6104641219
Pitchaporn Inthisorn

1. Let *kids* denote the number of children ever born to a woman, and let *educ* denote years of education for the woman. A simple model relating fertility to years of education is

$$kids = \beta_0 + \beta_1 educ + u,$$

where *u* is the unobserved error.

   i. What kinds of factors are contained in *u*? Are these likely to be correlated with level of education?

   ii. Will a simple regression analysis uncover the ceteris paribus effect of education on fertility? Explain.

i Nationality.

No, it's not correlated with education.

ii No, it's not cover ceteris paribus because it's not include every factors that impacts kids.

4. The data set BWGHT contains data on births to women in the United States. Two variables of interest are the dependent variable, infant birth weight in ounces (*bwght*), and an explanatory variable, average number of cigarettes the mother smoked per day during pregnancy (*cigs*). The following simple regression was estimated using data on $n = 1{,}388$ *births*:

$$\widehat{bwght} = 119.77 - 0.514\, cigs$$

i. What is the predicted birth weight when $cigs = 0$? What about when $cigs = 20$ (one pack per day)? Comment on the difference.

ii. Does this simple regression necessarily capture a causal relationship between the child's birth weight and the mother's smoking habits? Explain.

iii. To predict a birth weight of 125 ounces, what would *cigs* have to be? Comment.

iv. The proportion of women in the sample who do not smoke while pregnant is about .85. Does this help reconcile your finding from part (iii)?

i when cigs = 0

$\widehat{bwght} = 119.77 - 0.514(0)$

$\widehat{bwght} = 119.77$

when cigs = 20

$\widehat{bwght} = 119.77 - 0.514(20)$ (10.28)

$\widehat{bwght} = 109.49$

mother that smoke 1 pack per day, the infant will weight less than infant whose mother donot smoke.

ii yes, because number of cigarettes that mother smokes has an impact on inflant's weight.

iii $125 = 119.77 - 0.514\, cigs.$

$cigs = -10.1750973$

number of cigaretl is negative, so not smoking alone cant impact inflant's weight to be 125. there must be other factor that impact inflant's weight such as diet.

iv NO

Pitchapoun Inthisorn

(6104641219)

1. Using the data in GPA2 on 4,137 college students, the following equation was estimated by OLS:

$$\widehat{colgpa} = 1.392 - .0135\, hsperc + .00148\, sat$$
$$n = 4{,}137,\ R^2 = .273,$$

where *colgpa* is measured on a four-point scale, *hsperc* is the percentile in the high school graduating class (defined so that, for example, $hsperc = 5$ means the *top* 5% of the class), and *sat* is the combined math and verbal scores on the student achievement test.

   i. Why does it make sense for the coefficient on *hsperc* to be negative?

   ii. What is the predicted college GPA when $hsperc = 20$ and $sat = 1{,}050$?

   iii. Suppose that two high school graduates, A and B, graduated in the same percentile from high school, but Student A's SAT score was 140 points higher (about one standard deviation in the sample). What is the predicted difference in college GPA for these two students? Is the difference large?

   iv. Holding *hsperc* fixed, what difference in SAT scores leads to a predicted *colgpa* difference of .50, or one-half of a grade point? Comment on your answer.

i because hsperc is the percentile in the high school graduating class if hsperc is small mean that a student is top percent in the class would generate high GPA. ,so low hsperc lead to higher colege GPA.

ii $\widehat{colgpa} = 1.392 - 0.0135\, hsperc + 0.00148\, SAT$

$= 1.392 - \underset{0.27}{0.0135(20)} + \underset{1.554}{0.00148(1050)}$

$= 2.676$

iii Suppose that

A hsperc = 1 , SAT = 1,000

B hsperc = 1 , SAT = 1,140

$\widehat{colgpa}_A = 1.392 - 0.0135(1) + 0.00148(1{,}000)$

$= 2.8585$

$\widehat{colgpa}_B = 1.392 - 0.0135(1) + 0.00148(1{,}140)$

$= 3.0657$

the difference btw 2 students is 0.2072 when SAT is 140 different.

iv $\widehat{colgpa} = 1.392 - 0.0135\ \overline{hsperc} + 0.00148\ SAT$

From iii

$3.0657 = 1.392 - 0.0135(1) + 0.00148(1,140)$

we want $\widehat{colgpa}$ to be +0.5 so

$3.5657 = 1.392 - 0.0135(1) + 0.00148(SAT)$

$SAT = 1,477.83784$

SAT score should increase by $1,477.83784 - 1,140 = 337.83784$ inorder to increase college GPA by 0.5.

answer.

2. The data in WAGE2 on working men was used to estimate the following equation:

$$\begin{aligned} \widehat{educ} &= 10.36 - .094\ sibs + .131\ meduc + .210\ feduc \\ n &= 722, R^2 = .214, \end{aligned}$$

where *educ* is years of schooling, *sibs* is number of siblings, *meduc* is mother's years of schooling, and *feduc* is father's years of schooling.

Print Preview

i. Does *sibs* have the expected effect? Explain. Holding *meduc* and *feduc* fixed, by how much does *sibs* have to increase to reduce predicted years of education by one year? (A noninteger answer is acceptable here.)

ii. Discuss the interpretation of the coefficient on *meduc*.

iii. Suppose that Man A has no siblings, and his mother and father each have 12 years of education. Man B has no siblings, and his mother and father each have 16 years of education. What is the predicted difference in years of education between B and A?

i $10 = 10.36 - .094\ sibs + .131\ meduc + .210\ feduc$

$10 = 10.36 - .094\ sibs + .131(1) + .210(1)$

$sibs = 7.457$

$9 = 10.36 - .094\ sibs + .131(1) + .210(1)$

$sibs = 18.0957$

sibs has to increase by 10.6387 in order to reduce number of schooling by 1year.

ii if mother's education is higher, number of year of education will be higher.

iii Man A

$\widehat{educ}_A = 10.36 - .094(0) + .131(12) + .210(12)$

$= 10.36 + 1.572 + 2.52$

$= 14.452$

Man B

$\widehat{educ}_B = 10.36 - .094(0) + .131(16) + .210(16)$

$= 10.36 + 2.096 + 3.36$

$= 15.816$

the difference = 1.364 years.