CHOOSING AN INFERENCE PROCEDURE

I. Inference On Means

A. One Sample

1. σ known

Use one-sample *z* procedures (Chapter 6)

confidence interval: $\bar{x} \pm z^* \frac{\sigma_X}{\sqrt{n}}$

test statistic: $z = \frac{\bar{x} - \mu_0}{\sigma_x / \sqrt{n}}$

2. σ unknown

Use one-sample *t* procedures (Section 7.1)

confidence interval: $\bar{x} \pm t^* \frac{s}{\sqrt{n}}$

test statistic: $t = \frac{\bar{x} - \mu_0}{s / \sqrt{n}}$

B. Two Samples

1. Dependent

Use matched pairs *t* procedures (Section 7.1)

confidence interval: $\bar{x}_d \pm t^* \frac{s_d}{\sqrt{n}}$

test statistic: $t = \frac{\bar{x}_d - \mu_{d0}}{s_d / \sqrt{n}}$

2. Independent

Use two-sample *t* procedures (Section 7.2)

confidence interval: $(\bar{x}_1 - \bar{x}_2) \pm t^* \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$

test statistic: $t = \frac{(\bar{x}_1 - \bar{x}_2)}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_1}}}$

II. Inference on Proportions

A. One Sample

Use the one-sample z procedures (Section 8.1)

confidence interval: $\tilde{p} \pm z^* \sqrt{\frac{\tilde{p}(1-\tilde{p})}{n+4}}$

test statistic: $z = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0(1-p_0)}{n}}}$

B. Two Independent Samples

Use the two-sample *z* procedures (Section 8.2)

confidence interval: $(\tilde{p}_1 - \tilde{p}_2) \pm z^* \sqrt{\frac{\tilde{p}_1(1-\tilde{p}_1)}{n_1+2} + \frac{\tilde{p}_2(1-\tilde{p}_2)}{n_2+2}}$

test statistic: $z = \frac{(\hat{p}_1 - \hat{p}_2)}{\sqrt{\hat{p}(1-\hat{p})\left[\frac{1}{n_1} + \frac{1}{n_2}\right]}}$

C. k Samples

Use the χ^2 procedures (Chapter 9)

test statistic: $X^2 = \sum \frac{(\text{obs} - \text{exp})^2}{\text{exp}}$