Controlled variables are variables that are sometimes overlooked by researchers, but it is usually far more important than the dependent or independent variables. A failure to isolate the controlled variables in any experimental design will seriously compromise the internal validity. This oversight may lead to confounding variables ruining the experiment, wasting time and resources, and damaging the researcher's reputation.

In any experimental design, a researcher will be manipulating one variable, the independent variable, and studying how that affects the dependent variables. Most experimental designs measure only one or two variables at a time. Any other factor, which could potentially influence the results, must be correctly controlled. Its effect upon the results must be standardized, or eliminated, exerting the same influence upon the different sample groups.

For example, if you were comparing cleaning products, the brand of cleaning product would be the only independent variable measured. The level of dirt and soiling, the type of dirt or stain, the temperature of the water and the time of the cleaning cycle are just some of the variables that must be the same between experiments. Failure to standardize even one of these controlled variables could cause a confounding variable and invalidate the results.

Control Groups

In many fields of science, especially biology and behavioral sciences, it is very difficult to ensure complete control, as there is a lot of scope for small variations. Biological processes are subject to natural fluctuations and chaotic rhythms. The key is to use established operationalization techniques, such as randomization and double blind experiments. These techniques will control and isolate these variables, as much as possible. If this proves difficult, a control group is used, which will give a baseline measurement for the unknown variables. Sound statistical analysis will then eliminate these fluctuations from the results. Most statistical tests have a certain error margin built in, and repetition and large sample groups will eradicate the unknown variables. There still needs to be constant monitoring and checks, but due diligence will ensure that the experiment is as accurate as is possible.

The Value of Consistency

It is important to ensure that all these possible variables are isolated, because otherwise it is impossible to distinguish the independent variables, as instead of the findings being a true reflection of the independent variable, the unknown variables will give a biased different result to the results.