

# Data Collection Methods; The Rationale Behind Hypotheses; and Sampling in Social Sciences

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## Abstract:

The Social Sciences – consisting of the study of people as individuals, communities, and societies including their behaviors and interactions with one another – could be subsumed under five major disciplines: Anthropology, Economics, Political Science, Psychology, and Sociology. Research works in these fields abound whereas manuals on the three most pertinent aspects of research in the fields under reference are relatively limited or too complex to understand. It thus stands to reason to explain, in layman's terms, the different methods of data collection, the essence of hypothesis construction, as well as that of the various sampling methods. The paper declares the importance of hypothesis which could never be relegated to the background in any research work, and sums up the merits and demerits of the various types of data collection as well as those of sampling methods which could help researchers to select whichever ones are suitable for any given research category.

**Keywords:** Data, Hypotheses, Sampling, Sample, Advantages, Disadvantages

## 1. Introduction

We are dealing with the exposition of three subjects in general: Data Collection Methods; The Rationale Behind Hypotheses; as well as Sampling in Social Sciences. In general, each of these three expositions will be preceded by definitions of fundamental terms to arrive at an assessment by way of partial conclusion. A final conclusion will end them all, followed by a sitography and bibliography. Specifically, the analysis of each subject will be distinct from one another. Regarding the first subject, the exposition will be carried out, after the necessary definitions, based on the advantages, limitations and disadvantages as well as the implementation techniques of each data collection method. The second subject, Why construct hypotheses in social sciences?, will be approached in the following manner: define what a hypothesis is; briefly present its characteristics; and discuss, especially from the perspective of social science research, its importance by referring compendiously to the good effects of its proper formulation as well as the dangers of its absence or poor formulation. The third subject, Sampling can take different forms. Justify this assertion, for its part, will be analyzed, after a laconic explanation of what sampling is, based on the exegesis of its different forms, if any, in order to be able to scrutinize them closely with the intention of knowing whether all these forms have only one characteristic or perform only one function. It is by doing this that it will be justified whether or not sampling is multiform or unique in an apparent diversity of forms.

## 2. Data Collection Methods in Social Sciences

Regarding research, a "method" is, according to R. Quivy and L. V. Campenhoudt (1995: 189), a "device for collecting or analyzing information, intended to test and refine research hypotheses." Such methods

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abound to constitute the exploratory work in the research process. However, for reasons of convenience, let us focus attention on the largest categories: the survey by questionnaire; the interview, as well as direct observation. Before addressing the logic and particularity of each of the methods, let us note the characteristics they commonly share: the objectives of collecting substantial empirical material; of discovering facts; of establishing, revising, or correcting a theory (a scientific principle to explain phenomena); of testing hypotheses, or developing a plan of action. It can also be noted that all stem from observation; none is neither better nor worse than another, but the usefulness of each depends on the "objectives of the research, the model of analysis and the characteristics of the field of analysis" (R. Quivy, L. V. Campenhoudt (1995: 188); one cannot know any of them "until after having experimented with it oneself" (ibid.).

Furthermore, all methods require the totality of "sampling techniques" (ibid.) and they "necessarily call upon auxiliary disciplines such as mathematics, statistics or social psychology in particular" (ibid.). Despite the common sharing of the general trait regarding the objective, each method has purposes for which it is essentially suitable: the knowledge of a population, the analysis of a social phenomenon or the questioning of a large number of people deserving questionnaire survey; the analysis of the meaning given to practices, the analysis of a specific problem, and the reconstitution of the process best benefit the interview; for its part, direct observation is most generally suitable for the objective of analyzing "the non-verbal and all that it reveals as well as studying events as they occur" (R. Quivy, L. V. Campenhoudt: p. 201). R. Quivy and L. V. Campenhoudt (1995: 189) make us observe that all methods similarly share but in diversity the following other traits: a general presentation, variants, objectives, advantages, limitations and problems, other methods with which they often go hand in hand as well as the training required for their respective practices. For reasons of convenience, however, our analysis of each definition will generally and briefly include, especially in the ambiance of the definition, genialities related to the variants and the training required for the implementation of each of the methods; but, specifically, the analysis will be conducted from the perspective of the following traits: definition, advantages, disadvantages, and implementation techniques.

