

As statistical consultants, we are to assist our clients (collecting and) analyzing their data. To be an effective statistical consultant, one needs adequate technical skills, communication skills, interpersonal skills, and the right philosophy towards the role.

Data, Design, Analysis

Projects are initiated to achieve certain goals, and once the goals are set, projects involving data typically go through four phases: (i) study design, (ii) data collection, (iii) data analysis, (iv) conclusion; phase (i) could be missing if archived data are to be used. Most clients come to us after or during phase (ii), but we prefer their coming before phase (i). Occasionally, clients may come after phase (iii), to look for approval stamps or to inquire about certain computer outputs, say, in which case we should bring them back to before phase (iii).

Data analysis should be driven by **research questions** reflecting the goals of study, not by anything else such as statistical significance. We however may help the clients elucidating specifics of their research questions. We need to understand the nature of the data and hopefully grasp a bit of related sciences, then devise analytical approaches accordingly. *Do not presume models before comprehending the research questions and the data.*

Data analysis extracts pertinent information from the data but does *not* create information, and exhaustive analysis could not rescue the situation if the data contain little or contaminated information for the goals of study. Data quality is largely determined by study design, so we prefer to get involved at an early stage.

We are to help the clients addressing their research questions, not to show off our technical capabilities. If simple approaches meet the needs, do not attempt sophisticated procedures just because you can. **Simplicity is a virtue.**

Communication

Effective communication is essential to successful statistical consulting. To communicate ideas effectively, rely more on words/phrases comprehensible to the clients. On the receiving end, try to rephrase what you are told for the clients to confirm. Draw analogies.

The crucial part of our tasks is proper problem formulation, for which one needs to ask the right questions to query experimental settings, data collection/preprocessing details, and the research questions the clients wish to address.

When reporting the analysis results to the clients, do elaborate on the practical meanings in the application settings of your numerical/graphical findings.

Philosophy

We assist the clients in data analysis as equal partners, not subordinates. In fact, we often provide vital insights to help the clients sorting out logical structures in their studies, which is way more important than mere number crunching.

We seek to extract information from the data to address research questions defined by the clients. We shall honestly report our findings, positive or negative alike. We do not hunt for statistical significance.