

Supplementary material

Table S1 – Demographic information for Chimpanzees at Edinburgh Zoo

Name	ID	Sex	Age in 2010	Rearing	Original Group
Cindy	CI	F	46	Wild	Edinburgh
David	DA	M	35	Mother	Edinburgh
Edith	ED	F	13	Mother	Beekse Bergen
Emma	EM	F	30	Mother	Edinburgh
Eva	EV	F	31	Nursery	Beekse Bergen
Frek	FR	M	16	Mother	Beekse Bergen
Heleen	HL	F	18	Mother	Beekse Bergen
Kilimi	KL	F	17	Mother	Edinburgh
Kindia	KD	M	13	Mother	Edinburgh
Lianne	LI	F	21	Mother	Beekse Bergen
Liberius	LB	M	11	Mother	Edinburgh
Louis	LO	M	34	Wild	Edinburgh
Lucy	LU	F	33	Mother	Edinburgh
Paul	PA	M	16	Mother	Beekse Bergen
Pearl	PE	F	41	Wild	Beekse Bergen
Qafzeh	Q	M	18	Mother	Edinburgh
Rene	RE	M	17	Nursery	Beekse Bergen
Sophie	SO	F	30	Nursery	Beekse Bergen

Table S2 – Raw frequencies of yawning, scratching and R/R shown by each chimpanzee in study one and the proportion of focal samples in which each chimpanzee engaged in these behaviours

ID	Total Number of Focal samples	Yawning		Scratching		R/R	
		Frequency	Proportion	Frequency	Proportion	Frequency	Proportion
CI	28	6	0.21	23	0.82	0	0
DA	22	5	0.23	14	0.64	0	0
ED	29	4	0.14	16	0.55	0	0
EM	24	2	0.08	19	0.79	0	0
EV	21	3	0.14	10	0.48	0	0
FR	29	8	0.28	17	0.59	1	0.03
HL	31	6	0.19	19	0.61	1	0.03
KL	32	6	0.19	16	0.50	0	0
KD	19	2	0.11	8	0.42	0	0
LI	34	9	0.26	20	0.59	7	0.21
LB	24	6	0.25	12	0.50	0	0
LO	20	3	0.15	15	0.75	0	0
LU	22	3	0.14	18	0.82	0	0
PA	28	3	0.11	18	0.64	7	0.25
PE	29	5	0.17	11	0.38	0	0
Q	21	4	0.19	12	0.57	0	0
RE	31	14	0.45	23	0.74	3	0.10
SO	30	4	0.13	21	0.70	8	0.27

Table S3 – Results of Post-hoc GLMMs on the effects of visitor number on yawning. Significant results are shown in bold.

Categories of visitor numbers contained in the GLMM	F value (df)	p value
<b>Low and Medium visitor numbers</b>	<b>8.13 (1, 402)</b>	<b>0.005</b>
Medium and High visitor numbers	1.65 (1,247),	0.200
Low and High visitor numbers	0.62 (1,293)	0.433

Figure S4 - Bar graphs showing the proportion of focal samples where R/R occurred for each of the years from 2009 to 2015 for each of the BB individuals present in the group during the whole of that time period. Illustrated are the proportions for a) Rene, b) Frek, c) Paul, d) Heleen, e) Lianne, f) Pearl, g) Eva, h) Edith and i) Sophie.

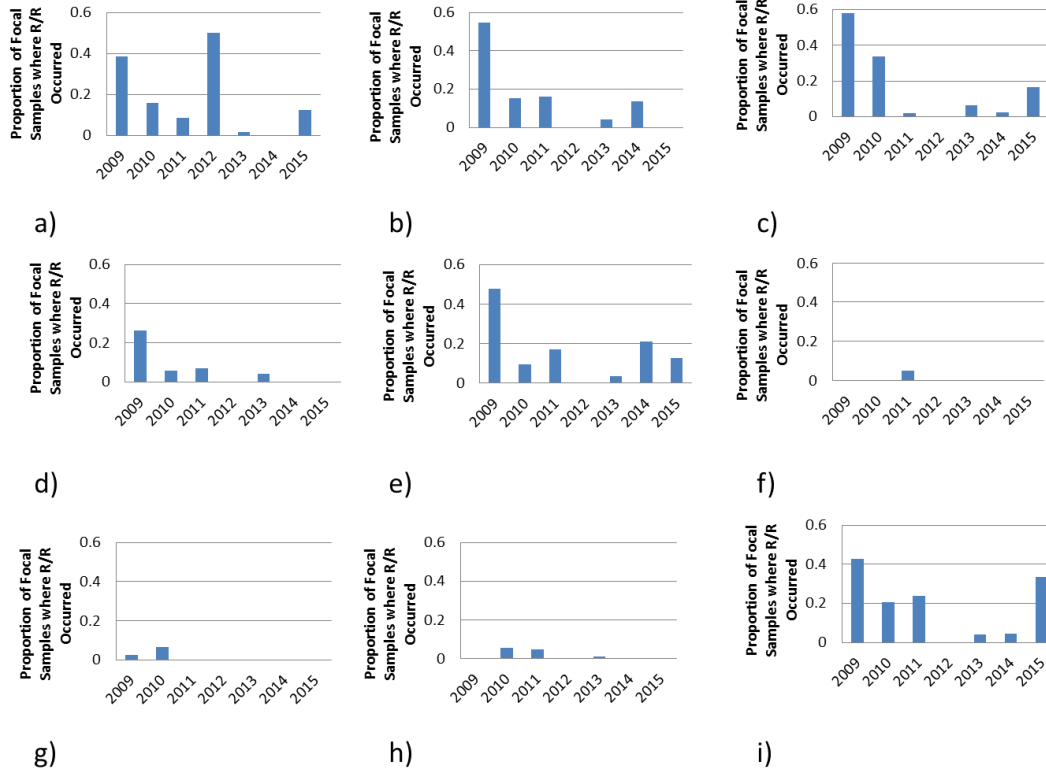


Table S5 – Number of focal samples where each of the EZ individuals were observed engaging in R/R and the number of focal samples collected on each individual between July 2010 and February 2015

ID	Total number of focal samples where EZ	Total number of focal samples recorded
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individuals were recorded		
engaging in R/R		
Ricky	1	86
Qafzeh	2	176
Kindia	2	193
Louis	1	173
Liberius	0	204
David	4	171
Emma	1	180
Lucy	0	182
Lyndsey	3	90
Cindy	2	202
Kilimi	2	192

Figure S6 – R/R events by the EZ individuals per month, from the first recorded instances of R/R by an EZ chimpanzee to the last recorded instance, with the number of hours of focal sampling during that month in brackets

