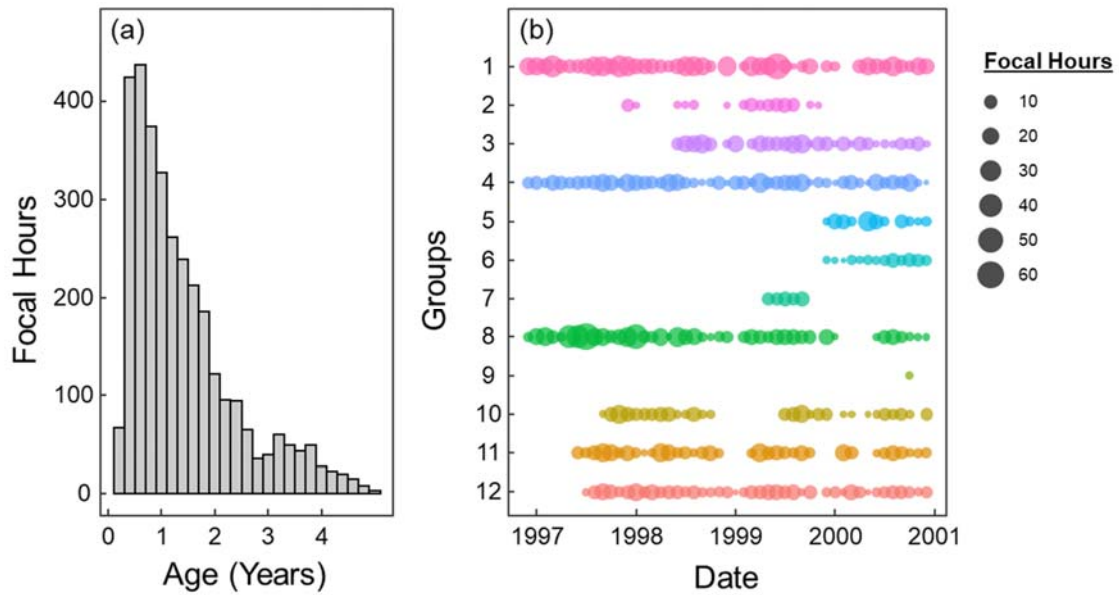


**Supplementary Material**



**Figure S1.** Visualization of the spread of focals over different ages (a) and for different groups across the duration of the study (b). For the plot of group coverage (b), each point represents a calendar month the group was focused in, and the size of the point indicates the number of hours of focal observation that group received in the month.

**Table S1**

Ethogram of behaviours recorded in focal follows

Code	Behaviour	Description
AG	Allogrooming	Grooming another individual, may be reciprocated
BO	Below ground	Focal individual is below ground
DO	Burrow renovation	Digging bolthole or burrow system
FO	Digging for food	Digging below surface layer for food in single location (i.e. greater than 20 cm distance from last dig) for more than 2 s
GA	Guarding	Guarding from a ground height of <10 cm
GR	Grooming	Self-grooming
GT	Raised guard	Guarding from a ground height of $\geq 10$ cm
MARK	Marking	Marking of an individual or object in the environment. Includes anal marking, rub, sniff and chew
NO	Other activity	Any behaviour not assigned in the ethogram. This includes moving between feeding sites, visual scanning and scratching for prey within the top surface layer
PAUSE	Pause	Focal is paused due to disruption, focal individual out of sight or focal individual on guard for more than 2 min
PF	Play-fighting	Play-fighting with another individual
RA	Resting	Resting above ground, no digging or engagement in other behaviour
RF	Redigging for food	Resuming digging for food in the same location as prior to an interrupting behaviour
RG	Raised guard (nonfocal)	Another group member, not the focal individual, is on raised guard
TF	Termite feeding	Picking up termites from the surface. Not used for ants or ant larvae foraging just below the surface

Behaviours are organized in alphabetical order of code. FO, RF and TF behaviours were the primary behaviours of interest in this study

