Individual Condition vs Nest Size with sex and instar as a factor

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AIC Values of all possible models with instar always included

AIC_Diff	AIC	model	num.predictors
0	-2082	condResiduals ~ logCtFm + logCtFm:Instar + Instar + (1|NestID)	14
1.48	-2081	condResiduals ~ I(logCtFm^2) + I(logCtFm^2):Instar + Instar + (1|NestID)	14
2	-2080	condResiduals ~ logCtFm + logCtFm:Instar + I(logCtFm^2) + Instar + (1|NestID)	15
2.32	-2080	condResiduals ~ logCtFm + Instar + (1|NestID)	9
2.68	-2080	condResiduals ~ I(logCtFm^2) + Instar + (1|NestID)	9
3.32	-2079	condResiduals ~ logCtFm + I(logCtFm^2) + I(logCtFm^2):Instar + Instar + (1|NestID)	15
4.18	-2078	condResiduals ~ logCtFm + I(logCtFm^2) + Instar + (1|NestID)	10
5.78	-2077	condResiduals ~ logCtFm + logCtFm:Instar + I(logCtFm^2) + I(logCtFm^2):Instar + Instar + (1|NestID)	20

Graph with lowest AIC model superimposed

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Model:
condResiduals ~ logCtFm + Instar + logCtFm:Instar + (1 | NestID)

Note: If line on graph is blue R could not plot the lmer, plotting a simple lm instead
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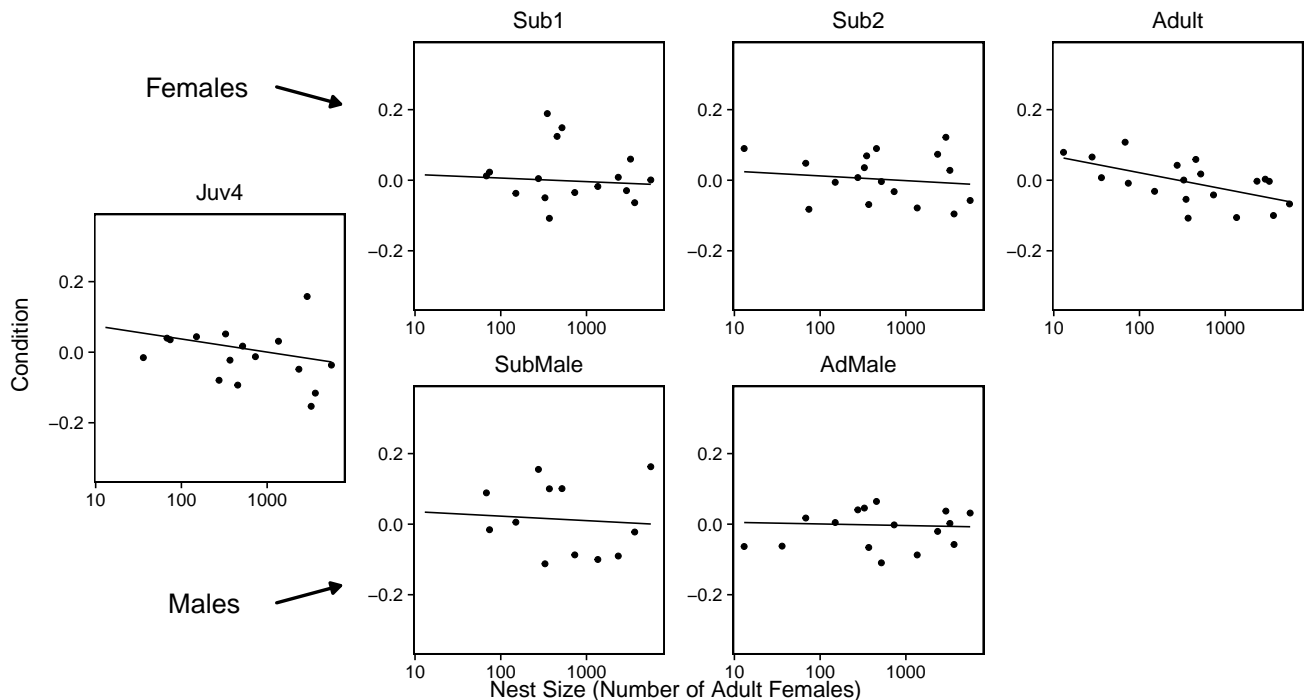
Statistics using model without squared values as the full model (Lowest AIC Model)

Full Model: condResiduals ~ logCtFm + Instar + logCtFm:Instar + (1 | NestID)

<div align="center">Anova of full model alone</div>

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
logCtFm	0.021	0.021	1	28.252	1.953	0.173
Instar	0.104	0.021	5	$1,254.228$	1.954	0.083
logCtFm:Instar	0.132	0.026	5	$1,257.281$	2.477	0.030

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

<div align="center">Testing Nest Size against full model</div>

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	8	-2,077.240	-2,036.085	1,046.620	-2,093.240			
object	14	-2,082.374	-2,010.352	1,055.187	-2,110.374	17.133	6	0.009

Reduced Model: condResiduals = Instar + (1 | NestID)

<div align="center">Testing Instar Term against full model</div>

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	4	-2,081.925	-2,061.348	1,044.963	-2,089.925			
object	14	-2,082.374	-2,010.352	1,055.187	-2,110.374	20.448	10	0.025

Reduced Model: condResiduals = logCtFm + (1 | NestID)

<div align="center">Testing Interaction Term against full model</div>

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	9	-2,080.052	-2,033.753	1,049.026	-2,098.052			
object	14	-2,082.374	-2,010.352	1,055.187	-2,110.374	12.322	5	0.031

Reduced Model: condResiduals = logCtFm + Instar + (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	-764.8555	-753.1558	385.4278	-770.8555	NA	NA	NA
object	4	-770.4985	-754.8989	389.2492	-778.4985	7.642948	1	0.0056995

Sub2

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-346.0882	-335.5359	176.0441	-352.0882	NA	NA	NA
object	4	-344.5367	-330.4669	176.2683	-352.5367	0.4484218	1	0.5030854

Sub1

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-415.8428	-404.9064	210.9214	-421.8428	NA	NA	NA
object	4	-413.9760	-399.3942	210.9880	-421.9760	0.133194	1	0.7151432

Juv4

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-338.6935	-328.3403	172.3467	-344.6935	NA	NA	NA
object	4	-337.8281	-324.0239	172.9140	-345.8281	1.134603	1	0.2867956

AdMale

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-293.6775	-285.7156	149.8387	-299.6775	NA	NA	NA
object	4	-291.8605	-281.2447	149.9303	-299.8605	0.1830181	1	0.6687923

SubMale

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-43.29431	-38.89711	24.64716	-49.29431	NA	NA	NA
object	4	-41.88070	-36.01776	24.94035	-49.88070	0.5863867	1	0.4438198