

8. Inference for Categorical Data: Chi-Square

Starter Quiz · 课前小测

AP Statistics

Name: _____ Score: _____

1. Chi-square tests are designed for which kind of data?

- ☐ categorical counts
- ☐ measured means
- ☐ a single proportion only
- ☐ continuous data

2. A fair die is rolled 60 times. What is the expected count for each face ($60 \times 1/6$)?

3. One category has observed 8, expected 10. Compute $(\text{observed} - \text{expected})^2 / \text{expected}$.

4. Row total 60, column total 50, grand total 100. Find the expected count ($\text{row} \cdot \text{col} / \text{grand}$).

5. You sample 100 boys and 100 girls SEPARATELY and compare favorite subject. This is a test of...

- ☐ homogeneity
- ☐ independence
- ☐ goodness-of-fit
- ☐ a mean

6. With $\chi^2 = 6.0$ at $df = 1$, the p-value ≈ 0.014 . At $\alpha = 0.05$, the decision is...

- ☐ reject H_0
- ☐ fail to reject H_0
- ☐ accept H_0
- ☐ double the p-value

7. One categorical variable checked against a claimed distribution (one sample) calls for a...

- ☐ goodness-of-fit test
- ☐ test of independence
- ☐ two-sample t-test
- ☐ test of homogeneity

8. A goodness-of-fit test involves how many categorical variables?

- ☐ one
- ☐ two
- ☐ three
- ☐ none

9. For a goodness-of-fit test with 6 categories, what are the degrees of freedom?

10. For a 2×3 two-way table, what are the degrees of freedom $(r-1)(c-1)$?

AP Statistics1. **categorical counts**

Chi-square compares counts in categories.

2. **10**

$$60 \times 1/6 = 10.$$

3. **0.4**

$$(8-10)^2/10 = 4/10 = 0.4.$$

4. **30**

$$60 \times 50 / 100 = 30.$$

5. **homogeneity**

Several separate samples compared on one variable $\rightarrow$ homogeneity.

6. **reject H0**

$$0.014 \leq 0.05 \rightarrow \text{reject } H_0.$$

7. **goodness-of-fit test**

One variable vs. a distribution $\rightarrow$ goodness-of-fit.

8. **one**

GOF checks one variable against a claimed distribution.

9. **5**

$$\text{df} = \text{categories} - 1 = 6 - 1 = 5.$$

10. **2**

$$(2-1)(3-1) = 1 \times 2 = 2.$$