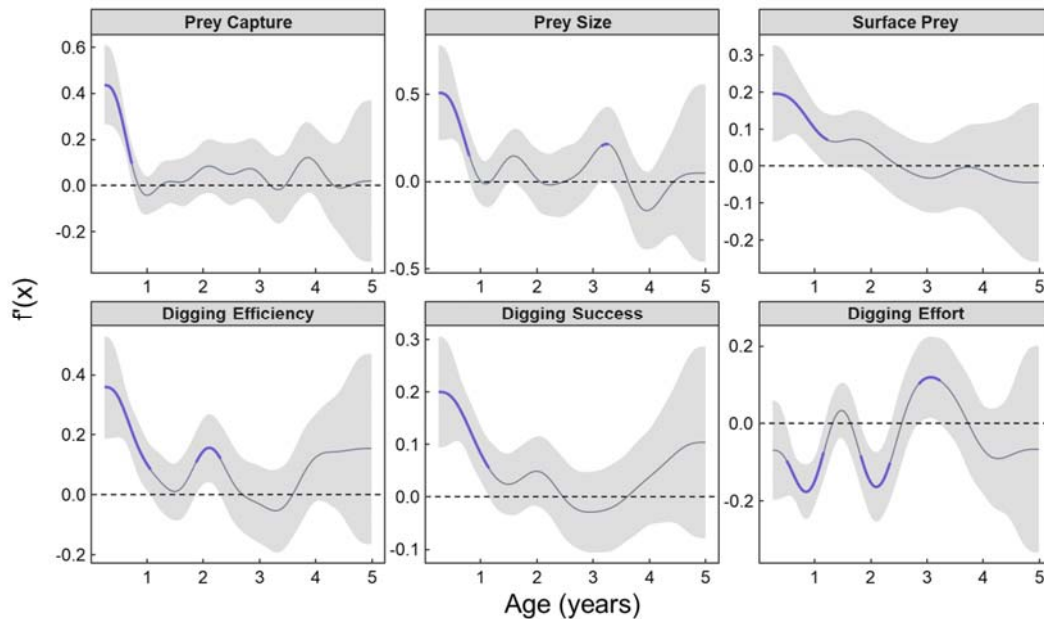
**Table S2.**

Definition of recorded prey sizes, in relation to consumption by an adult individual. Biomass approximations used by Thornton et al. (2008)

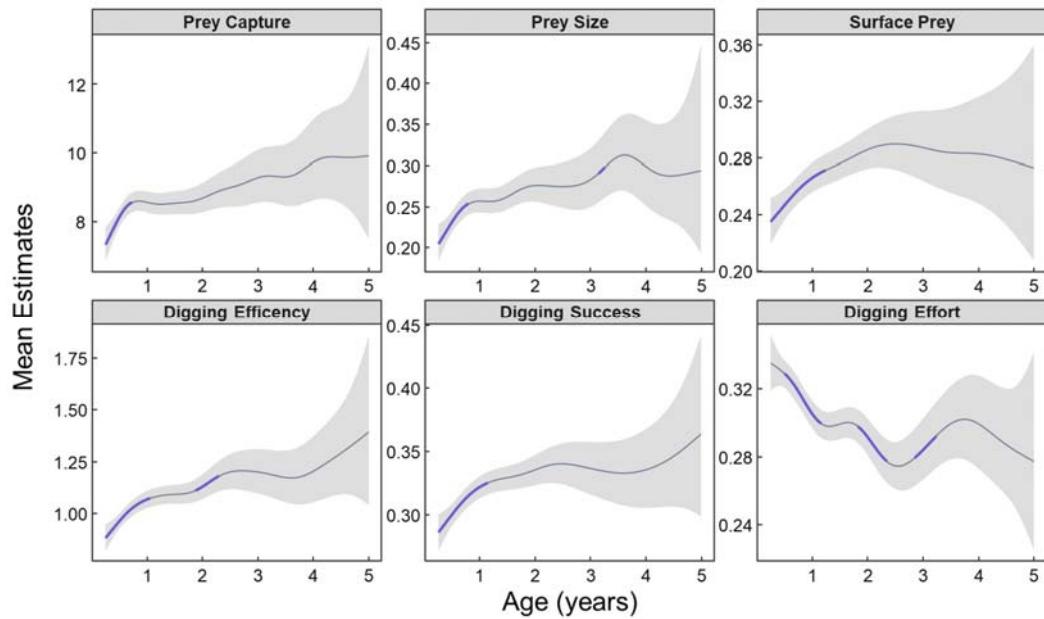
Size	Model category	Description (in relation to adult meerkat)	Biomass (mean dry weight, g)
Tiny	S	Swallowed immediately	0.05
Small	S	Item not protruding from mouth	0.11
Medium	L	Less than half of the item protruding from mouth	0.58
Large	L	Over half of the item protruding from mouth	2.86
Extra-large	L	>80% of item protrudes from mouth. Only used for large vertebrate species and millipedes	9.56

