Abstract:

A longitudinal study is a study in which the researcher makes observations of the same variable on the same individual. This creates a problem of independence since the observations of one variable on one individual clearly are not independent. Therefore, we must adjust the statistical model in order to correct for this. The correction uses multivariate statistical techniques to create a variation of multiple linear regression. To demonstrate how this correction works we will provide an example using data on children’s development. The goal of the analysis is to determine which of a few factors, if any, have an effect on a child’s academic performance. We predicted that poverty level would have the greatest negative effect and breastfeeding would have the greatest positive effect. After conducting our analysis we found that over time poverty affects a child’s ability to do well in math by a coefficient of -8.54 (p = 0.0000). Breastfeeding increases their ability over time by 4.11 (p = 0.0409). Also, Reading ability turned out to have an effect over time as well at a rate of 0.3308 (p = 0.0000). Time spent with family and sleeping did not appear to have any effect.