

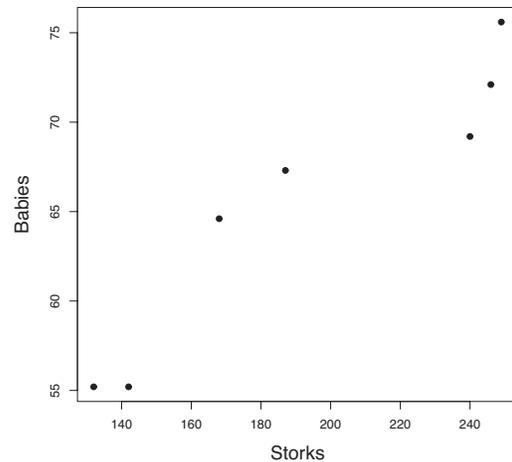
Biology: Stork Population vs. Births

If you examine the records of the city of Copenhagen for the ten or twelve years following World War II, you will find a strong positive correlation between (i) the annual number of storks nesting in the city, and (ii) the annual number of human babies born in the city. These data were researched by Dr. Gustav Fischer and subsequently published in

Ornithologische Monatsberichte, 44 No. 2, Jahrgang, 1936, Berlin *Ornithologische Monatsberichte*, 48 No. 1, Jahrgang, 1940, Berlin *Statistisches Jahrbuch Deutscher Gemeinden*, 27-33, Jahrgang, 1932-1938, Gustav Fischer, Jena.

Can we conclude that storks bring babies? Let's examine the correlation coefficient, just as Dr. Fischer has done in his published work. Visually inspecting the correlation coefficient between the dependent and independent variables, stork population and births, respectively, we can guess that the correlation coefficient is positive and near +0.85.

In this example what you have is a situation where two variables end up as correlated, not because one is influencing the other, but rather because both are influenced by a third variable, Z , that is not being taken into account. That is, the causal relationship here is not $X \rightarrow Y$ or $X \leftarrow Y$, but rather



There is a third, “lurking” variable so that the correlation between storks and babies is not so straightforward, but it is there all the same. During the ten or twelve years following World War II, the populations of most western European cities steadily grew as a result of migrations from surrounding rural areas. There was also that spurt of fecundity known as the post-war baby boom. Here is how it worked out for the city of Copenhagen, which is also home to annually fluctuating numbers of storks. As population increased, there were more people to have babies, and therefore more babies were born. Also as population increased, there was more building construction to accommodate it, which in turn provided more nesting places for storks; hence increasing numbers of storks. {taken from <http://faculty.vassar.edu/lowry/ch3pt2.html>}