In our analyses, tiny and small as well as medium to extra-large were combined into single categories (see Table S5).

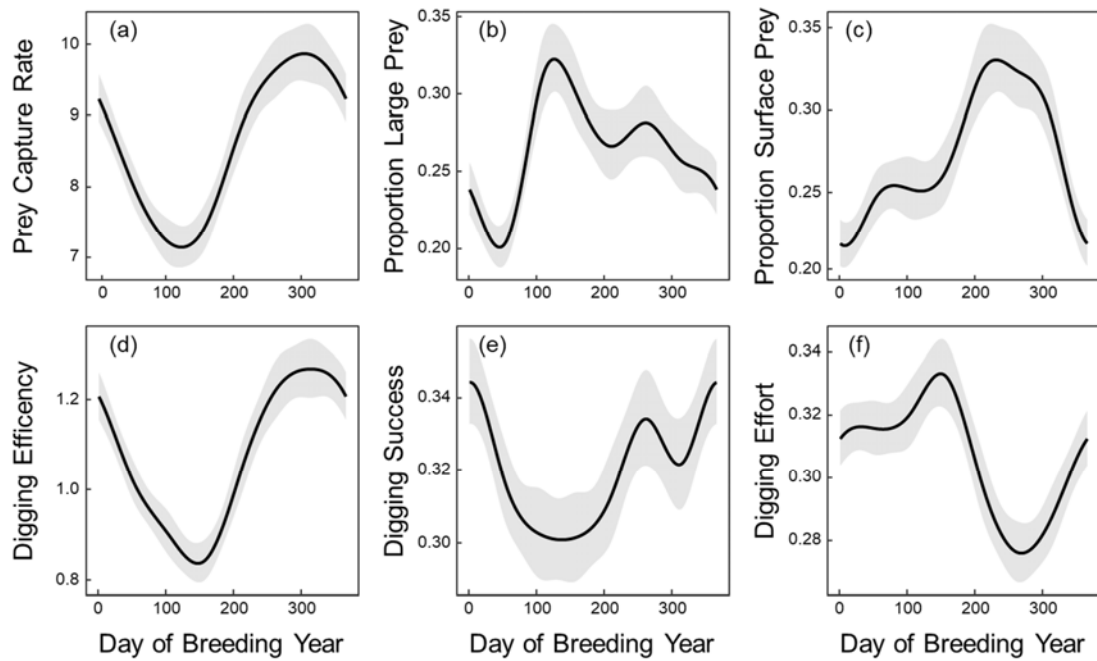
## Focal level generalized additive mixed models of foraging behaviour



