

6. **Success in Graduate School.** A researcher is interested in factors related to success in graduate school. Using data from a variety of sources, the researcher obtains a continuous measure of graduate school success y , the outcome of interest. In addition, the researcher has continuous measures of intellectual ability x_1 and of work ethic x_2 . All three of these variables are *standardized* to have mean zero and standard deviation 1. This means that a predictor effect β can be interpreted as the expected increase in y in standard deviation units for a 1 standard deviation increase in x . All variables are coded so that higher values are better (i.e., more success, smarter, better work ethic). The researcher fits the model

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \varepsilon_i.$$

The parameter estimates are $\hat{\beta}_0 = 0.00$, $\hat{\beta}_1 = 0.608$, $\hat{\beta}_2 = 0.614$. The p-values for testing $H_{01} : \beta_1 = 0$ versus $H_{A1} : \beta_1 \neq 0$ and for testing $H_{02} : \beta_2 = 0$ versus $H_{A2} : \beta_2 \neq 0$ are both < 0.001 . Describe the relationship between intellectual ability, work ethic, and graduate school success in language that could be used in a journal publication.