

**Assignment Due (by 11:59 P.M.):** Fri 31 Aug.

**Directions:** You may discuss the exercises with other students and with the instructor, but the work you turn in must be your own. You may use software [such as SAS or GraphPad (see, for example, <http://www.graphpad.com/quickcalcs>), a calculator, or hand calculations, and you do not need to submit your code or work – just your responses to the Exercises. This assignment will be graded out of 10 points.

**Data:** 44 elementary school students were randomly assigned to one of two methods of teaching reading comprehension. Both methods were designed so that they could be delivered to individual students rather than to whole classes. Students' reading comprehension was tested before and after 3 weeks of their assigned method. Each student's comprehension change (post minus pre) is given below. Positive change indicates improved reading comprehension.

Method: Basal

1, 1.5, -2.5, -2.5, -1, -5.5, -2.5, -4.5, 0, -1, -2, -1.5, -3.5, 1, -2, -0.5, -3.5, -3.5, -2.5, -3.5, -0.5, 0

Method: DRTA

2, -1, 0, 0.5, -1.5, -1, 2, 1.5, -0.5, -1.5, 0, -0.5, 2, -0.5, 1, 4.5, 2, -1.5, 2.5, 0.5, 1.5, 1

**Exercises:**

1. (5 points) Perform a one-sample t-test to test whether the DRTA method induced any [non-zero average] reading comprehension change. Report the following (and don't worry about model assumptions for now):
  - (a) Null and alternative hypotheses
  - (b) Numeric value of the test statistic here
  - (c) Value of (or useful range for) the p-value
  - (d) Conclusion in context of these data (not just "reject" or "fail to reject" the null)
  
2. (5 points) Perform a two-sample t-test (or t-test to compare two means) to test whether the [average] reading comprehension change induced by the two methods is the same. Report the following (and don't worry about model assumptions for now):
  - (a) Null and alternative hypotheses
  - (b) Numeric value of the test statistic here
  - (c) Value of (or useful range for) the p-value
  - (d) Conclusion in context of these data (not just "reject" or "fail to reject" the null)