Designing your own experiment

1) Formulate a precise research question

Ex : does random auditing reduce tax evasion ?

Possible design :

- N subjects in a group. Each subject i receives a randomly selected income y_{it} in period t, from a known distribution (iid)
- Task = declare her income $y°_{it} \leq y_{it}$
- Income after tax is equal to $y^{\theta}_{it} = y_{it} - \theta y°_{it}$ ($0 < \theta < 1$: taxation rate)
- After declaration k < n agents are randomly chosen to be inspected : if $y°_{it} < y_{it}$ agent i has to pay taxes on undeclared income + a fine F (F might be fixed or a function of undeclared income)
- Payoffs
  - Non inspected subjects : $y^{\theta}_{it} = y_{it} - \theta\, y°_{it}$
  - Inspected subjects : $y^{\theta}_{it} = y_{it} - \theta\, y°_{it} - \theta(y_{it} - y°_{it}) - F$

2) Derive clear predictions

Ex : prediction from EU theory, Prospect-Theory (loss aversion), and other theories…

N.B. sometimes predictions are qualitative

3) Choose treatment variables

Which treatments should be included in the design ? How many treatments ? How many categories in each treatment ?

Possible treatments : audit probability (k), tax rate (θ), fine (T), population size (n), income range (y_{min} and y^{max}), time (number of periods).

Categories : ex : « high fine (T^h) vs low fine (T^l) », or « high, medium, low »

4) Choose an experimental procedure

Partner/stranger : subjects stay in the same group or are rematched during the experiment

Hot/cold : you want to elicit strategies or observe decisions

Within/Across : the same subjects play the sequence T^h ➔ T^l or the sequence T^l ➔ T^h . Each subject group plays only one treatment.

5) Define the statistical methods that will be used to analyse the data

Income declaration : does compliance increase with experience ? With T, with k etc…

Panel-data regression, or comparing group averages using non-parametric tests, ..

Some advice….before you start !

- Conceive your experiment by providing precise answers for each step together. Eventually fold back to earlier steps if some answers are unclear or if the data analysis becomes to complex.
- Simulate your data analysis before running the experiment
- Run pilots to get some insights about the treatment effect you want to isolate
- Write simple, clear and concise instructions. They must be understandable by any randomly drawn individual from the general population (above 18, except if you want to run experiments with children). Test the understanding before running the experiment
- Always check understanding by adding a questionnaire
- Collect individual data at the end of the session (gender, age, study, etc…)