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Qualitative research is considered to be particularly suitable for exploratory research (e.g. during the pilot stage of a research project, for example). It is primarily used to discover and gain an in-depth understanding of individual experiences, thoughts, opinions, and trends, and to dig deeper into the problem at hand.

The data collection toolkit of a qualitative researcher is quite versatile, ranging from completely unstructured to semi-structured techniques. The most commonly applied qualitative methods include individual interviews, group discussions (focus groups), and behavioral observations.

In addition, eye tracking or automatic facial expressions can be collected and analyzed qualitatively, for example in usability research, where gaze patterns (such as with heatmaps) or moments of expressions of frustration / confusion can be used to track the journey of an individual respondent within a software interface.

Typically, qualitative research focuses on individual cases and their subjective impressions. This requires an iterative study design â data collection and research questions are adjusted according to what is learned.

Often, qualitative projects are done with few respondents and are supposed to provide insights into the setting of a problem, serving as a source of inspiration to generate hypotheses for subsequent quantitative projects.

What is quantitative research?

Simply put, quantitative research is all about numbers and figures. It is used to quantify opinions, attitudes, behaviors, and other defined variables with the goal to support or refute hypotheses about a specific phenomenon, and potentially contextualize the results from the study sample in a wider population (or specific groups).

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As quantitative research explicitly specifies what is measured and how it is measured in order to uncover patterns in  $\hat{\alpha}$  for example  $\hat{\alpha}$  behavior, motivation, emotion, and cognition, quantitative data collection is considered to be much more structured than qualitative methods.

### Quantitative research techniques

Quantitative techniques typically comprise various forms of questionnaires and surveys, structured interviews as well as a behavioral observation based on explicit coding and categorization schemes.

In addition to these traditional techniques, biosensor recordings such as eye tracking, EEG, EDA / GSR, EMG, and ECG as well as computer-guided automatic facial expression analysis procedures are used.

All of these quantify the behavioral processes in such a way that numerical results can be obtained  $\hat{\alpha}$  for example, fixation duration from eye tracking (representing the amount of visual attention), the number of GSR peaks (indicating the amount of physiological arousal) or the power of a specific EEG band.

After data collection, quantitative analysis techniques and statistics can be applied, such as t-tests and ANOVAs, to non-parametric methods. This often necessitates much bigger sample sizes compared to qualitative research but allows you to make more solid conclusions, that are backed up with data.