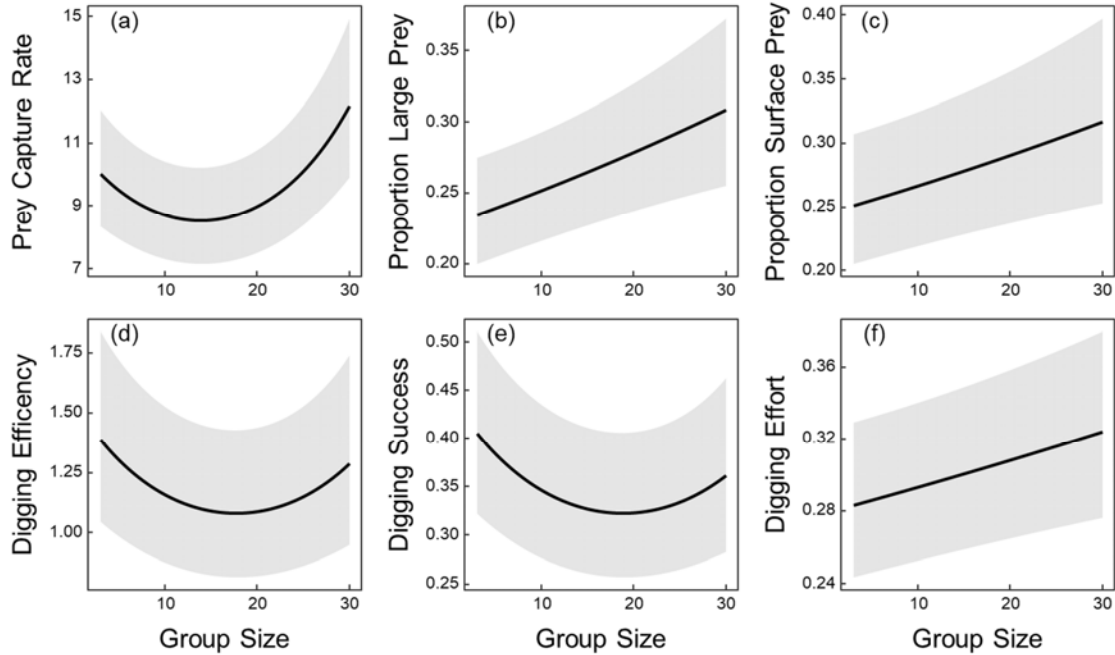
**Figure S2.** Plots of the first derivative of the age smooths from each generalized additive mixed model for the number of successful bouts per focal (prey capture), the proportion of large prey caught (prey size), the proportion of prey found on the surface (surface prey), the number of successful digs per minute digging (digging efficiency), the proportion of successful long digs per focal (digging success) and the proportion of the focal spent on long digs (digging effort). The first derivative is estimated using the method of finite differences. Periods of significant change are highlighted with thicker purple lines. Significance was determined as locations where the 95% confidence intervals do not cross zero (dashed line), which are plotted as a grey ribbon.



**Figure S3.** The population-level effect of age, across the entire range of our data, on successful bouts per focal (prey capture), the proportion of large prey caught (prey size), the proportion of prey found on the surface (surface prey), the number of successful digs per minute digging (digging efficiency), the proportion of successful long digs per focal (digging success) and the proportion of the focal spent on long digs (digging effort). Mean estimates plotted (solid lines) with 95% simultaneous confidence intervals (shaded ribbon). Periods of significant change are highlighted with thicker purple lines (Fig. S2). Estimates from generalized additive mixed models with all other smooths zeroed and covariates held at their mean or reference level.



**Figure S4.** The population-level effect of the day of breeding year (day 0 is 1 July), on successful bouts per focal (a, prey capture), the proportion of large prey caught (b, prey size), the proportion of prey found on the surface (c, surface prey), the number of successful digs per minute digging (d, digging efficiency), the proportion of successful long digs per focal (e, digging success) and the proportion of the focal spent on long digs (f, digging effort). Mean estimates plotted (solid lines) with 95% simultaneous confidence intervals (shaded ribbon). Estimates from generalized additive mixed models with all other smooths zeroed and covariates held at their mean or reference level.



