

## Alternative Evidence

**Title:** "It's Like... You Know": The Use of Analogies and Heuristics in Teaching Introductory Statistical Methods

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Analogies between the United States criminal justice system and hypothesis testing are very useful to the study of statistics. How so? They make it easier to understand the logic of an abstract task that is often seen as only having deductive relevance. In this article, Professor Michael Martin created a number of criminal trial analogies to explain statistics' most common (and most commonly confusing) concepts:

### Criminal Trial Concepts

1. Defendant is innocent
2. Defendant is guilty
3. Verdict is to acquit
4. Verdict is to convict
5. Presumption of innocence
6. Conviction of an innocent person
7. Acquittal of a guilty person
8. Beyond reasonable doubt

### Hypothesis Testing Concepts

- Null hypothesis
- Alternative hypothesis
- Failure to reject the null hypothesis
- Rejection of the null hypothesis
- Assumption that the null hypothesis is true
- Type I error
- Type II error
- Fixed (small) probability of Type I error

### Questions

1. Can you explain each of these eight correspondences? Take each analogy in turn, and explain how its components are analogous. You must use the language of this course in your answers.



2. Is the distinction between accepting and failing to reject a null hypothesis a real distinction, or just semantics? Defend your answer based on what you have learned from these Exhibits.

3. Use a hobby, interest, job, or event from your own life to create your own analogy to one or more of the key hypothesis testing concepts listed in Exhibit 2.