## **Quick Review for Chapter 3**

How should I interpret: r	How should I interpret: $r^2$	How should I interpret: Residual plot	How should I interpret: LSRL	How should I interpret: the slope?
When I provide an LSRL, what would a complete response look like?	How can I decide on the fit of a regression line? Explain.	What happens if I have a high $r^2$ , and residual plot with a pattern?	How should I interpret the y-intercept?	Are $r$ and $r^2$ resistant? Explain. Is the LSRL resistant?
How are $r$ and $r^2$ affected by adding a constant to the data set?	What is a residual?	What is the mean of the residuals?	Read about confounded variables below (not on test!)	Read about lurking variables below . (Understand that correlation is not causation because other variables might be involved.)

**Confounding** refers to a problem that can arise in an experiment, when there is another variable that may effect the response and is in some way tied together with the factor under investigation, leaving us unable to tell which of the two variables (or perhaps some interaction) caused the observed response. For example, we plant tomatoes in a garden that's half-shaded. We test a fertilizer by putting it on the plants in the sun and apply none to the shaded plants. Months later the fertilized plants bear more and better tomatoes. Why? Well, maybe it's the fertilizer, maybe it's the sun, maybe we need both. We're unable to conclude that the fertilizer works because any effect of fertilizer is **confounded** with any effect of the extra sunshine.

**Lurking** variables are sometime referred to as "common response". That's where some other variable drives each of the two variables under investigation, making it appear that there's some association between those two variables. A common example is in the strong association between the number of firefighters who respond to a fire and the amount of damage done. One shouldn't conclude that the firefighters may be responsible for the damage; the lurking variable is the size of the fire.