→ Interpreting Categorical X

Population Regression Model

$$Y_i = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \beta_3 X_{3i} + u_i$$

Where:

Y = reading test scores

$X_1 = 0/1$ SES - 2nd Quartile

$X_2 = 0/1$ SES - 3rd Quartile

$X_3 = 0/1$ SES - 4th Quartile

} non-reference groups

reference-group = 1st Quartile

OLS Prediction Line w/o estimates

$$\hat{Y}_i = \hat{\beta}_0 + \hat{\beta}_1 X_{1i} + \hat{\beta}_2 X_{2i} + \hat{\beta}_3 X_{3i}$$

OLS Prediction Line w/ Estimates

$$\hat{Y}_i = 45.1 + (3.5 * X_{1i}) + (6.4 * X_{2i}) + (10.8 * X_{3i})$$

$\hat{\beta}_1$ = On average, being in the 2nd SES Quartile as opposed to in the 1st SES Quartile is associated with a 3.5 increase in reading test scores

$\hat{B}_2$ = On average, being in the 3rd SES Quartile as opposed to the 1st SES Quartile is associated with a 6.4 increase in reading test scores

$\hat{B}_3$ = On average, being in the 4th SES Quartile as opposed to the 1st SES Quartile is associated with a 10.8 increase in reading test scores

$\hat{Y}$ for 1st Quartile

$X_1 = \phi, X_2 = \phi, X_3 = \phi$ = $\hat{Y}_i = 45.1 + (3.5 * \phi) + (6.4 * \phi) + (10.8 * \phi)$

$\hat{Y}_i = 45.1$

$\hat{Y}$ for 4th Quartile

$X_1 = \phi, X_2 = \phi, X_3 = 1$ $\hat{Y}_i = 45.1 + (3.5 * \phi) + (6.4 * \phi) + (10.8 * 1)$

$\hat{Y}_i = 45.1 + 10.8$

$\hat{Y} = 55.9$