Section 5.2 Confidence Intervals Using Normal Distributions

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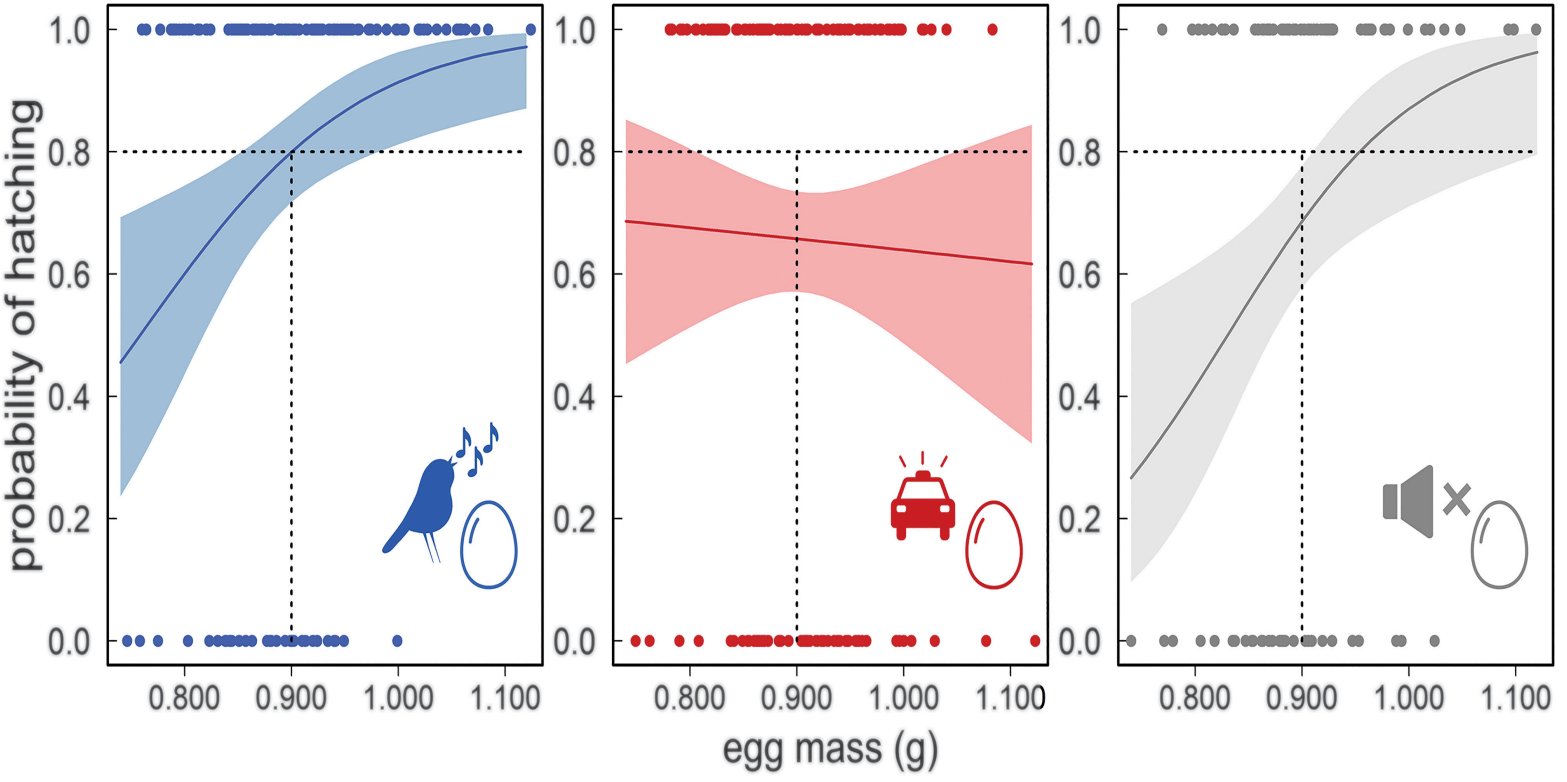
Math 261

Outline

- Confidence interval using a normal distribution

Example: Effect of prenatal sound Exposure on embronical survival in zebra finches



