

Electronic Supplementary Material

Sex Differences in the Development of Social Relationships in Rhesus Macaques (*Macaca mulatta*)

Lars Kulik · Federica Amici · Doreen Langos · Anja Widdig

Corresponding author: Lars Kulik, Institute of Biology, Faculty of Bioscience, Pharmacy and Psychology, University of Leipzig, Talstraße 33, 04103 Leipzig, Germany, lars_kulik@eva.mpg.de

Appendix S3 Model result tables

Table SI Results of GLMM for the probability of spatial proximity between focal and partner

Term	Estimate	SE	χ^2	d.f.	P
(Intercept)	-1.95	0.07	a	a	a
ac1 ^c	0.15	0.01	751.330	1	< 0.001
ac2 ^c	0.12	0.00	1866.800	1	< 0.001
N of maternal kin per day ^{b,c}	-0.04	0.02	2.321	1	0.128
Group size per day ^c	-0.04	0.01	30.080	1	< 0.001
Sex ratio per day ^c	0.05	0.01	23.528	1	< 0.001
Mother present (yes=1; no=0)	-0.11	0.07	a	a	a
Focal age ^c	0.49	0.02	a	a	a
Focal age ^{2c}	-0.40	0.02	a	a	a
Focal sex (♀=0; ♂=1)	0.11	0.03	a	a	a
Partner rank ^c	-0.23	0.03	a	a	a
Partner rank ^c	-0.05	0.02	a	a	a
Partner sex (♀=0; ♂=1)	-0.75	0.07	a	a	a
Age difference ^c	0.10	0.02	a	a	a
Kin (maternal, nonkin)	-3.10	0.02	a	a	a
Kin (maternal, paternal)	-3.01	0.05	a	a	a
Focal sex (♀=0; ♂=1):mother present (yes=1; no=0)	-0.37	0.03	a	a	a
Focal sex (♀=0; ♂=1):partner rank ^c	-0.07	0.02	a	a	a
Focal sex (♀=0; ♂=1):age difference ^{b,c}	0.06	0.02	a	a	a
Focal sex (♀=0; ♂=1):kin (maternal, nonkin)	-0.16	0.03	a	a	a
Focal sex (♀=0; ♂=1):kin (maternal, paternal)	0.03	0.08	a	a	a
Focal sex (♀=0; ♂=1):partner sex (♀=0; ♂=1)	0.61	0.03	a	a	a
Focal age ^c :focal sex (♀=0; ♂=1)	-0.21	0.03	a	a	a
Focal age ^{2c} :focal sex (♀=0; ♂=1)	-0.15	0.03	a	a	a
Focal age ^c :mother present (yes=1; no=0)	-1.04	0.02	a	a	a
Focal age ^{2c} :mother present (yes=1; no=0)	0.42	0.02	a	a	a
Focal age ^c :partner rank ^c	-0.02	0.01	a	a	a
Focal age ^{2c} :partner rank ^c	0.00	0.01	a	a	a
Focal age ^c :age difference ^{b,c}	0.01	0.01	a	a	a
Focal age ^{2c} :age difference ^{b,c}	0.01	0.01	a	a	a
Focal age ^c :focal rank ^c	0.07	0.01	124.080	2	< 0.001
Focal age ^{2c} :focal rank ^c	-0.03	0.01			
Focal age ^c :kin (maternal, nonkin)	-0.12	0.02	a	a	a
Focal age ^{2c} :kin (maternal, nonkin)	0.13	0.02	a	a	a
Focal age ^c :kin (maternal, paternal)	0.00	0.04	a	a	a
Focal age ^{2c} :kin (maternal, paternal)	0.00	0.04	a	a	a
Focal age ^c :partner sex (♀=0; ♂=1)	0.13	0.02	a	a	a
Focal age ^{2c} :partner sex (♀=0; ♂=1)	-0.02	0.02	a	a	a
Focal age ^c :focal sex (♀=0; ♂=1):mother present (yes=1; no=0)	-0.37	0.03	197.800	2	< 0.001
Focal age ^{2c} :focal sex (♀=0; ♂=1):mother present (yes=1; no=0)	0.10	0.03			
Focal age ^c :focal sex (♀=0; ♂=1):partner rank ^c	0.00	0.01	7.309	2	0.026
Focal age ^{2c} :focal sex (♀=0; ♂=1):partner rank ^c	0.03	0.01			
Focal age ^c :focal sex (♀=0; ♂=1):age difference ^{b,c}	-0.03	0.01	48.634	2	< 0.001
Focal age ^{2c} :focal sex (♀=0; ♂=1):age difference ^{b,c}	-0.08	0.01			
Focal age ^c :focal sex (♀=0; ♂=1):kin (maternal, nonkin)	0.02	0.02	13.515	4	0.009
Focal age ^{2c} :focal sex (♀=0; ♂=1):kin (maternal, nonkin)	-0.05	0.03			
Focal age ^c :focal sex (♀=0; ♂=1):kin (maternal, paternal)	0.07	0.06			
Focal age ^{2c} :focal sex (♀=0; ♂=1):kin (maternal, paternal)	0.11	0.06			
Focal age ^c :focal sex (♀=0; ♂=1):partner sex (♀=0; ♂=1)	0.47	0.02	434.160	2	< 0.001
Focal age ^{2c} :focal sex (♀=0; ♂=1):partner sex (♀=0; ♂=1)	0.05	0.03			

^a Not shown because lacking a meaningful interpretation.

