

Module 8b – Inference in Practice

[Review Against All Odds: Unit 26](#) (Inference)

Inference in practice – one sample t-test


- IV (Categorical) – Part of a group (yes/no)
- DV (Quantitative/Continuous)
- **Research Question Examples**
 - 1. Do Mountain State graduates make more, on average than the national median annual income?
 - 2. Do babies that received prenatal care have higher birthweight, on average, than the overall average birthweight?
 - 3. Do drivers over 70 receive more traffic violations per year than the average number of traffic violations per year?
 - 4. Does Judge “A” prescribe longer sentences for misdemeanors than the overall average sentence for a misdemeanor?

Inference in practice – one sample t-test

- IV (Categorical) – Part of a group (yes/no)
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- One sample
mean comparison:

- ***z-test***


$$Z = \frac{\bar{X} - \mu}{\sigma / \sqrt{n}}$$

μ =pop mean/some standard value

\bar{x} =sample mean

n =sample size

σ = population standard deviation

One sample t-test assumptions (same as confidence intervals)

One sample t-tests require making three assumptions.

1. The data are independent observations from a ***simple random sample***.
2. The distribution of the underlying population is ***relatively normal***.
3. We know the population ***standard deviation*** (or estimate it based on the sample standard deviation)

Type One and Type Two Errors

(see page 429 of text)

		Truth about the population	
		H_0 true	H_a true
Conclusion based on sample	Reject H_0	Type I error	Correct conclusion
	Fail to reject H_0	Correct conclusion	Type II error