**Cumulative Rhome**

**Home work**

1. Effects of Heredity and Environment on IQ.

In studying the effects of heredity and environment on intelligence, it has been helpful to analyze the IQs of identical twins who were separated soon after birth. Identical twins share identical genes. By studying identical twins raised apart, we can eliminate the variable of heredity and better isolate the effects of the environment. The accompanying table shows the IQs of pairs of identical twins (older twins are *x*) raised apart (based on data from “IQs of Identical

Twins Reared Apart,” by Arthur Jensen, *Behavioral Genetics*). The sample data given here are typical of those obtained from other studies.

**a.** Find the mean and standard deviation of the sample of older twins.

**b.** Find the mean and standard deviation of the sample of younger twins.

**c.** Based on the results from parts (a) and (b), does there appear to be a difference between the means of the two populations? In exploring the association between IQs of twins, is such a comparison of the two sample means the best approach? Why or why not?

**d.** Combine all of the sample IQ scores, then use a 0.05 significance level to test the claim that the mean IQ score of twins reared apart is different from the mean IQ of 100.

**e.** Is there an association between IQs of twins who were separated soon after birth?

What method did you use? **Write a summary statement about the effect of heredity and environment on intelligence, and note that your conclusions will be based on this relatively small sample of 12 pairs of identical twins.**

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| --- |
| X(older twins ) 107 96 103 90 96 113 86 99 109 105 96 89 |
| y 111 97 116 107 99 111 85 108 102 105 100 93 |

**HOW TO DO INSTRUCTIONS**

You will need to find information about IQ and twins for your big picture topic on **page one** of this paper. The report should be one paper with a beginning middle and end. ALL parts (a-e) and the relevant numbers for each must be stated and discussed in the report. DO NOT separate the paper into parts… this is one study with many parts… therefore talk about it as one study.

**For the Excel report: All calculations for EACH STEP MUST BE done using Excel... not your calculator. Clearly label each step on your spreadsheet.**

**Step a**: find the mean and standard deviation from the older twins (you can use data analysis tool-descriptive statistics).

**Step b**: find the mean and standard deviation from the younger twins (you can use data analysis tool-descriptive statistics).

**Step c**: compare the mean and standard deviations (step A and b) of both sets of twins.

**Step d**: find the t distribution and critical values (you can use data analysis tool-T.test). Based on the results how do you feel about the hypothesis?

**Step e**: find the correlation … this is a choice on the data analysis tool pack just like “Descriptive Statistics” or “T.Test”… find it and use it for this answer here.

OR for d and e you can use the “regression” choice to get the answers to these questions in one test