^b Square root transformed prior to being z-transformed.

^c Predictors were z-transformed to a mean=0 and SD=1.

Table SII Results of GLMM for the probability of grooming between focal and partner

Term	Estimate	SE	χ^2	d.f.	P
(Intercept)	-4.21	0.11	a	a	a
ac1 ^c	0.10	0.02	24.035	1	< 0.001
ac2 ^c	0.04	0.00	116.600	1	< 0.001
N of maternal kin per day ^{b,c}	-0.27	0.04	28.916	1	< 0.001
Group size per day ^c	0.14	0.02	39.911	1	< 0.001
Sex ratio per day ^c	-0.05	0.04	1.418	1	0.234
Mother present (yes=1; no=0)	-0.04	0.08	a	a	a
Focal age ^c	0.94	0.07	a	a	a
Focal age ^{2c}	-0.37	0.06	a	a	a
Focal sex (♀=0; ♂=1)	-0.19	0.13	a	a	a
Focal rank ^c	0.00	0.07	a	a	a
Partner rank ^c	-0.04	0.05	0.674	1	0.412
Partner sex (♀=0; ♂=1)	-0.82	0.14	a	a	a
Age difference ^c	-0.33	0.07	a	a	a
Kin (maternal, nonkin)	-4.17	0.08	a	a	a
Kin (maternal, paternal)	-4.22	0.23	a	a	a
Focal sex (♀=0; ♂=1):mother present (yes=1; no=0)	-0.85	0.12	a	a	a
Focal sex (♀=0; ♂=1):age difference ^{b,c}	0.32	0.07	a	a	a
Focal sex (♀=0; ♂=1):focal rank ^c	0.06	0.10	a	a	a
Focal sex (♀=0; ♂=1):kin (maternal, nonkin)	-0.14	0.10	9.077	2	0.011
Focal sex (♀=0; ♂=1):kin (maternal, paternal)	0.55	0.25			
Focal sex (♀=0; ♂=1):partner sex (♀=0; ♂=1)	1.16	0.14	a	a	a
Focal age ^c :focal sex (♀=0; ♂=1)	-0.29	0.09	a	a	a
Focal age ^{2c} :focal sex (♀=0; ♂=1)	-0.24	0.08	a	a	a
Focal age ^c :mother present (yes=1; no=0)	-0.60	0.07	a	a	a
Focal age ^{2c} :mother present (yes=1; no=0)	-0.07	0.07	a	a	a
Focal age ^c :age difference ^{b,c}	-0.04	0.04	a	a	a
Focal age ^{2c} :age difference ^{b,c}	0.14	0.04	a	a	a
Focal age ^c :focal rank ^c	0.10	0.04	a	a	a
Focal age ^{2c} :focal rank ^c	0.01	0.03	a	a	a
Focal age ^c :kin (maternal, nonkin)	-0.01	0.06	24.455	4	< 0.001
Focal age ^{2c} :kin (maternal, nonkin)	0.18	0.05			
Focal age ^c :kin (maternal, paternal)	0.51	0.20			
Focal age ^{2c} :kin (maternal, paternal)	-0.14	0.17			
Focal age ^c :partner sex (♀=0; ♂=1)	0.35	0.10	a	a	a
Focal age ^{2c} :partner sex (♀=0; ♂=1)	-0.11	0.09	a	a	a
Focal age ^c :focal sex (♀=0; ♂=1):mother present (yes=1; no=0)	-0.71	0.11	41.584	2	< 0.001
Focal age ^{2c} :focal sex (♀=0; ♂=1):mother present (yes=1; no=0)	0.26	0.11			
Focal age ^c :focal sex (♀=0; ♂=1):age difference ^{b,c}	0.09	0.06	10.672	2	0.005
Focal age ^{2c} :focal sex (♀=0; ♂=1):age difference ^{b,c}	-0.18	0.06			
Focal age ^c :focal sex (♀=0; ♂=1):focal rank ^c	-0.14	0.06	6.492	2	0.039
Focal age ^{2c} :focal sex (♀=0; ♂=1):focal rank ^c	0.02	0.05			
Focal age ^c :focal sex (♀=0; ♂=1):partner sex (♀=0; ♂=1)	0.63	0.13	27.236	2	< 0.001
Focal age ^{2c} :focal sex (♀=0; ♂=1):partner sex (♀=0; ♂=1)	-0.15	0.12			

^a Not shown because lacking a meaningful interpretation.

