

8.1 Hypothesis and Test Procedures.

— Define:

Null Hypothesis (H_0): Claim that is initially assumed to be true

Alternative Hypothesis (H_a): Contradictory to H_0 .

— Define:

If $P\text{-value} \leq \alpha$, Then H_0 will be rejected in favor of H_a .

If $P\text{-value} > \alpha$, H_0 fails to be rejected.

— Note:

- $P\text{-value}$ is a probability
- This probability is calculated assuming H_0 is true.
- Smaller $P\text{-value}$, stronger is the evidence against H_0 .

• Error in Hypothesis Testing

— Type I error: Rejecting H_0 while it is true

Type II error: Fail to reject H_0 when it is false

• Proposition:

The test procedure that rejects H_0 if $P\text{-value} \leq \alpha$ and otherwise does not reject H_0

has $P(\text{type I error}) = \alpha$.