## **2.1 The Questionnaire Survey**

Here is a form that constitutes a series of questions normally with the aim of collecting information for a study. The form having the objective of measuring the attitude or belief of an individual links the process of identifying information to what would be called an opinionnaire instead of a questionnaire as such. Predominantly, the opinionnaire favors most polling and research related to consumer preferences. The questionnaire survey, which is carried out by means of forms, includes instruments or tools through which one responds in writing to appropriately established questions. The questionnaire requires answers to questions of concrete facts while the opinionnaire is used when opinions are desired.

Two fundamental forms of questionnaire exist: the restricted questionnaire and the unrestricted questionnaire. The restricted questionnaire asks for short answers: yes or no; the inscription of a very brief answer, or the selection of an answer from a list of suggested answers. The unrestricted or free response asks for an answer freely expressed by the respondent. Other forms exist: questionnaires administered directly or indirectly through the administration of an organization.

Very often, the questionnaire as a type of survey employs the services of the post. For the adequate implementation of this information gathering tool, the following training is required: techniques of sampling, writing, coding, processing questions as well as computer programs for managing and analyzing survey data, including descriptive statistics and statistical data analysis.

### 2.1.1 Advantages

The advantages of the questionnaire survey as a method prove numerous. The following points are never neglected: the possibility of quantifying and analyzing multiple data; the representativeness of respondents (the questions generally make sense for the totality of the population concerned); the availability of time and means (sending the questionnaire by mail instead of traveling) which increases the proportion of usable responses; as well as the objectivity that accompanies the absence of the investigator. Let us note specifically that the written word left by the questionnaire is very well suited to reference and direct retrieval.

Let us now take a look at the disadvantages of this device.

### 2.1.2 Disadvantages

The disadvantages of the questionnaire method abound. The displacement of the investigator himself to personally contact the respondents makes the device financially costly. Sending by mail is also treated as a lazy attitude. Moreover, one wonders why worry about the investigator's objectives so as to invest time to respond and send the questionnaire again, especially when it is not well developed. Again, preparing a good questionnaire requires so much time, ingenuity and a lot of work. Also, many responses are not submitted to the investigator especially when the questions are difficult to understand and when the following three conditions present themselves: the group of respondents are not affected by the problem being investigated; they do not know the investigator; or they do not see themselves under obligation (implied by their employer), to respond to the questionnaire. This situation materially changes the results of the investigation and creates the instance of frivolous generalization! But is it surprising when most questionnaires are too long or require answers that are too long? Even most of the time, many answers are superficial and not easy to understand. In this case, the reliability of the device becomes fragile since some of the questions are suspected to be misinterpreted. This normally occurs when the questions are prepared by investigators who have no experience and who create, through their questions, a lot of confusion and ambiguities. This is not surprising either when one believes that questionnaires depend only on written language and that sometimes the investigator hardly knows what he wants, let alone how to transcribe it well on the sheet. He even sometimes believes that the respondents' answers will provide him with the reactions that are the object of his gropings.

This makes the contrast voluble between the questionnaire on one side and the interview and conversation on the other. In practice, one very often encounters an investigator who is not always sufficiently trained and motivated to carry out this demanding and often discouraging work.

Similarly, representativeness is never absolute and most of the numerous responses are only preceded. All this also affects the credibility and validity of the instrument that is the questionnaire. Sometimes even, the recourse to polls and surveys becomes abusive and annoying especially when it becomes regular. Moreover, as R. Quivy and L. V. Campenhoudt (1989) would tell us, the survey by questionnaire is little justified for the study of the "content of press articles" and "intensive analysis work on a restricted field". Again, unlike psychological tests and inventories, questionnaires are invalidated by a short duration of time and they are administered to a restricted population.

