Chapter 16
Inference in Practice
Key Ideas

> **"[M]athematical theorems are true; statistical methods are effective when used with judgment."**
>
> **Moore, p. 387**

Be sure the "simple conditions" are satisfied when using *z*-procedures:

- Is the sample an SRS from the population of interest?
  - For more complex sampling methods, advanced methods are needed.
  - For non-probability samples (e.g., voluntary response, convenience), the *z*-procedures are inappropriate.
- Are your data contaminated by outliers?
  - Just one outlier can change $\bar{x}$ substantially. It is not appropriate, however, to omit outliers without just cause.

- Is it reasonable to assume that the population distribution is Normal?
    - The *z*-procedures are not appropriate for distributions with extreme skewness unless the sample size is very large. (How large is "large"? We'll address that later.)
- Is the population standard deviation σ known?
    - Hardly ever in practice.
    - We'll loosen this condition with some tweaking later.

Some final cautions:

- There are no absolute standards for how small a *P*-value must be for the test to be convincing.
- A test result may be **statistically significant** but not **practically significant**.
- Beware of the dangers of *snooping* and *fishing*.