^b Square root transformed prior to being z-transformed.

^c Predictors were z-transformed to a mean=0 and SD=1.

Table SIII Results of GLMM for the probability of play between focal and partner

Term	Estimate	SE	χ^2	d.f.	P
(Intercept)	-4.95	0.15	^a	^a	^a
ac1 ^c	0.29	0.02	239.440	2	< 0.001
ac2 ^c	0.04	0.00	121.260	2	< 0.001
N of maternal kin per day ^{b,c}	-0.31	0.05	35.208	2	< 0.001
Group size per day ^c	-0.04	0.02	3.940	2	0.140
Sex ratio per day ^c	-0.05	0.05	2.912	2	0.233
Mother present (yes=1; no=0)	-1.28	0.10	^a	^a	^a
Focal age ^c	0.29	0.10	^a	^a	^a
Focal age ² ^c	-0.89	0.11	^a	^a	^a
Focal sex (♀=0; ♂=1)	-1.24	0.19	^a	^a	^a
Focal rank ^c	0.23	0.10	^a	^a	^a
Partner rank ^c	0.21	0.06	^a	^a	^a
Partner sex (♀=0; ♂=1)	-0.53	0.14	^a	^a	^a
Age difference ^c	-1.73	0.13	^a	^a	^a
Kin (maternal, nonkin)	-4.19	0.09	^a	^a	^a
Kin (maternal, paternal)	-4.03	0.21	^a	^a	^a
Focal sex (♀=0; ♂=1):mother present (yes=1; no=0)	-0.67	0.14	^a	^a	^a
Focal sex (♀=0; ♂=1):age difference ^{b,c}	-0.66	0.15	^a	^a	^a
Focal sex (♀=0; ♂=1):focal rank ^c	-0.19	0.12	^a	^a	^a
Focal sex (♀=0; ♂=1):kin (maternal, nonkin)	0.28	0.10	33.016	2	< 0.001
Focal sex (♀=0; ♂=1):kin (maternal, paternal)	1.18	0.22			
Focal sex (♀=0; ♂=1):partner sex (♀=0; ♂=1)	1.84	0.14	^a	^a	^a
Focal age ^c :focal sex (♀=0; ♂=1)	-0.83	0.13	^a	^a	^a
Focal age ² ^c :focal sex (♀=0; ♂=1)	0.51	0.14	^a	^a	^a
Focal age ^c :mother present (yes=1; no=0)	-0.92	0.09	^a	^a	^a
Focal age ² ^c :mother present (yes=1; no=0)	0.70	0.10	^a	^a	^a
Focal age ^c :partner rank ^c	0.09	0.03	14.349	2	0.001
Focal age ² ^c :partner rank ^c	-0.10	0.03			
Focal age ^c :age difference ^{b,c}	0.72	0.09	^a	^a	^a
Focal age ² ^c :age difference ^{b,c}	-0.12	0.10	^a	^a	^a
Focal age ^c :focal rank ^c	0.16	0.05	^a	^a	^a
Focal age ² ^c :focal rank ^c	-0.20	0.05	^a	^a	^a
Focal age ^c :kin (maternal, nonkin)	0.17	0.05	29.894	4	< 0.001
Focal age ² ^c :kin (maternal, nonkin)	0.16	0.06			
Focal age ^c :kin (maternal, paternal)	0.38	0.10			
Focal age ² ^c :kin (maternal, paternal)	-0.02	0.11			
Focal age ^c :partner sex (♀=0; ♂=1)	0.64	0.09	^a	^a	^a
Focal age ² ^c :partner sex (♀=0; ♂=1)	0.01	0.10	^a	^a	^a
Focal age ^c :focal sex (♀=0; ♂=1):mother present (yes=1; no=0)	-0.53	0.12	20.174	2	< 0.001
Focal age ² ^c :focal sex (♀=0; ♂=1):mother present (yes=1; no=0)	-0.06	0.13			
Focal age ^c :focal sex (♀=0; ♂=1):age difference ^{b,c}	-0.89	0.11	60.390	2	< 0.001
Focal age ² ^c :focal sex (♀=0; ♂=1):age difference ^{b,c}	0.18	0.12			
Focal age ^c :focal sex (♀=0; ♂=1):focal rank ^c	-0.20	0.06	11.352	2	0.003
Focal age ² ^c :focal sex (♀=0; ♂=1):focal rank ^c	0.18	0.06			
Focal age ^c :focal sex (♀=0; ♂=1):partner sex (♀=0; ♂=1)	0.61	0.12	32.189	2	< 0.001
Focal age ² ^c :focal sex (♀=0; ♂=1):partner sex (♀=0; ♂=1)	-0.25	0.12			

^a Not shown because lacking a meaningful interpretation.^b Square root transformed prior to being z-transformed.^c Predictors were z-transformed to a mean=0 and SD=1.