All these disadvantages constitute a challenge for the researcher but fortunately techniques have been suggested to limit them in order to achieve the objectives of the data collection device that is the questionnaire.

### **2.1.3 Implementation Techniques**

E. Osuala (Introduction to Research Methodology, Third Edition), J. W. Best and J. V. Kahn (1989) as well as R. Quivy and L. V. Campenhoudt (1989) – known later in this present study as "advisors" – inform us about the techniques to adopt so that the questionnaire survey method is reliable. Thus, they propose several conditions to be met: rigor in the choice of the sample; clear and unambiguous formulation of questions; correspondence between the reference world of the questions and the reference world of the respondent; atmosphere of trust at the time of the administration of the questionnaire; as well as honesty and professional conscience of the investigators. If one of these conditions is not correctly fulfilled, the likelihood of the entire work suffers from it. Ambiguity should also be avoided. The investigator should know exactly what he is looking for. According to Hakel (1968), for example, the words frequently, occasionally, and rarely have different meanings to different individuals. Occasionally might mean rarely to one and something else to another. For precision, double negatives, inadequate alternatives, questions leading to a prejudged answer as well as unwanted assumptions should be avoided.

Our advisors do not stop there. Other techniques are proposed to limit the disadvantages of the device in order to realize its advantages: the method must deal with a subject whose importance is sufficiently clear and recognized; it should not require information that is difficult to retrieve such as school reports or census data; conciseness, coherence, precision, attractiveness, clarity of instructions, definition of key terms, good psychological order of questions, planning, testing questionnaires before the version and its presentation to respondents, the propitious choice of respondents, the presentation of questionnaires through the employer or the immediate supervisor of individuals having the desired information, the request and granting of permission, the admission of anonymity, the annexation of a letter courteously explaining the purpose of the study, the vigorous reminder procedure, the propitious choice of the time of year, etc. would be very necessary to better avoid the wastepaper basket as well as require many easy, clear, exact, honest, and unambiguous answers. Moreover, sponsorship would help solve financial problems while the inclusion of a not negligible proportion would reveal so many objectives; Babbie (1973), would make us believe that 50 percent would be passable, 60 percent would be good, and 70 percent would prove very good.

## **2.2 The Interview**

The interview is a kind of formal meeting organized face to face, especially to evaluate and collect data. The interview constitutes an oral questionnaire. Instead of writing the answer, the interviewee gives the desired information orally and especially suddenly, even face to face. As a form of data collection, the interview proves to be an organized study, a methodical investigation on a subject to discover facts, establish or revise a theory, or to develop a plan of action from the discovered facts. For the variants, we have the semi-directive, the semi-directed or centered. The latter constitutes an extremely thorough and detailed method of interview with very few interlocutors.

### **2.2.1 Advantages**

The interview has several assets: the possibility of explaining all misunderstandings and incomprehensions - purpose of the research, what the researcher wants, the instructions, etc.; by correlation, the capacity to manifest between the researcher and his partners good relationships and mutual evaluation of sincerity, including perspicacity; the stimulation by the researcher and the experience of the respondent so as to integrate it with his own and explore significant areas not fundamentally anticipated by the research plan, etc.; the flexibility encouraging conversation and respect for respective frames of reference, which, in turn, easily releases testimonies and legal disputes; by correlation, the belief in a complete spontaneity of the interview and a total neutrality of the researcher; the modesty of the technicality of the required training,

the little apparent technicality required whose competence does not call for a world of particular analysis; the degree of depth of the elements of analysis collected - language, mental categories, etc.; the superiority of the method due to its flexibility - people preferring to speak to write; the suppression of the method due to its flexibility, the suppression of the fear or nausea of disclosing in writing what appears confidential; and the adaptability of the device during interaction with children and illiterates, especially with those who have language difficulties; as well as convenience in some of the areas where motivation is revealed only through actions, feelings, and attitudes.

