Chapter 2

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(1) (i) There are many factors that can explain number of children ever born to a women and they are left in u such as age of marriage, occupation, area of living, and income of family. Some factors have relationship with the level of education. To illustrate,

(ii) This simple regression analysis cannot uncover the ceteris paribus effect of education on fertility because the factors that left in unobserved error have an impact on level of education. Therefore, the regression function with only one factor can not explain the impact on the number of kids.

(4) (i) $\widehat{bwght} = 119.77 - 0.514\ cigs$

When $cigs = 0$, $\widehat{bwght} = 119.77$

$cigs = 20$, $\widehat{bwght} = 119.77 - 0.514(20) = 109.49$

The average number of cigarettes the mother smoked per day during pregnancy is negatively correlated with infant birth weight. The higher average number of cigarettes, the lower the infant birth weight. When the average number of cigarettes is 0, the birth weight of infant is 119.77 ounces. When the number of cigarettes increases to 20 (one pack per day), the birth weight is decreasing by 10.28 to 109.49 ounces.

(ii) Yes because there is nothing that is related to the average number of cigarettes left in the error term.

(iii) $cigs = \dfrac{119.77 - 125}{0.514} = -10.175$

(iv) Yes, there are 85% of the sample who do not smoke while pregnant. Therefore, the sample selected might not be appropriate to find the relationship between smoking habits of mother and infant birth weight and it causes many errors.

Chapter 3

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① (i) Because the lower number of hsperc shows that the students have good GPA when they were in high school. Therefore, the lower number of hsperc is causing the higher GPA in college and they are negatively correlated.

(ii) $\widehat{colgpa} = 1.392 - 0.0135\,hsperc + 0.00148\,sat$

hsperc = 20 and sat = 1050 ; $\widehat{colgpa} = 1.392 - 0.0135(20) + 0.00148(1050)$

$\widehat{colgpa} = 2.676$

Predicted college GPA when hsperc = 20 and sat = 1050 is 2.676

(iii) The predicted difference in college GPA is $0.00148(140) = 0.2072$.

(iv) $0.5 = 0.00148\,sat$

$\Delta sat = 337.8378$

∴ The difference of SAT score is 337.8378 that make colgpa different of 0.50.

② (i) $\widehat{educ} = 10.36 - 0.094\,sibs + 0.131\,meduc + 0.210\,feduc$

Holding meduc and feduc constant, when sibs increases by 1 unit, year of schooling is decreasing by 0.094 year.

$\Delta\widehat{educ} = -0.094\,\Delta sibs$

$\Delta sibs = \frac{-1}{-0.094} = 10.6383$

Therefore, sibs has to increase by 10.6383 that make year of schooling decrease by one year.

(ii) Coefficient of meduc is 0.131 which indicate that when mother's year of education is increasing by 1 year, it affects the children's year of schooling to increase by 0.131 year.

(iii) Man A : $\widehat{educ}_A = 10.36 - 0.094(0) + 0.131(12) + 0.210(12)$

$\widehat{educ}_A = 14.452$

Man B : $\widehat{educ}_B = 10.36 - 0.094(0) + 0.131(16) + 0.210(16)$

$\widehat{educ}_B = 15.816$

The predicted year of education of Man A is 14.452 year while Man B has predicted year of schooling of 15.816 year. The difference between two mans is 1.364 year.