Leg Length vs Nest Size with sex and instar as numeric

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AIC Values of all possible models with instar always included

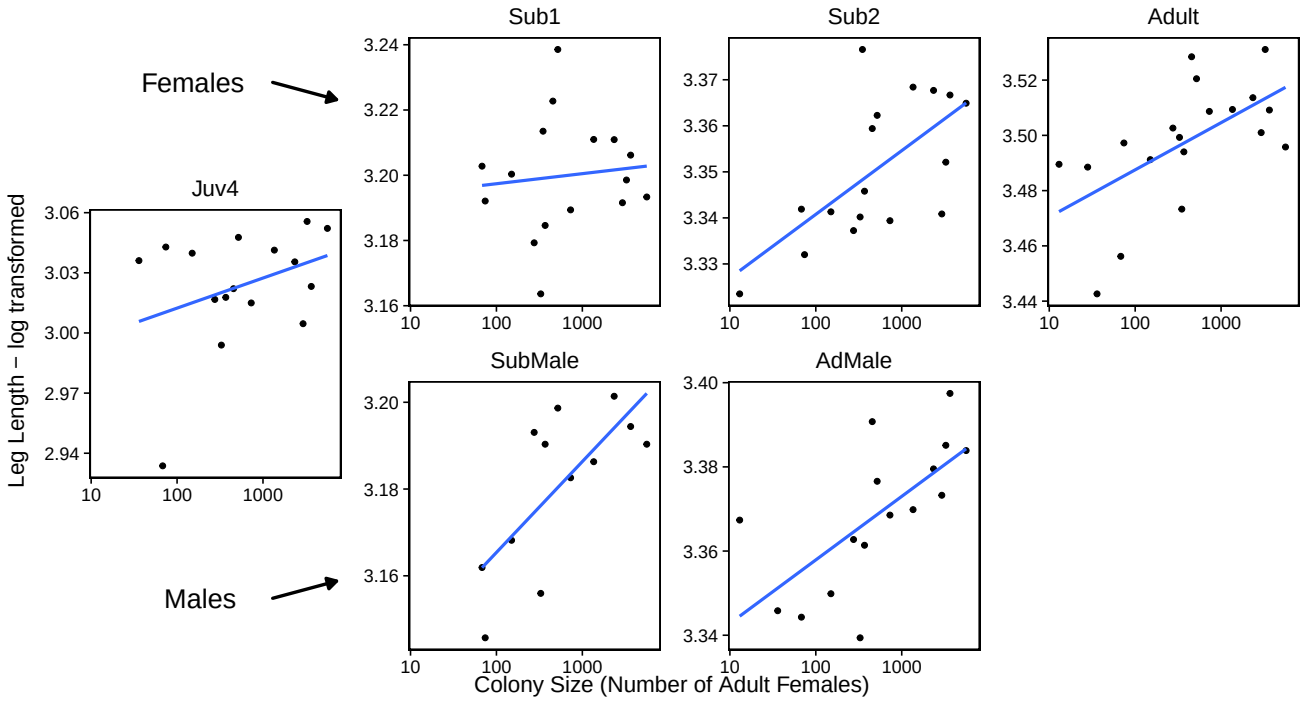
AIC_Diff	AIC	model	num.predictors
0	-5254	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	9
0.23	-5253	logLeg ~ logCtFm + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	9
0.66	-5253	logLeg ~ logCtFm + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	8
1.37	-5252	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	10
3.85	-5250	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	9
22.01	-5232	logLeg ~ logCtFm + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	8
22.61	-5231	logLeg ~ logCtFm + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	7
27.23	-5226	logLeg ~ logCtFm + logCtFm:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	8
29.26	-5224	logLeg ~ logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	8
29.29	-5224	logLeg ~ logCtFm + logCtFm:InstarNumber + InstarNumber + InstarSex + (1|NestID)	7
29.4	-5224	logLeg ~ logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	8
30.23	-5223	logLeg ~ InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	6
30.58	-5223	logLeg ~ logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	7
31.1	-5223	logLeg ~ logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	9
31.28	-5222	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + InstarNumber + InstarSex + (1|NestID)	8