With all these assets mentioned above, one would even say that this method has no limitations!

### **2.2.2 Disadvantages**

However, disadvantages of the interview exist: the problem of getting accepted by the interviewees; the difficulty of replacing a social behavior with verbal responses to a list of questions established by an interviewer; the hindrance of the process of obtaining data due to the elimination of a multitude of behaviors; the transcription of verbal behaviors during, and after, the interview; the cumbersome procedures of technical directives required as training to liberate and fluidify expression; the blocking of communication by racial, ethnic, religious differences, based on gender, social status, etc.; the taking of a lot of time; as well as the lack of objectivity, sensitivity, and perspicacity with regard to researchers without penetration.

### **2.2.3 Implementation Techniques**

Various techniques come, once again, from our advisors: the need, on the part of the researcher, for a clear conception of the information he wants and of what to prepare for the interview; the necessity to clarify the questions in a psychological and stimulating way to incite spontaneity and deep responses; the obligation to avoid questions unconsciously implying specific responses in order to minimize the danger posed by the requirement of acceptance of an idea implied in the question; by correlation, the need for neutral questions suggesting only particular responses; the requirement of expertise, cooperation, and sensitivity between the interviewer and the interviewee; avoidance of hostility by the discussion of interesting subjects (consideration of sex, race, and possibly any other characteristic of the interviewer vis-à-vis the interviewee is advised); the need for recording exchanges (of course not before the permission of the interviewees) on the spot or after the interview, the most propitious moment for interpretations being after the interview; the obligation of the training of interviewers - the observation of experts as well as the manual (Guenzel, Berkman, & Cannell, 1983) of the Research Institute at the University of Michigan would be very useful; the good formulation of questions and the critical judgment of experts against these questions; as well as the logic of the analysis model, including the well-foundedness of the initial hypothesis.

Note that the techniques above should be adopted in their entirety and that neglecting them in such a significant context would be to show a great epistemological naivety of very distressing consequences!

## **2.3 Direct Observation**

Observation is the art of noting and recording something, especially human or animal behavior, with tools. It always remains the fundamental method of inquiry in general: experimental, descriptive, and historical. It has as variants two major techniques: participant observation (observation from the outside). A dimension of the observation technique, time sampling, was the method used by Fantuzzo and Clement (1981) to observe the behavior of his subjects with regard to their way of showing attention, a method consisting of constantly observing the subjects in a duration of 60 seconds. Hall, et al. (1973) have also

productively applied this method. The information on behaviors in the form of data, once received, is coded through quantification and recording in a systematic and summary way using respective devices and formats. Observations stand out from those that fall under the sense when using especially the tape recorder and the camera. Such devices have been effectively used by Gesell (1948) to make unnoticed observations of child behavior even when certain experts recommend the knowledge of the observer by the observed. The observation method has as required training the practice that sharpens the expert's eye.

### **2.3.1 Advantages**

Our advisors let us know that observation as a research method has quite a few assets. Most theories and laws of the forces of nature come from the "scientific" activity of observation, aided by systematic classification and measurement. Moreover, observation currently characterizes all forms of research. Observation proves to be the most effective with regard to the capture of behaviors and events on the spot. Correlatively, the information being authentic facts, the objectives of the research could easily be achieved. A skilled researcher can easily elicit desired information spontaneously. The process of collecting information becomes easier (classification, measurement, calculation, etc.) when the information sought relates to material objects. It serves to modify behavior, especially from experimental research. In descriptive research, for example, it is thanks to observation that the performance of competitors and adversaries, especially within sports organizations, is monitored.

### **2.3.2 Disadvantages**

Naturally, this research device that is observation also has difficulties. The researcher faces the problem of being accepted as an observer by the concerned groups. It is not easy to observe a sample of sufficient behavior with regard to a very large number of subjects. The method, faced with the study of a human subject in action, becomes complex. This difficulty intensifies during a systematic observation of human behavior in natural settings such as the classroom since such an intrusion is apt to prove reactive and render the situation artificial, which would provoke so many reactionary effects to distort reality. The single observer, unbeknownst to himself, sees only what he would like to see and neglects any event having nothing to do with his theory. Thus, his values, his feelings, and his attitudes to him, founded on his former experience, impose themselves on the observation to make the research fail or disseminate and make believe a false idea as a reality.

