
SL:Facility[T.f2]	-53.92	27.60	-1.954	0.07256

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Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for gaussian family taken to be 267.899)

Null deviance: 6291.5 on 16 degrees of freedom

Residual deviance: 3482.7 on 13 degrees of freedom

(61 observations deleted due to missingness)

AIC: 148.72

Number of Fisher Scoring iterations: 2