Confidence Intervals Using Normal Distributions

> If a bootstrap distribution is bell-shaped, a P% confidence interval can be found as the interval containing the middle P% of the normal distribution with mean equal to the observed sample statistic and standard deviation equal to the standard error of the statistic:

$$N(\text{sample statistic}, \text{SE})$$

Confidence Intervals Using the Standard Normal

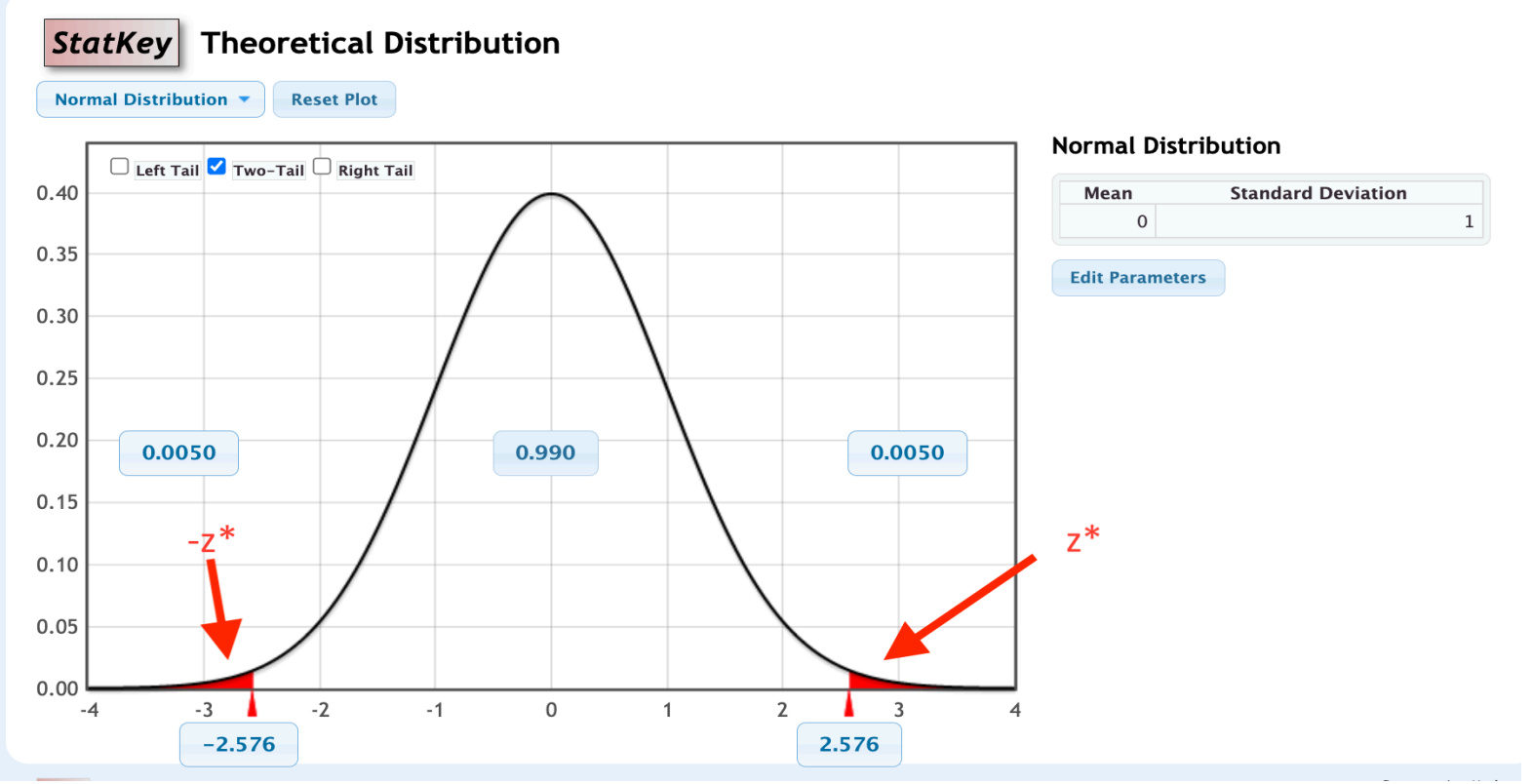
- If a statistic is normally distributed, we find a P% confidence interval for the parameter using

$$\text{statistic} \pm z^* \text{SE}$$

where z^* is the *critical value* with area P% between $-z^*$ and z^* in the standard normal distribution.

- Extends SE method to confidence levels beyond just 95%.

Use StatKey to Find the Critical Value z^*



Chap 5 Summary: General Formulas

Confidence interval

$$\text{Sample Statistic} \pm z^* \text{SE}$$

Hypothesis test statistic

$$\frac{\text{Sample statistic} - \text{Null parameter}}{\text{SE}}$$

Looking ahead

- For now, the SE comes from **resampling** methods (randomization or bootstrap).
- Beginning next class, we use classical model-based **formulas** to compute SE.