Interpreting Correlation + Regression + Final Review (KS)

June 2, 2005 Lecture Notes

p. 123 #4

(H) = husband
(W) = wife

variable	mean	SD	
(H) education level (y)	12 yrs.	3 yrs.	$r = +0.5$
(W) education level (x)	12 yrs.	3 yrs.	

Question 1:

(W) has 18 yrs. of schooling

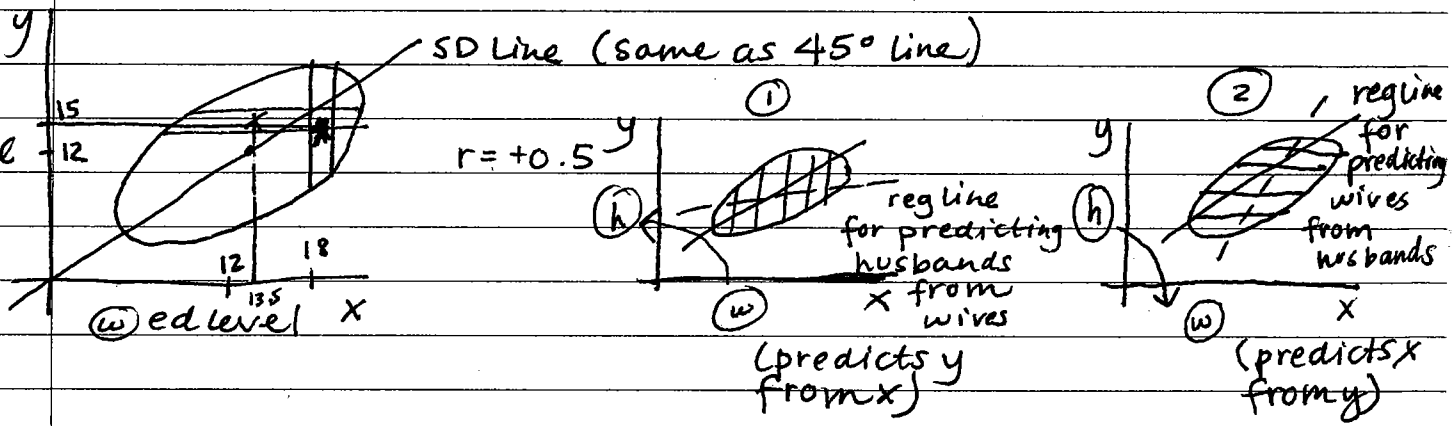
$\frac{18-12}{3}$ = 2 SD's above average for (W) → we expect her husband only is (r · 2 SD's) above average → (0.5)(2) = 1 SD

husband is 1 SD above average → predicted ed. level = 15 yrs.

Question 2:

(h) has 15 yrs. of schooling: $\frac{15-12}{3}$ = 1 SD above average

we expect his wife to be only r · 1 = (0.5)(1) SD's above average = 1.5 yrs = 13.5 years of schooling predicted for wife



Note: there are 2 regression lines in any scatterplot: one for predicting y from x + a different one for predicting x from y.

- moral: if somebody switches the role of x + y in the middle of a problem, watch out. (p. 124)

Final Review:

- correlation + regression
- probability models for sums (like escalator problem - midterm
- 2 independent samples (w/ continuous data)
- 1 sample problem w/ 0/1 data
- 2 sample paired comparison

somewhere in 1 of these problems you will be asked either to do inference or to say why doing inference would be inappropriate

Final Exam Review Problems

(5) a) x: education

y: predicted height

12 yrs. education: $\hat{y} = 66.75 + (0.25 \frac{in}{yr})(x)$ ← height, ← ed. level

$\hat{y} = 66.75 + (0.25 \frac{in}{yr})(12\ yrs)$

$= 69.75$ in

16 yrs. education: $\hat{y} = 66.75\text{ in} + (0.25 \frac{in}{yr})(16\ yrs)$

$= 70.75$ in (1 in. taller)

Q: Does going to college increase a man's height?

No - going back to college and seeing if a guy gets taller is longitudinal question but from cross-sectional data.

A1: slope came out positive + correlation came out positive because PCF = income/wealth — wealthier people can afford better nutrition so height ↑ and education ↑

A2: If we look at 2 ~~years~~ groups of men who differ on average of 1 yr. education, we can expect them on average to differ by 0.25 in. in height.

b) positive correlation probably due to better nutrition as a child → might get a raise w/elevator shoes, but simpler explanation of this correlation is PCF of nutrition

1 = Female 0 = Male

(4) a)