**Figure S5.** The population-level effect of group size on the number of successful bouts per focal (a), the proportion of large prey caught (b), the proportion of prey found on the surface (c), the number of successful digs per minute of digging (d), the proportion of successful digs per focal (e) and the proportion of the focal spent on digs (f). Mean estimates plotted (solid lines) with 95% confidence intervals (shaded ribbon). Estimates are from generalized additive mixed models with age set to 1.5 years, all other smoothed effects zeroed and all other covariates held at their reference level. Predictions are made across the range of observed group sizes in our sample.

**Table S3.**

Output for age smooths on model residuals for the different foraging indices

Model	edf	Ref <i>df</i>	<i>F</i> statistic	<i>P</i>
Prey capture	1.000	1.000	0.038	0.846
Prey size	1.000	1.000	3.259	0.071
Surface prey	1.163	1.309	0.341	0.545
Digging efficiency	1.000	1.000	0.023	0.879
Digging success	1.000	1.000	0.150	0.698
Digging effort	1.000	1.000	0.668	0.414

edf: estimated degrees of freedom; Ref: reference.

**Table S4.**

Model outputs for prey capture rate GAMM. Model was fitted to 9919 focal follows.  
 Parametric estimates presented on the log-link scale

Parametric terms	Estimate	SE	<i>t</i> value	<i>P</i>
Group size	0.010	0.022	0.446	0.656
Group size <sup>2</sup>	0.152	0.024	6.416	<0.001
Dominance status	0.054	0.032	1.700	0.089
Sex	0.026	0.017	1.476	0.140

Smoother terms	edf	Ref <i>df.</i>	<i>F</i> statistic	<i>P</i>
s(Age)	6.775	8.097	6.253	<0.001
s(Day of breeding year)	4.807	6.000	431.916	<0.001
s(Breeding year, bs="re")	3.940	4.000	199.222	<0.001
s(Group ID, bs="re")	9.535	11.000	50.771	<0.001
s(Individual ID, bs="re")	111.275	322.000	1.167	<0.001

The reference level for the categorical fixed effects sex and dominance status were 'female' and 'dominant', respectively. Parametric effect for scaled group size presented, with scaling performed via mean centring and division by 2 SDs.

edf: estimated degrees of freedom; GAMM: generalized additive mixed mode; Ref: reference; Std.: standard.

**Table S5.**

Model outputs for prey size GAMM. Model was fitted to 9852 focal follows. Parametric estimates presented on the log-link scale

Parametric terms	Estimate	SE	<i>t</i> value	<i>P</i>
Group size	0.108	0.033	3.275	0.001
Dominance status	-0.058	0.048	-1.207	0.228
Sex	0.011	0.023	0.467	0.641

Smoother terms	edf	Ref <i>df.</i>	<i>F</i> statistic	<i>P</i>
s(Age)	6.291	7.592	7.248	<0.001
s(Day of breeding year)	5.611	6.000	50.902	<0.001
s(Breeding year, bs="re")	3.688	4.000	18.625	<0.001
s(Group ID, bs="re")	7.916	11.000	11.457	<0.001
s(Individual ID, bs="re")	40.652	322.000	0.188	<0.001

The reference level for the categorical fixed effects sex and dominance status were 'female' and 'dominant', respectively. Parametric effect for scaled group size presented, with scaling performed via mean centring and division by 2 SDs.

edf: estimated degrees of freedom; GAMM: generalized additive mixed mode; Ref: reference; Std.: standard.

**Table S6.**

Model outputs for surface prey GAMM. Model was fitted to 9852 focal follows. Parametric estimates presented on the log-link scale

Parametric terms	Estimate	SE	<i>t</i> value	<i>P</i>
Group size	0.092	0.032	2.845	0.004
Dominance status	0.008	0.044	0.183	0.855
Sex	-0.025	0.021	-1.164	0.244

Smoother terms	edf	Ref <i>df</i>	<i>F</i> statistic	<i>P</i>
s(Age)	3.512	4.381	7.634	<0.001
s(Day of breeding year)	5.390	6.000	106.983	<0.001
s(Breeding year, bs="re")	3.902	4.000	108.013	<0.001
s(Group ID, bs="re")	8.148	11.000	15.170	<0.001
s(Individual ID, bs="re")	39.694	322.000	0.178	0.003

The reference level for the categorical fixed effects sex and dominance status were 'female' and 'dominant', respectively. Parametric effect for scaled group size presented, with scaling performed via mean centring and division by 2 SDs.

edf: estimated degrees of freedom; GAMM: generalized additive mixed mode; Ref: reference; Std.: standard.

