Sex-specific determinants of fitness in a social mammal

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Appendix E – Effects of group size, composition and stability on lifetime reproductive success (LRS) and its component in dominant Alpine marmot - Results obtained with two-sex models

Table E1: Effects of group size (a) and group composition and stability (b) on lifetime reproductive success (LRS) of male ($N = 52$) and female ($N = 39$) Alpine marmots followed in the Grande Sassière nature reserve (French Alps) between 1990 and 2010. The two-way interactions involving sex are statistically significant which thus support our approach of performing sex-specific analyses.

(a) Effect of group size on LRS

	Model terms	$\beta \pm SE$	z	P-value
LRS	Sex	2.11 ± 1.45	1.46	0.15
	Group size	1.96 ± 0.46	4.26	< 0.001
	Group size^2	-0.17 ± 0.04	-3.87	< 0.001
	Group size * Sex	-0.97 ± 0.57	-1.69	0.09
	Group size^2 * Sex	0.10 ± 0.05	1.95	0.05

(b) Effect of group composition and instability on LRS

	Model terms	$\beta \pm SE$	z	P-Value
LRS	Sex	-0.09 ± 0.40	-0.22	0.83
	Av. nb. partner changes	-1.69 ± 0.69	-2.44	0.01
	Av. nb. subordinate males	1.72 ± 0.31	5.51	< 0.001
	Av. nb. subordinate males^2	-0.36 ± 0.08	-4.60	< 0.001
	Av. nb. subordinate females	-0.27 ± 0.13	-2.13	0.03
	Av. nb. partner changes * sex	0.50 ± 0.86	0.58	0.56
	Av. nb. subordinate males * Sex	-1.05 ± 0.40	-2.64	0.008
	Av. nb. subordinate males^2*sex	0.24 ± 0.09	2.55	0.01
	Av. nb. subordinate females * sex	0.87 ± 0.18	4.72	< 0.001

β : estimated parameters, SE: strandard error? Abbreviations: Av.: average, Nb.: number.

Table E2: Comparison of the effects of group size (a) and group composition and instability (b) on the lifetime reproductive success (LRS) of male ($N = 52$) and female ($N = 39$) Alpine marmots estimated with the two-sex (M1) and single-sex (M2) models. The estimated parameters from models with interaction terms are the same as with a sex-specific modelling.

(a) Effect of group size on LRS

Model terms	Males		Females	
	$\beta \pm SE$ (M1)	$\beta \pm SE$ (M2)	$\beta \pm SE$ (M1)	$\beta \pm SE$ (M2)
Group size	1.97 ± 0.49	1.98 ± 0.47	0.98 ± 0.39	0.99 ± 0.34
Group size^2	-0.17 ± 0.05	-0.17 ± 0.05	-0.07 ± 0.03	-0.07 ± 0.03

(b) Effect of group composition and instability on LRS

Model terms	Males		Females	
	$\beta \pm SE$ (M1)	$\beta \pm SE$ (M2)	$\beta \pm SE$(M1)	$\beta \pm SE$ (M2)
Av. nb. partner changes	-1.17 ± 0.45	-1.68 ± 0.74	-1.20 ± 0.46	-1.03 ± 0.43
Av. nb. subordinate males	1.71 ± 0.36	1.78 ± 0.33	0.51 ± 0.29	0.58 ± 0.21
Av. nb. subordinate males^2	-0.35 ± 0.09	-0.37 ± 0.08	-0.09 ± 0.06	-0.10 ± 0.04
Av. nb. subordinate females	-0.25 ± 0.15	-0.28 ± 0.14	1.65 ± 0.50	1.58 ± 0.37
Av. nb. subordinate females^2	-	-	-0.38 ± 0.18	-0.36 ± 0.12

β : estimated parameters. SE: strandard error, Abbreviations: Av.: average, nb.: number.