

## Juvenile proportion linear models

## Mixed models, nested random effects

- ▶ Model 2: `propjuv ~ Breeding_year + winter_month + zone + (1|Food_type/Observer/flocksize)`
- ▶ Model 3: `propjuv ~ Breeding_year + winter_month + zone + Breeding_year*zone + Breeding_year*winter_month + winter_month*zone + (1|Observer/Food_type/flocksize)`

## Predictor significance, GLMM 2

```
## Analysis of Deviance Table (Type II Wald chisquare tests)
##
## Response: propjuv
##           Chisq Df Pr(>Chisq)
## Breeding_year 13.0613  1 0.0003015 ***
## winter_month  11.2007  1 0.0008177 ***
## zone          8.6578  4 0.0702470 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

## Predictor significance, GLMM 3

```
## Analysis of Deviance Table (Type II Wald chisquare tests)
##
## Response: propjuv
##
```

	Chisq	Df	Pr(>Chisq)	
## Breeding_year	9.6718	1	0.001871	**
## winter_month	6.7530	1	0.009359	**
## zone	2.1310	4	0.711684	
## Breeding_year:zone	5.8812	4	0.208200	
## Breeding_year:winter_month	3.4035	1	0.065057	.
## winter_month:zone	3.4479	4	0.485839	

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

## Variance explained

- ▶ Using a metric,  $\Omega^2$  similar to  $R^2$
- ▶ Model 2  $\Omega^2$  : 25.4836656
- ▶ Model 3  $\Omega^2$  : 29.2668365
- ▶ Models do not explain much variance. Random effects not justified.

## Predictor significance, GLM 1

```
## Analysis of Deviance Table (Type II tests)
##
## Response: propjuv
##
```

	LR	Chisq	Df	Pr(>Chisq)
## Breeding_year	5.0773	1		0.02424 *
## zone	1.9820	4		0.73908
## winter_month	1.0510	1		0.30528
## Breeding_year:zone	2.5281	4		0.63961
## Breeding_year:winter_month	0.6394	1		0.42394
## zone:winter_month	0.3677	4		0.98503
## Breeding_year:zone:winter_month	0.3941	4		0.98296

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

## Predictor significance, GLM 2

```
## Analysis of Deviance Table (Type II tests)
##
## Response: propjuv
##           LR Chisq Df Pr(>Chisq)
## Breeding_year   4.9508  1    0.02608 *
## zone            2.2210  4    0.69518
## winter_month    0.8072  1    0.36895
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

## Comparing linear models

```
## Analysis of Deviance Table
##
## Model 1: propjuv ~ Breeding_year * zone * winter_month
## Model 2: propjuv ~ Breeding_year + zone + winter_month
##   Resid. Df Resid. Dev  Df Deviance      F Pr(>F)
## 1      4648      302.63
## 2      4661      306.44 -13  -3.8064 0.2928 0.9931
```

- ▶ Model 1  $\Omega^2$ : 5.1674111
- ▶ Model 2  $\Omega^2$ : 5.2447172