

# SR HW 8

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8e1.

1. The third variable linking dough to rising would be heat.
2. A third variable linking education to income could be connections made while in school.
3. A third variable between gas and a car driving could be whether or not the tires are flat.

8e2.

1. The interaction would be between heat and dryness of the onions.
2. There is no interaction these are just different variables.
3. The interaction is between parents beliefs and friends beliefs that interact to predict an individuals beliefs
4. How social someone is and having manipulative appendages interact to predict intelligence.

8e3.

1.  $u_i = \alpha + (\beta_{HH_i}) + (\beta_{DD_i}) + (\beta_{DH_i})$  H is heat and D is dryness
2.  $u_i = \alpha + (\beta_{CC_i}) + (\beta_{FF_i})$  C is cylinders F is fuel injectors
3.  $u_i = \alpha + (\beta_{XPT_iP_i}) + (\beta_{XFX_iF_i})$  X is one's belief, P is Parent's belief, and F is Friend's belief
4.  $u_i = \alpha + (\beta_{SS_i}) + (\beta_{AA_i}) + (\beta_{SAS_iA_i})$  S is socialness and A is Appendages

8m1.

Water and shade interact with temperature. Temperature has an interaction effect on water and shade. Additionally, water has an impact on temperature and shade. Lastly, shade impacts temperature and water. There essentially one interaction between water, shade, and temperature. Finally, there are three two-way interactions between water/temperature, shade/temperature, and water/shade.

8m2.

water= W/temperature=T/shade=S/ bloom =B

Can you invent a regression equation that would make the bloom size zero, whenever the temperature is hot?

$$u_i = \alpha + \beta_W * W + \beta_S * S + \beta_T * T + \beta_{WS} * W * S + \beta_{WT} * W * T + \beta_{ST} * S * T + \beta_{WST} * W * S * T$$

original model

Temperature should be an indicator variable in which zero is hot. So what's left of the equation after anything multiplied by 0 would be...

$$u_i = \alpha + \beta_W * W + \beta_S * S + \beta_{WS} * W * S$$

so to get the bloom size to zero

$$\beta_{WS} = -(\alpha + \beta_W + \beta_S)$$

8m3.