

Repeated Measures

Sometimes instead of taking a single measurement of the response variable, investigators take multiple measurements of the response variable, under several different conditions. Take caution as these multiple measurements do not imply you have multiple response variables; you are only considering a single response variable but with two predictors: unit (or participant) and condition. If your multiple measurements were taken at different time intervals, then the different times you made the measurements are the levels of the condition predictor variable. An advantage of repeated measures designs is that it controls for nuisance variables by doing the various measurements on the same subjects. Below are some examples where repeated measures are taken.

Examples:

- The heart rate of 50 sprinters was taken before and after a race.
- A new drug was administered to 100 patients to reduce acne. Measurements on the proportion of skin affected by acne were taken every week for six weeks starting from the day the new drug was administered, to test the drug's effectiveness. Here individual is one nominal predictor (a random effect) and week of measurement is a second (quantitative) predictor.
- The level of oxygen in the blood of 30 swimmers was measured before and after an 800m butterfly race.
- A hundred patients with acne were each treated at different times with four different medications to see which was most effective. Here patient is the nominal random effect predictor and medication is the second (nominal fixed effect) predictor.