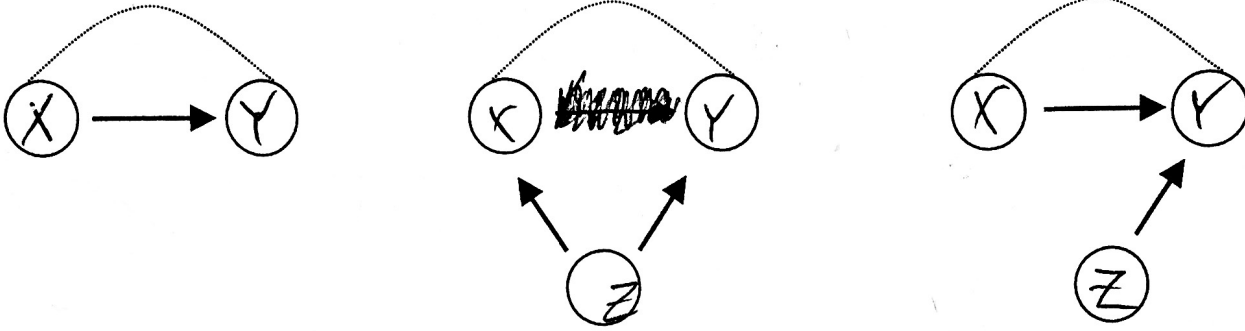


Notes – Cautions About Correlation and Regression

Extrapolation is the use of a regression line for prediction far outside the domain of values of the explanatory variable x that you used to obtain the line or curve.

Explaining Association:



Causation: Changes in x cause changes in y .

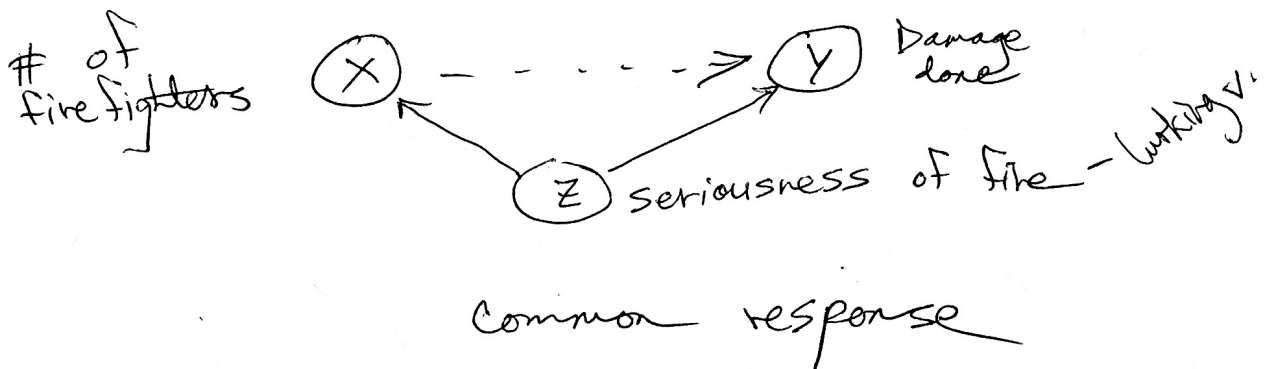
Common Response: Changes in both x and y are caused by changes in a lurking variable z .

Confounding: The effect (if any) of x on y is confounded (mixed up) with the effect of a lurking variable z .

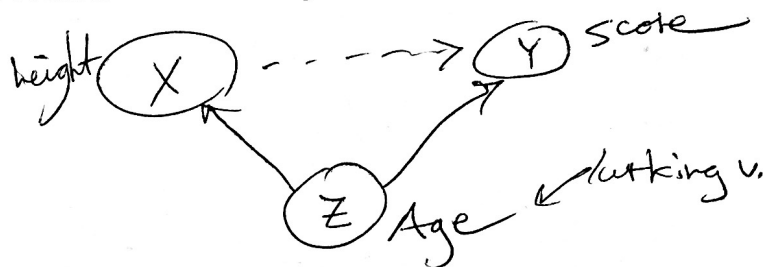
Recall: Even a very strong association between two variables is not by itself good evidence that there is a cause-and-effect link between the variables.

Ex. State whether the relationship between the two variables involves causation, common response, or confounding. Draw a diagram.

a) Someone says, "There is a strong positive correlation between the number of firefighters at a fire and the amount of damage the fire does. So sending lots of firefighters just causes more damage."



b) A study of elementary school children, ages 6 to 11, finds a high positive correlation between height (x) and score (y) on a test of mathematical concepts.



Common - response

Criteria for establishing causation when we cannot do an experiment:

- The association is strong
- The association is consistent among varied groups in varied studies
- Higher doses are associated with stronger responses
- The alleged cause precedes the effect in time *cause + effect, not effect + cause.*
- The alleged cause is plausible or backed up by outside evidence

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HW - 4.38, 4.39, 4.41, 4.42, 4.44

Read.
+ 4.3