Problem Set 6

JP

10/8/2021

# Independent-samples t-test

1. Get the means of both groups/samples
2. Get the variances of both groups/samples
3. Get the group/sample sizes (n)
4. Get the pooled variance by getting the groups’/samples’ variances averaged
5. Get the standard error of the differences
6. Calculate the t-obtained value
7. Get the degrees of freedom
8. Get the effect size
9. Find out if the t-obtained value is statistically significant
10. Report the t-test statistic finding. Remember to include the means and standard deviations for the two groups.

# Formulas

You are conducting an experiment where you are interested in typing errors in adults. You are specifically interested in whether using a child’s typing game will help reduce the number of typing errors. You decide to split your participants into two groups, with one group getting the child’s typing game and the other getting no help typing. You decide to test these groups to see which group had less typing errors at the end of the experiment. What test are you running and is the difference statistically significant?

set.seed(093021)  
  
child\_game <- rnorm(9, mean = 10, sd = 4.7)  
no\_help <- rnorm(12, mean = 30, sd = .99)  
  
child\_game <- round(child\_game, 2)  
no\_help <- round(no\_help, 2)  
  
child\_game

## [1] 15.20 7.63 12.35 6.34 9.61 12.36 11.06 13.32 15.52

no\_help

## [1] 29.70 31.24 29.86 30.96 29.89 30.84 28.90 30.90 31.29 29.10 32.60 29.04

You are conducting an experiment where you are interested in how many useless Disney facts participants can state. You are interested in whether going to Disneyland for a day will help with Disney knowledge. You decide one group gets to go to Disneyland and the other can look online for an hour. You decide to test these groups at the end of the day to see who knows more about Disney. What test are you running and is the difference statistically significant?

set.seed(093021)  
  
land <- rnorm(6, mean = 16, sd = 2.2)  
google <- rnorm(9, mean = 18, sd = 5)  
  
land <- round(land, 2)  
google <- round(google, 2)  
  
land

## [1] 18.44 14.89 17.10 14.29 15.82 17.11

google

## [1] 19.13 21.53 23.87 16.46 24.24 17.31 22.86 17.43 22.23