

# MODEL SELECTION AND STATISTICAL SIGNIFICANCE

Reporting the Best Science



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## 1 Model Selection

- $C_p$ , AIC, BIC, (adjusted)  $R^2$
- Backward vs. Forward Selection
- Ridge Regression vs. the Lasso

## 2 Model Validation

- Cross-Validation
- Bootstrap

## 3 Statistical Significance

- The  $p$ -value Conundrum
- Effect Sizes
- Confidence Intervals
- Akaike Information Criterion (AIC)
- Bayes Factor

$C_p$  AIC, BIC, (adjusted)  $R^2$

# Backward vs. Forward Selection

# Ridge Regression vs. the Lasso

# Cross-Validation

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# The $p$ -value Conundrum



# The $p$ -value

# Effect Sizes

# Confidence Intervals

# Akaike Information Criterion (AIC)

# Bayes Factor