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# Sample Size in Qualitative and Quantitative Study

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**Abstract:**
In this article, we attempt a synthesis of sampling in the field of qualitative study and that of quantitative study, based on the various research contributions and the work of the authors, this synthesis attempts to bring order by distinguishing, the size of the sample as objects of research both in the qualitative approach and in the quantitative approach. For this subject, the aspects, which raise problems that are still poorly understand among researchers and students, are present. What types of sample can we construct?

**Keywords:** Population, Sample, Sample size, qualitative method, quantitative method.

**Introduction**:
Sample- population
The statistical method, in general, aims to identify certain properties of a set of measurements (or observations) or to describe this set (called a population).
A population can be a group of human beings, a group of animals, a set of objects; all these elements having in common an attribute or property which characterizes this set of elements. Generally, the statistician does not study the character on the entire population but on a sample extracted from the population, for several reasons such as:

- The size of the population may be very large and the cost of the survey would be too high;
- Access to all individuals in the population is materially impossible;

The number of elements constituting the sample is the sample size.
A good sample must constitute a reduced image of the entire population of which we are studying a well-defined character. The choice of the sample, the collection of the data necessary for the study that we propose to conduct, constitute the fundamental, longest part of the study.
In order to generalize the results obtained on the sample, we want it to represent the target population as best as possible, i.e. the one on which the study focuses.
The essential questions in the general framework.

- *What types of interviews do education researchers use?*
- *What types of samples do they construct?*
- *How do they analyze the data and ensure its validity?*
- *What information do they provide in their articles on the procedures used?*

In the context of this article, we limit ourselves to the size of the sample which poses a problem for researchers and students both at the qualitative and quantitative level, in fact many researchers experience

difficulty in choosing the sample and believe that the sample size should be as large as possible to ensure the reliability of the results.

**Research question**

The question we will try to answer in this article is.

*What types of samples can we construct?*

That is to say, what are the sample size values for which we adopt the qualitative research method or that of quantitative research?

## 1. Sample size in case of qualitative study

A qualitative study does not seek statistical representativeness. A qualitative study aims to uncover as many "themes" as possible related to one or more subjects covered in an interview guide. These themes make it possible to formulate hypotheses, which be verified with a quantitative phase.

The ideal size of a qualitative sample is a different question. Experts refer to the principle of saturation (Savoie-Zajc, 1996a). This principle bases on the idea that the number of qualitative interviews is not know in advance. The new interviews are stopped when they no longer reveal anything new compared to the previous ones.

Dworkin (2012) recalls that most authors suggest sample sizes of 5 to 50. This leaves a lot of margin and does not allow, in advance, proposing a reasonable estimate. He also recalls that in qualitative studies of the "grounded theory" type, having 25 to 30 participants is a minimum to achieve saturation.

Marshall et al. (2013) analyzed the number of interviews carried out in qualitative studies on information systems (IT), these authors distinguish between several qualitative study designs: "grounded theory", "single use case", "multiple use case ". They specify that case studies ("use cases") are more representative and 23 qualitative interviews for simple case studies and 40 for multiple case studies or 24 people interviewed for simple case studies and 39 for multi-case studies. Multiple cases.

For Morse (1994), 30 to 50 interviews are sufficient.

Bernard (2000) notes that most studies use samples of 30 to 60 interviews;

Creswell (1998) (Grounded Theory) recommends 20 to 30 qualitative interviews.

For Bertaux (1981, p.35), the smallest acceptable qualitative sample must be composed of 15 interviews.

According to Ghomari Souhila[1]. Brossier G. and Dussaix A. (1999), Caumont D. (2007), Czaja, R. and Blair (1998), the sample is 20 to 80 interviewees.

Qualitative studies consist of collecting and analyzing elements to explain the facts, motivations and behaviors of individuals.

- It often serves as a preliminary to the quantitative study
- It answers the question "why?" », it allows us to understand a phenomenon in depth (motivations, behaviors) and not to measure it.
- It is not express in figures but in trend or direction of demand.
- Limited number of respondents

There are different methods in qualitative studies; among these methods, we cite interview methods:

- Individual interview (non-directive or free interview, semi-directive interview, directive interview)
- Group interviews.

