

Introduction to the t-test: t-test

Nathan Brouwer / brouwern@gmail.com / @lobrowR

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Conducting a 2-sample t-test

- We'll use the main salmon dataframe we plotted previously.
- All t-tests in R are done using the `t.test` function
- There are unfortunately a few different ways to can get `t.test` to run things for you; you might see some variation dependong on what resources you are looking at
- We'll do what is probalby the most common way, using the tilda formula notation
- This is: "response.variable ~ predictor.variable"
- Note we have to include "data = salmon" so R knows where to find the reponse and predictor variables

```
t.test(percent.surv ~ brook.trout.PRES.ABS,
       data = salmon)

##
##  Welch Two Sample t-test
##
## data:  percent.surv by brook.trout.PRES.ABS
## t = 0.94, df = 5.8, p-value = 0.4
## alternative hypothesis: true difference in means is not equal to 0
## 95 percent confidence interval:
##  -0.0674  0.1498
## sample estimates:
##  mean in group absent mean in group present
##                0.2353                0.1941
```

Saving output of t-test

We can save the output of a t test into an R object

Examining Output of a t-test

- Examine the output of the t-test. Idetinfy the following thigns
- The t-statistics
- degrees of freedom (df)
- p-value

Note that the output reports an interesting thing, a **95% confidence interval**.

Specifically, this is the **95% for the difference between the two mean values**. The means are 0.2353 and 0.1941, and their difference is 0.0412.

The **null hypothesis (Ho)** is that the **difference between the 2 means** is essentially equal to zero. 0.0412 is close to zero, and we use the t-test and confidence intervals to determine if a difference of 0.0412 could just result from random sampling error.