Unidentified Variables of Studies

In two situations, a relationship between an explanatory variable and a response variable might be indicated by the data gathered in a study, but unidentified variables may be the underlying cause of the relationship.

In the first case, a **confounding variable** may be the true cause of the response variable. In other words, the explanatory variable may be the cause of the confounding variable, which in turn is the cause of the response variable. The explanatory variable is only associated with the response variable through the confounding variable.

![Figure 1. A confounding variable’s impact on the relationship between the explanatory variable and response variable.](image)

In the second case, a **lurking variable** may be the true cause of both the explanatory variable and response variable. Thus, the explanatory variable may be related to the confounding variable, but only because the lurking variable is impacting both variables.

![Figure 2. A lurking variable’s impact on the relationship between the explanatory variable and response variable.](image)
(Un)identified Variables of Studies

In addition to unidentified variables, characteristics of the population (sometimes known and sometimes unknown) from which a sample is drawn may influence the relationship between the explanatory variable and the response variable. A simple random sampling intends to mediate the influence of these characteristics on the relationship by random assignment of individuals. When known, a stratified random sampling intends to control the influence of the characteristics by including them in the sampling process.

Figure 3. Characteristics of the population may impact the relationship between the explanatory variable and response variable.