**Table S7.**

Model outputs for digging efficiency GAMM. Model was fitted to 9918 focal follows.  
 Parametric estimates presented on the log-link scale.

Parametric terms	Estimate	SE	<i>t</i> value	<i>P</i>
Group size	-0.086	0.026	-3.283	0.001
Group size <sup>2</sup>	0.130	0.028	4.667	<0.001
Dominance status	0.047	0.038	1.250	0.211
Sex	0.023	0.021	1.107	0.268

Smoother terms	edf	Ref <i>df.</i>	<i>F</i> statistic	<i>P</i>
s(Age)	5.687	6.917	12.224	<0.001
s(Day of breeding year)	5.064	6.000	518.585	<0.001
s(Breeding year, bs="re")	3.973	4.000	645.184	<0.001
s(Group ID, bs="re")	9.338	11.000	47.886	<0.001
s(Individual ID, bs="re")	113.761	322.000	1.106	<0.001

The reference level for the categorical fixed effects sex and dominance status were 'female' and 'dominant', respectively. Parametric effect for scaled group size presented, with scaling performed via mean centring and division by 2 SDs.  
 edf: estimated degrees of freedom; GAMM: generalized additive mixed mode;  
 Ref: reference; Std.: standard.

**Table S8.**

Model outputs for digging success GAMM. Model was fitted to 9918 focal follows.

Parametric estimates presented on the log-link scale

Parametric terms	Estimate	SE	<i>t</i> value	<i>P</i>
Group size	-0.089	0.020	-4.573	<0.001
Group size <sup>2</sup>	0.102	0.021	4.771	<0.001
Dominance status	-0.024	0.027	-0.878	0.380
Sex	0.010	0.015	0.669	0.503

Smoother terms	edf	Ref <i>df</i>	<i>F</i> statistic	<i>P</i>
s(Age)	4.682	5.772	10.178	<0.001
s(Day of breeding year)	5.161	6.000	64.561	<0.001
s(Breeding year, bs="re")	3.978	4.000	1194.719	<0.001
s(Group ID, bs="re")	9.050	11.000	34.122	<0.001
s(Individual ID, bs="re")	96.237	322.000	1.123	<0.001

The reference level for the categorical fixed effects sex and dominance status were ‘female’ and ‘dominant’, respectively. Parametric effect for scaled group size presented, with scaling performed via mean centring and division by 2 SDs.

edf: estimated degrees of freedom; GAMM: generalized additive mixed mode; Ref: reference; Std.: standard.

**Table S9.**

Model outputs for digging effort GAMM. Model was fitted to 9919 Focal follows. Parametric estimates presented on the log-link scale

Parametric terms	Estimate	SE	<i>t</i> value	<i>P</i>
Group size	0.053	0.016	3.279	0.001
Dominance status	-0.012	0.024	-0.508	0.612
Sex	0.014	0.013	1.066	0.286

