Dependent variable : Measure of the behaviour we are interested in. On *y*-axis.

Independent variable: Variable manipulated by experimenter, to see if it affects DV. On *x*-axis.

Operational definition: Description of operations carried out by researcher to measure DV or to manipulate IV. Helps others to replicate study, and helps us to remain objective and avoid biasing our results.

Reliability: Whether we get the same results if we measure the same variable again under the same conditions.

Validity: Whether our variable really measures what we meant it to.

Population: All the events, scores etc we are interested in.

Sample: Representative subgroup drawn from population, preferably randomly. Used to draw conclusions about whole population.

Sampling error: Random samples drawn from the same population will give different results. Chance variation. Unavoidable, but minimised by using large samples.

Sampling bias: When a sample does not truly represent its parent population, usually because it was not drawn randomly. E.g., a minority ethnic group may be underrepresented. Avoidable by random sampling.

Observational designs: Look for correlation between two DVs (strictly, there is no IV. Some sources, like your lab manual, use IV slightly differently, to mean the variable that may cause changes in the DV. I prefer the stricter definition that it is the variable the experimenter manipulates.) Note that correlation doesn't always imply causation, so less powerful than experimental designs, but sometimes the only choice for ethical or practical reasons.

Experimental designs: Manipulate IV and observe effect on DV. Can imply causation, if effect is replicable. More powerful, but not always possible.

Confounding variable: A variable <u>other than our IV</u> which might have been responsible for any change in the DV that we observed. An alternative explanation for our results. Invalidates our experiment. Also just called **confound**.

Controlling for potential confounding variables:

Hold them constant (esp. with external confounds, such as time of day, or stimulus lists in a memory task).

Randomize them (esp. with subject confounds, such as individual differences in ability on a task).

Within-subject design: Each subject is exposed to all levels of IV (all conditions). Comparison is between each subject's performance in several conditions. Internal (subject) confounds controlled, but could be external (environmental) confounds.

Between-subjects design: Each subject only encounters one level of IV (one condition). Comparison is between average performance of groups of different subjects in each condition. External variables can be controlled, but could be subject confounds.

Matched-pairs design: Each subject is only in one experimental condition, but his/her behaviour is compared with a matched partner (according to subject confounds that might be important, like pre-existing ability at the task) in the other experimental condition. Controls both external and internal confounds. Good idea but not widely used.

Experimental group: Group that receives the intervention (e.g., a new drug).

Control group: Group that doesn't receive the intervention, but is otherwise treated identically to experimental group. Assess effect of intervention by comparing improvement of control with experimental group.

Placebo: A sham drug (e.g., a sugar pill which looks like the real pill). Given to control group in drug evaluations.

Single-blind design: Subjects don't know whether they are in experimental or control group.

Double-blind design: Experimenter who regularly interacts with subjects doesn't know which group they are in either.

Important message: Correlation does not imply causation !