### **2.3.3 Implementation Techniques**

Fortunately, the sources of defeats above are combatable by the application of techniques. Observation, first of all, should never, to a very large extent, be carried out without the knowledge of the observed persons. Moreover, observation should manifest itself with the help of detailed observation grids for reasons of logic and recording of events, including any variable: the observed behaviors should be transcribed immediately after the observation without forgetting the details. The observer should learn to observe and to compare his observations and his methods to those of experts or other observers. Thus would observation defy the test of precision, validity, and reliability. He would also need to confront his observations with the reasonably established theoretical reflection.

Regarding objectivity, our researchers make us understand that observation should be conducted to correspond thoroughly to the rigorous demand of the spirit of scientific inquiry. Thus, planning is to be privileged. Observation should be systematic, directed by a purpose, carefully concentrated, objective and entirely recorded and properly measured (but devoid of the dramatic and spectacular) to make a balance of it including only the essential in detail. Regarding objectivity, Kazdin (1982) recommends that the



researcher not be the observer who should not, like the observed, be informed of the aims and hypotheses of the investigation.

Let us conclude this first subject by saying that we realize that each method has its particulars, its advantages, its disadvantages as well as its implementation techniques. However, what most fundamentally links them to one another is their property as useful instruments of data collection in a research project.

### 3. The Rationale Behind Hypotheses in Social Sciences

As already noted in the general introduction, why construct hypotheses in social sciences (in disciplines such as economics, geography, languages, political science, etc.) proves very easy to find out when one first examines what a hypothesis is, its fundamental traits as well as its importance by referring quickly and firstly to the generous outcomes when one formulates it well so as to perfectly embed it in the roots of an investigation especially with theoretical orientation; and secondly, to the nauseating consequences during its absence, poor formulation or inappropriate embedding.

The Wikipedia Encyclopedia provides us with the etymology of the notion of hypothesis by making us understand that it derives from the Greek, *hypotithenai*, which means "to place under" or "to suppose". This idea of supposition is implicitly reiterated by R. Quivy and L. V. Campenhoudt (1995:119), when they say that "a hypothesis presents itself as a provisional answer to a question". For its part, the Encarta 98 Encyclopedia makes us understand that the hypothesis is "an attempt at explanation that accounts for a series of facts that can be tested". It is this lack of attempt at explanation, even prediction, that makes the definition of teachers in the United States ("a learned conjecture", a trial solution to a problem) invalid. Apart from the supposition, explanation, and testing of the hypothesis, another trait emerges: it is based on prior observations or on extensions of scientific theories. The hypothesis refers, even in the good old days, sometimes to an intelligent idea or to a suitable mathematical approach that simplifies complex calculations since Cardinal Bellarmine referred in the 17th century to the explanation of the movement of the Earth by Galileo as a simple hypothesis and not a reality.

There are types of hypotheses. Apart from the fact that it can be scientific, empirical (in confrontation with observational data), worthy or unworthy of trust, and tested (which relates it to the law), the hypothesis is intended to be null ( $H_0$ ) - operates with impartiality - or alternative ( $H_1$ ) - operates in a manner that lacks objectivity. There are also two major methods of evaluation of the hypothesis, namely, the hypothetico-inductive method and the hypothetico-deductive method. The hypothetico-deductive method, formulation of the problematic from the hypotheses and the analysis model, constitutes an approach that applies when discovering a field for the first time. The hypothetico-deductive method requires the falsifiability of hypotheses so that the scientific community can falsify it. This second method applies when illuminating a new field. Note that falsifying or verifying a hypothesis does not necessarily make it proven, which always makes it provisional. The hypothesis is formulated so as to make it possible to be invalidated or refutable or according to Karl R. Popper (*The Logic of Scientific Discovery*, Paris, Payot, 1982) "falsifiable" without which it becomes ascientific. Consequently, the truth of a hypothesis will never be demonstrated since it proves to be defeasible and replaceable sooner or later in whole or in part by increasingly fine and penetrating observations. By way of elucidation, note that the hypothesis may be falsifiable or verifiable but it can never be neither absolutely true nor absolutely false: the conclusions of Durkheim's analyses (Paris, PUF, 1982, under the word "Suicide", p. 534-539) serve as witness. Thus, knowledge results from successive corrections. In relation to sources, hypotheses can be the empirical product of a previous observation, "the theoretical product of reasoning based on a postulate in this case the concept of social

