JAW attempt to add effect size to Unit A – 21 July 2017

This could be added to the end of Section 2.3, right after the sub-section on Three Tests for a Linear Relationship.

No matter which test we use to check for a linear relationship, the only question such test can answer is “Do we have evidence that the relationship we are seeing between X and Y is more than what would happen simply by chance?” A test does not address the question “Even if we suppose that X and Y are related, what difference does it make?”

It might be that there is a link between X and Y, but the link is so small that we don’t really care about it in practice. The correlation coefficient, r, (and likewise, r2) gives us a measure of how tightly X and Y are related. If you take a look at the t-test formula for testing a correlation, in the box on page XXX, you can see that as n goes up, so does the magnitude of the test statistic. For a large enough sample size, even a moderate correlation, r, will give a statistically significant t-test result. Again we ask “So what? Is r large enough that anyone should care?”

For example, we might wonder whether older houses tend to be on larger lots, or on smaller lots, than newer houses. We could conduct a t-test while investigating this possible relationship within a city. For one data set, the t-test statistic is 3.4 and the p-value is 0.0006 – a highly significant relationship. But Figure 2.XX shows that the linear trend is not terribly impressive. The correlation coefficient is 0.155, which means that YearBuilt explains only about 1% of the variation in LotSize. The small p-value is due to the sample size being close to 500. With a large sample size, almost anything is statistically significant.

