

Supplementary Material

Investigating the Relationship between Breeding and Welfare in Captive Chimpanzees (*Pan troglodytes*).

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Results of the Linear Mixed Effects Models.

Model 1a. Weekly rate of abnormal or stress-related behaviours

Reference category for variable Reproductive Category is *without* dependent young.

Random effects

	Variance	Standard Deviation
Focal (Intercept)	0.00372	0.06099
Social Group (Intercept)	0.00000	0.00000
Residual	0.01086	0.10419

Fixed Effects

	Estimate	Standard Error	t value
(Intercept)	0.031356	0.014408	2.176
Reproductive Category	-0.005174	0.026188	-0.198
Mean Centered Age	0.001466	0.001597	0.918

Model 1b. Weekly rate of play

Reference category for variable Reproductive Category is *without* dependent young.

Random effects

	Variance	Standard Deviation
Focal (Intercept)	3.685e-05	0.00607
Social Group (Intercept)	0.00000	0.00000
Residual	1.466e-03	0.03829

Fixed Effects

	Estimate	Standard Error	t value
(Intercept)	0.0066238	0.0031283	2.117
Reproductive Category	-0.0017561	0.0057049	-0.308
Mean Centered Age	0.0004048	0.0003497	1.158

Model 1c. Response to social challenge

Reference category for variable Reproductive Category is *without* dependent young.

Random effects

	Variance	Standard Deviation
Focal (Intercept)	1.155e-05	0.003398
Social Group (Intercept)	0.00000	0.00000
Residual	4.630e-04	0.021519

Fixed Effects

	Estimate	Standard Error	t value
(Intercept)	0.0075747	0.0017150	4.417
Reproductive Category	-0.0025240	0.0029668	-0.851
Mean Centered Age	0.0003069	0.0001917	1.601

Model 2a. Weekly rate of abnormal or stress-related behaviours

Random effects			
	Variance	Standard Deviation	
Focal (Intercept)	0.003663	0.06052	
Social Group (Intercept)	0.00000	0.00000	
Residual	0.010838	0.10411	
Fixed Effects			
	Estimate	Standard Error	t value
(Intercept)	0.013771	0.020724	0.664
Proximity to Young	0.037130	0.040022	0.928
Mean Centered Age	0.001706	0.001534	1.112

Model 2b. Weekly rate of play

Random effects			
	Variance	Standard Deviation	
Focal (Intercept)	2.936e-05	0.005419	
Social Group (Intercept)	0.00000	0.00000	
Residual	1.469e-03	0.038323	
Fixed Effects			
	Estimate	Standard Error	t value
(Intercept)	0.0028474	0.0044117	0.645
Proximity to Young	0.0077479	0.0087520	0.885
Mean Centered Age	0.0004675	0.0003330	1.404

Model 2c. Response to social challenge

Random effects			
	Variance	Standard Deviation	
Focal (Intercept)	1.253e-05	0.00354	
Social Group (Intercept)	0.00000	0.00000	
Residual	4.633e-04	0.02152	
Fixed Effects			
	Estimate	Standard Error	t value
(Intercept)	0.0061907	0.0025159	2.461
Proximity to Young	0.0010838	0.0044629	0.243
Mean Centered Age	0.0003480	0.0001882	1.849