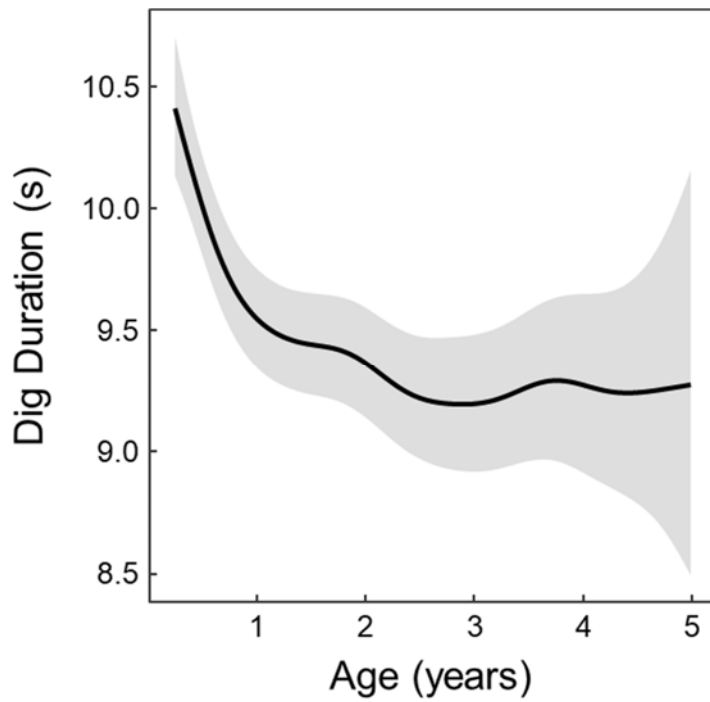
  

Smoother terms	edf	Ref <i>df</i>	<i>F</i> statistic	<i>P</i>
s(Age)	6.881	8.197	13.419	<0.001
s(Day of breeding year)	5.040	6.000	185.426	<0.001
s(Breeding year, bs="re")	3.959	4.000	380.958	<0.001
s(Group ID, bs="re")	9.287	11.000	30.067	<0.001
s(Individual ID, bs="re")	120.910	322.000	1.187	<0.001

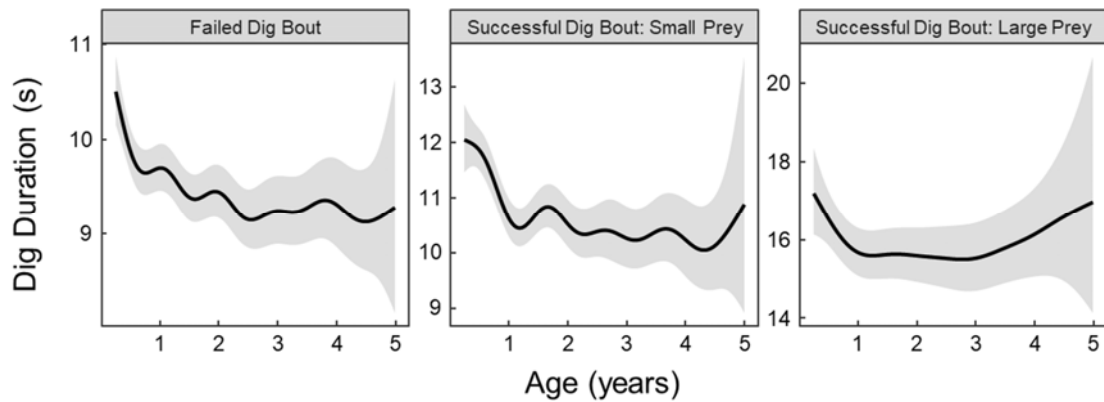
The reference level for the categorical fixed effects sex and dominance status were 'female' and 'dominant', respectively. Parametric effect for scaled group size presented, with scaling performed via mean centring and division by 2 SDs.

edf: estimated degrees of freedom; GAMM: generalized additive mixed mode; Ref: reference; Std.: standard.

**Generalized additive mixed models of digging bout duration**



**Figure S6.** The population-level effect of age on the duration of dig bouts. Mean estimates plotted (solid lines) with 95% simultaneous confidence intervals (shaded ribbon). Estimates from generalized additive mixed models with all other smooths zeroed and covariates held at their mean or reference level.



**Figure S7.** The population-level effect of age on the duration of long digging bouts in relation to whether they were a failed dig or resulted in the successful capture of small or large prey. Mean estimates plotted (solid lines) with 95% simultaneous confidence intervals (shaded ribbon). Estimates from generalized additive mixed models with all other smooths zeroed and covariates held at their mean or reference level.

