

Hypothesis Test for Independence

Kathleen Mittag

CALCULATORS: Casio: *fx-9750G Plus* • Casio: *CFX-9850G Series*

Student Handout

A hypothesis test is conducted when trying to find out if a claim is true or not. And if the claim is true, is it significant. The calculator makes hypothesis testing easier by performing the computations.

After inputting the data that you have for a problem, the calculator will give you a p -value. The relationship between the p -value and the given level of significance for the problem will determine your decision. If $p < \alpha$, then you will reject the null hypothesis. If $p > \alpha$, then you will fail to reject the null hypothesis.

Hypothesis testing for independence uses a contingency table format which has been entered in a matrix. The test statistic for this type of test is called a chi-square.

Problem:

Nicorette is a chewing gum designed to help people stop smoking cigarettes. Tests for adverse reactions yielded the results given in the accompanying table. At the 0.05 significance level, test the claim that the treatment (drug or placebo) is independent of the reaction (whether or not mouth or throat soreness was experienced). If you are thinking about using Nicorette as an aid to stop smoking, should you be concerned about mouth or throat soreness?

	Drug	Placebo
Mouth or throat soreness	43	35
No mouth or throat soreness	109	118

Answer: The chi square test statistic is 1.174 with the p -value = 0.27856. Since the p -value is greater than 0.05, you fail to reject the null hypothesis and conclude that there is not enough evidence to be concerned about mouth or throat soreness.

Using the Calculator

- From the main menu, press **3(MAT)**.
- With Mat A highlighted, type **2 EXE 2 EXE**
- Enter data into each cell.
- Press **EXIT** then **MENU**.
- Press **2(STAT)**.
- Press **F3(TEST)** (It does not matter if data is in lists.)
- Press **F3(CHI)**.
- With observed highlighted, press **F1(A)**.
- With **Execute** highlighted, press **F1(CALC)**.
- The answers will appear on the screen.