[1] University of Tlemcen. https://fseg.univ-tlemcen.dz › fseg

**The focus group method**

According to Dr. Pia Touboul[2]. The focus group method is a qualitative method of data collection. This is a group interview technique, a semi-structured discussion group, moderated by a neutral facilitator in the presence of an observer, which aims to collect information on a limited number of questions defined in the 'advance.

In the case of a focused group (Focus group), the sample is also large and depending on its constitution can constitute a bias in the study (for example only choosing motivated and available people). Focus groups make it possible to collect the opinions of several people at the same time and thus benefit from group dynamics, but they can be more difficult to organize and set up than individual interviews, especially when the participants are active people with little availability.

The number of participants is ideally 6 to 8 people, all volunteers. A minimum number of 4 people is essential to ensure group dynamics, a maximum of 12 people to allow everyone to express themselves and be able to moderate the group.

Marc Corbière and Nadine Larivière. (2014) points out that the sample size in the context of interpretative descriptive research is variable, with no precise number of sources of information being recommend […]. The notion of saturation must, be using judiciously […]. These authors cited that the number of participants […] ranges from 11-12 participants to 21-22 and even up to 60 participants.

**2. Sample size in case of quantitative study**

Surveys aim to collect information (usually through questionnaires). From a sample of respondents from a well-defined population.

A sample is a relatively small group scientifically chosen to represent a population as faithfully as possible (Savard, 1978, Chap. 1). Thus, instead of examining the entire population, we study a part or subset of this population which is representative and from which we can draw conclusions for this entire population. Inferential statistics allows, using probabilities, to generalize conclusions from a sample to the entire population with a certain degree of certainty (Spiegel, 1974, Chap. 1). Two types of samples can be distinguish non-probability samples and probability samples.

Non-probability samples: Subjects or objects are chose according to a procedure for which the selection is not random. This type of sample poses several inferential problems

Probabilistic samples: In this case, the subjects or objects are chose according to a procedure where the selection is random. Two rules must be respect in the sampling procedures:

- The sampling frame must include all entities, subjects, objects, or spatial units from which the choice of entities will be made;
- Entities must be selected through an independent and random sampling procedure

**Data analysis**

The analysis of data collected as part of a quantitative study bases on statistical processing. This involves calculating indicators on the sample studied and extrapolating those using statistical methods to the entire population.

[2] (Department of Public Health. Nice University Hospital),

**Principle:**
We estimate the value of the parameter on the population (N) from the value obtained on the sample (n)

**Concept of confidence interval:**
It is an interval, in which the value of the parameter is located on the population, for a given risk of error (generally 5% risk of error)

**Estimation conditions**
For P. Brabant, C. Dillmann, J. Legrand, D. Manicacci, E. Marchadier, S. Ollier, D. Sicard, D. de Vienne (2020-2021), in practice, if n is large enough (often we takes n≥30), we apply the central limit theorem which is the approximation of the binomial law by a normal law. If n is very large (n≥50) we can approximate this binomial law by Poisson's law.
According to Anne-Marie Dussaix. (2009), in a simple random sampling, where the objective is to estimate the average value m of a quantitative variable in a population of size N, if the sample size is sufficiently large (n>30) and (n/N < 0.143).
Likewise R. Giorgi. M. Fieschi, H. Chaudet, J. Gaudart, B. Giusiano, J. Gouvernet, and J. Mancini. Consider that […] the sample studied is large if n ≥ 30, or small, if n < 30.

**Generalization of the average**
Either

- m: the average over the population (N)
- y: the average calculated on the sample (n)
- s: indicator of the standard deviation on the population studied or (max-min)/6

If we assume that the distribution of the variable follows a normal law, we can affirm, with a risk of error of 5% that the confidence interval at the 95% confidence level is estimate by:
**$y-1.96 \times (s/\sqrt{n}) < m < y+1.96 \times (s/\sqrt{n})$**

## 3. Conclusion
We note that
If the sample size is large (n>30 and n/N <0.143) we adopt the quantitative research method
If the sample size is small (n≤30) we adopt the qualitative research method.
The integration of these two methods facilitates a more comprehensive and synergistic use of data than when these methods are used separately.
We use mixed methods methodology in research when both quantitative and qualitative research methods are necessary to effectively answer a research question and achieve the research goals and goals.

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