

1. The 1-sample t-test

Required elements: one population, one quantitative variable, a specific value for hypothesis

Example scenario:

Population: All 2-bedroom apartments in Lumpkin County

Variable: monthly rent

Research question: Is the average rent for a 2 bedroom apartment in Lumpkin County more than \$600 per month?

Hypothesis and rationale: "I predicted that the average monthly rent for a two-bedroom apartment in Lumpkin County would be higher than \$600. A college planning guide stated that students could probably share a 2-bedroom apartment off campus "for about \$600 a month." Based on casual observation, I believe that on average, this estimate is too low."

2. The matched pairs t-test

Required elements:

- a) one quantitative variable and two populations in which individuals can be matched
OR
- b) one population and two quantitative variable values for each individual

For both (a) and (b) the hypothesis is about the computed difference between the two related values

Example scenario for (a):

Populations: All canned vegetables sold at Kroger; all canned vegetables sold at Wal-Mart

Variable: price (*specifically, the **difference** in price charged for identical items at each store)

Research question: On average, are canned vegetables cheaper at Wal-Mart than at Kroger?

Hypothesis and rationale: "We predicted that on average, Wal-Mart would charge less for the same canned vegetable item. This prediction is based on the general observation that things seem to cost less at Wal-Mart."

Example scenario for (b):

Population: All NGCSU students

Variables: rating (1 – 10) of the taste of Coke; and rating (1-10) of the taste of Pepsi (*specifically, taste tests are conducted "blind" and the **difference** in ratings is computed for each participant)

Research question: On average, do NGCSU students prefer Coke over Pepsi?

Hypothesis and rationale: " We predicted that on average NGCSU students would rate Coke better in taste than Pepsi. This prediction is based on the fact that in such close proximity to Atlanta, the Coca Cola capital, Coke is often the preferred soft drink."

3. The 2-sample t-test (independent samples) Required elements: two populations, one variable

Example scenario:

Populations: 1) All current NFC football players; 2) All current AFC football players

Variable: age

Research question: Is there a significant difference between the average age of NFC players and AFC players? (by “significant” we mean statistically significant)

Hypothesis and rationale: “We predicted that there might be a difference between the average age of NFC and AFC players. In recent years, the AFC has been perceived as the stronger conference; one could theorize that on average, they have older players who are wiser and more experienced; OR one could theorize that on average, they have younger players who are in better shape and have more stamina. The purpose of this study is to determine if any such age discrepancy exists.”