

Review of t - and F -distributions

(Wackerly et al. Ch 7.)

Review of p -values (W et al Ch. 10).

- Def 10.2 Section 10.6 p. 513

If W is a test statistic, the p -value or attained significance level, is the smallest level of significance α for which the observed data indicate rejection of the null hyp.

So now we need to know what "level" is.

- Def 10.1 Section 10.2 p. 491

A type I error is made if H_0 is rejected when H_0 is true. The probability α of a type I error is called the level of the test.

- Statistical Test p. 490.

(4 elements)

p -value

↓

level

←

Statistical
Test

Example: We want the FDA to approve our drug that lowers blood pressure.

We do a statistical test:

Q: What is the null hypothesis H_0 ?

A: Our drug doesn't work!

Q: Wait! We believe our drug works!
otherwise why invest \$500m in clinical trials?

A: We don't necessarily believe the null hypothesis!

We put on our skeptical hat and assume it doesn't work until we get good evidence to the contrary.

Q: How do we know if our evidence is good enough!?

A: Low p -values.

Q: How low is "low enough"?

A: It depends. For publication in a psychology journal $p < 0.05$ is probably fine.

For something where lives are at stake,

maybe we need a lower number.

Q: How low?

A: It depends.