AIC_Diff	AIC	model	num.predictors
31.28	-5222	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarNumber + InstarSex + (1|NestID)	8
32.08	-5222	logLeg ~ logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	8
47.83	-5206	logLeg ~ logCtFm + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	7
50.07	-5204	logLeg ~ logCtFm + InstarNumber + InstarSex + (1|NestID)	6
55.7	-5198	logLeg ~ logCtFm:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	7
58.74	-5195	logLeg ~ logCtFm:InstarNumber + InstarNumber + InstarSex + (1|NestID)	6
60.64	-5193	logLeg ~ logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarNumber + InstarSex + (1|NestID)	7

Graph with lowest AIC model superimposed

```
Model:
logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNum

Note: If line on graph is blue R could not plot the lmer, plotting a simple lm instead
```



Statistics

Note: There is no point testing instar number against leg length as it will vary of course, same with instar size

Full Model: logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1 | NestID)

Anova of full model alone

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
logCtFm	0.031	0.031	1	231.398	34.879	0
InstarNumber	1.085	1.085	1	1, 266.259	1, 216.733	0
InstarSex	0.030	0.030	1	1, 255.674	33.442	0
logCtFm:InstarNumber	0.015	0.015	1	1, 248.439	16.850	0.00004
InstarNumber:InstarSex	0.030	0.030	1	1, 255.066	33.724	0
logCtFm:InstarNumber:InstarSex	0.002	0.002	1	1, 257.610	2.660	0.103

Testing Individual Variables by preforming an Anova of full vs reduced model)

Three way interaction against full model. - NOT significant

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
object	9	-5,253.703	-5,207.382	2,635.852	-5,271.703			
..1	9	-5,251.046	-5,204.725	2,634.523	-5,269.046	0	0	1

Reduced Model: logLeg = logCtFm + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1 | Ne

Nest size x Instar Number against full model. - $p < 0.001$ SIGNIFICANT ***

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	7	-5,224.411	-5,188.384	2,619.205	-5,238.411			
object	9	-5,253.703	-5,207.382	2,635.852	-5,271.703	33.292	2	0.00000

Reduced Model: logLeg = logCtFm + logCtFm:InstarNumber + InstarNumber + InstarSex + (1 | NestID)

Spider Sex against full model. - $p < 0.001$ SIGNIFICANT ***

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	6	-5,203.186	-5,172.306	2,607.593	-5,215.186			
object	9	-5,253.703	-5,207.382	2,635.852	-5,271.703	56.517	3	0

Reduced Model: logLeg = logCtFm + logCtFm:InstarNumber + InstarNumber + (1 | NestID)

NestSize against full model. - $p < 0.001$ SIGNIFICANT ***

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	6	-5,223.471	-5,192.590	2,617.735	-5,235.471			
object	9	-5,253.703	-5,207.382	2,635.852	-5,271.703	36.232	3	0.00000

Reduced Model: logLeg = InstarSex:InstarNumber + InstarNumber + InstarSex + (1 | NestID)

Testing Individual Instars

As the interaction is significant testing instar individually

note: pops up saying 'refitting model(s) with ML (instead of REML)' but if make anova refit = FALSE results don't make sense

Adult

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-1496.660	-1484.952	751.3299	-1502.660	NA	NA	NA
object	4	-1503.201	-1487.591	755.6007	-1511.201	8.541558	1	0.0034713

Sub2

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-1228.262	-1217.709	617.1308	-1234.262	NA	NA	NA
object	4	-1236.919	-1222.849	622.4595	-1244.919	10.65751	1	0.0010962

Sub1

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-1112.989	-1102.042	559.4943	-1118.989	NA	NA	NA
object	4	-1111.281	-1096.685	559.6407	-1119.281	0.2927162	1	0.5884852

Juv4

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-922.1183	-911.7652	464.0592	-928.1183	NA	NA	NA
object	4	-921.5977	-907.7935	464.7988	-929.5977	1.47934	1	0.2238779

AdMale

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-547.1792	-539.1889	276.5896	-553.1792	NA	NA	NA
object	4	-556.9807	-546.3269	282.4903	-564.9807	11.80143	1	0.0005919

SubMale

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-125.0124	-120.6152	65.50620	-131.0124	NA	NA	NA
object	4	-129.7154	-123.8524	68.85769	-137.7154	6.702965	1	0.0096253