**Table S10.**

Model outputs for dig bout duration GAMM. Model was fitted to 205 376 dig bouts.

Parametric estimates presented on the box-cox transformed scale ( $\lambda = -0.424$ ).

Parametric terms	Estimate	SE	<i>t</i> value	<i>P</i>
Group size	0.002	0.003	0.625	0.532
Prey category				
Small	0.045	0.002	19.788	<0.001
Large	0.181	0.003	59.534	<0.001
Smoother terms	edf	Ref <i>df</i>	<i>F</i> statistic	<i>P</i>
s(Age, by="prey category):				
Failed	8.097	8.872	9.859	<0.001
s(Age, by="prey category): small	8.066	9.100	16.774	<0.001
s(Age, by="prey category): large	3.967	4.793	3.097	0.007
s(Day of breeding year)	5.359	6.000	2979.942	<0.001
s(Breeding year, bs="re")	3.911	4.000	1552.266	<0.001
s(Group ID, bs="re")	9.279	11.000	526.532	<0.001
s(Individual ID, bs="re")	114.703	323.000	5.794	<0.001
s(Focal ID, bs="re")	6040.703	9915.000	1.900	<0.001

Prey category represents whether the dig bout failed to capture prey, captured a small sized prey or captured a large sized prey, and the reference level was failed. Parametric effect for scaled group size presented, with scaling performed via mean centring and division by 2 SDs. edf: estimated degrees of freedom; GAMM: generalized additive mixed mode; Ref: reference; Std.: standard.

## **Generalized additive mixed models of prey composition**

**Table S11.**

Smoothed effect outputs for GAMMs of diet composition. Models were fitted to 9852 focal follows. Each prey type was fitted as a separate GAMM, with the proportion of prey caught in the focal of that specific prey type fitted as the response variable

Smoothen terms	edf	Ref <i>df</i>	<i>F</i> statistic	<i>P</i>
<u>s(Age)</u>				
Larvae	4.845	5.941	3.243	0.003
Beetles	4.915	6.025	8.998	<0.001
Ants/termites	1.000	1.000	0.002	0.970
Pupae	6.354	7.632	1.672	0.068
Scorpions	3.182	3.963	4.210	0.002
Vertebrates	5.528	6.744	10.394	<0.001
Invertebrates	2.271	2.819	1.313	0.343
Unidentified	1.000	1.000	3.729	0.053
<u>s(Day of breeding year)</u>				
Larvae	5.675	6.000	252.941	<0.001
Beetles	5.160	6.000	64.882	<0.001
Ants/termites	5.912	6.000	766.364	<0.001
Pupae	5.633	6.000	223.817	<0.001
Scorpions	4.870	6.000	71.257	<0.001
Vertebrates	3.467	6.000	14.472	<0.001
Invertebrates	4.052	6.000	5.153	0.003
Unidentified	5.547	6.000	388.897	<0.001

edf: estimated degrees of freedom; GAMM: generalized additive mixed mode; Ref: reference; Std.: standard.

**Outputs for monomolecular growth curves**

**Table S12.**

Model outputs for growth monomolecular growth curves of body mass and front-claw length

Parameter	Mean	SE
Body mass (kg)		
<i>A</i>	0.7160	0.004
<i>K<sub>0</sub></i>	0.0069	0
<i>K<sub>1</sub></i>	0.0056	0
<i>t<sub>0</sub></i>	-4.6100	0.349
Front claw (mm)		
<i>A</i>	12.840	0.042
<i>K</i>	0.331	0.020
<i>t<sub>0</sub></i>	-1.410	0.272

*A* represents asymptotic mass, *t<sub>0</sub>* is the age at the onset of growth and *K* is the growth rate constant. For the biphasic body mass model *K<sub>0</sub>* is the growth rate prior to 90 days of age, and *K<sub>1</sub>* is the growth after.