

## Statistical Models

### Parameters for the analysis of social bonds in horses

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Complete GLMMCall:

```
glm(formula = Grooming frequency ~ Approach frequency * Proximity frequency/Aggression/Group/Group.composition/Individual/P.F/Rank/Sex/Size, family = gaussian(identity), data = Dataset)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-12.669	-3.727	-1.330	1.987	22.372

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )
(Intercept	3.095e+00	1.229e+00	2.518	0.012 *
Approaches	4.404e-01	1.855e-01	2.374	0.019 *
Proximity	2.134e-02	3.837e-02	0.556	0.57902
Approaches:Proximity	-1.166e-03	3.948e-03	-0.295	0.76820
Approaches:Proximity:Aggression	1.359e-03	9.707e-04	1.400	0.16393
Approaches:Proximity:Aggression:Group	-7.727e-04	5.077e-04	-1.522	0.13040
Approaches:Proximity:Aggression:Group:Group.composition	1.543e-04	1.319e-04	1.170	0.24412
Approaches:Proximity:Aggression:Group:Group.composition:Individual	-2.222e-07	1.163e-06	-0.191	0.84882
Approaches:Proximity:Aggression:Group:Group.composition:Individual:P.F	5.073e-07	5.879e-07	0.863	0.38969
Approaches:Proximity:Aggression:Group:Group.composition:Individual:P.F:Rang	6.583e-10	3.383e-08	0.019	0.98450
Approaches:Proximity:Aggression:Group:Group.composition:Individual:P.F:Rang:Sex	-2.271e-08	1.703e-08	-1.334	0.18455
Approach:Proximity:Aggression:Group:Group.composition:Individual:P.F:Rang:Sex:Size	8.415e-10	3.218e-10	2.616	0.009**

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

(Dispersion parameter for gaussian family taken to be 34.95904)

Null deviance: 6579.0 on 144 degrees of freedom  
Residual deviance: 4649.6 on 133 degrees of freedom  
AIC: 940.32

Reduced GLMM with lowest AIC

Call:

```
glm(formula = Grooming frequency ~ Approach frequency * Proximity frequency/Group.composition/P.F/Sex/Size,  
     family = gaussian(identity), data = Dataset)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-10.3949	-3.7105	-0.9086	2.2012	19.2137

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	1.8905318	1.1860616	1.594	0.113250	
Approaches	0.8174388	0.2084196	3.922	0.000138	***
Proximity	0.0424714	0.0368332	1.153	0.250887	
Approaches:Proximity	0.0071064	0.0036463	1.949	0.053346	.
Approaches:Proximity:Group.composition	-0.0070900	0.0046142	-1.537	0.126710	
Approaches:Proximity:Group.composition:P.F	-0.0011052	0.0030664	-0.360	0.719080	
Approaches:Proximity:Group.composition:P.F:Sex	-0.0035040	0.0012978	-2.700	0.007809	**
Approaches:Proximity:Group.composition:P.F:Sex:Size	0.0002409	0.0000566	4.255	3.85e-05	***

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

(Dispersion parameter for gaussian family taken to be 31.76881)

Null deviance: 6579.0 on 144 degrees of freedom  
Residual deviance: 4352.3 on 137 degrees of freedom  
AIC: 922.74

Complete GLM

```
Call:
glm(formula = Size ~ Approach frequency + Grooming frequency +
     Proximity frequency, family = gaussian(identity), data = Dataset)
```

Deviance Residuals:

Min	1Q	Median	3Q	Max
-14.2527	-4.0024	0.1624	5.4185	9.0032

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	22.03370	0.98176	22.443	< 2e-16	***
Approaches	-0.33806	0.07523	-4.494	1.45e-05	***
Grooming	0.17582	0.08342	2.108	0.0368	*
Proximity	-0.15052	0.02580	-5.834	3.55e-08	***

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

(Dispersion parameter for gaussian family taken to be 35.99604)

Null deviance: 7170.7 on 144 degrees of freedom

Residual deviance: 5075.4 on 141 degrees of freedom

AIC: 937.03

Number of Fisher Scoring iterations: 2