relationship, itself linked to the paradigm of the sociology of action" (R. Quivy and L. V. Campenhoudt, 1995).

Again, R. Quivy and L. V. Campenhoudt (ibid.) let us know that a hypothesis can be explicit, implicit or unconscious and can declare universal realities. The hypothesis also proves to be consubstantial with the problematic so much so that it is difficult to speak of hypotheses without dealing at the same time with the model implied by the problematic. In the context where the model is a system of hypotheses logically articulated between them and where the hypothesis constitutes an anticipation of relationship between concepts, it can be affirmed that the problematic, the model, the concepts and the hypothesis prove to be inseparable. This finding manifests itself in the definition of the analysis model: the set of concepts and hypotheses logically articulated with one another to respond to all aspects of the problem posed (R. Quivy and L. V. Campenhoudt - (ibid).

Apart from the traits above, there are also other characteristics in the form of techniques. According to Schick and Vaughan (Encarta 98 Encyclopedia), researchers examining various hypotheses could take into consideration factors such as testability (verifiability), simplicity (discouragement of several entities), framework (applicability to multiple cases of phenomena) as well as conservatism (compatibility with other epistemological systems). Other techniques are available, this time, they relate to the solution of the problem posed: it is useful to combine several concepts and hypotheses to cover the various aspects of the problem since, to answer the initial question, a single hypothesis is rarely sufficient. Moreover, the researcher should well grasp the condition introduced by each hypothesis that would be totally confirmed. He should also confront the hypotheses with observation and treat them independently of one another. Again, for the hypothesis to be verifiable, the variables must be defined operationally. That is, the researcher specifies what operations were manifested, or what tests were used, to measure each variable.

The traits above lead us to the logic of the hypothesis. That is, to the Rationale that explains why it should be constructed in social sciences. Note, as already indicated, that this logic rests on its importance, on the good effects of its presence and the dangers of its absence or poor formulation.

Regarding the good effects of hypothesis construction, it is first noted that it provides the suggested solution that is based on evidence. In this context, researchers could examine or reject several hypotheses before solving a problem. According to R. Quivy and L. V. Campenhoudt (1995: 119), the hypothesis helps to "clarify one last time the central question to the research".

Again, putting the emphasis on hypotheses constitutes one of the ways to construct the analysis model since the hypotheses come first and then the concepts. There is no observation or experimentation that does not rest on hypotheses. In its relationship with a theory, the hypothesis helps to develop it. It indicates the parts of an existing theory in a verifiable form. It constitutes the first step, among six others, of a theory (Snow: 1973). Many of them can be formulated to continue the process of theory formulation. The non-formal hypothesis proposes itself daily in a speculative form to be tested directly and possibly used to solve a problem. For its part, the formal hypothesis which is said to be scientific is an affirmative statement that predicts the consequence of unique research, an explanatory attempt of the relationship between two or more variables. The hypothesis is formulated to verify the validity of a theory in a perspective of past experience, observations, and/or information received from others. Thus, it constitutes the root of a theory.

The hypothesis is based on the results of previous research. The essential and what gives hope, is that it can be supported or rejected when found unworthy. Moreover, it can be judged to be true or false. Parallely, the hypothesis focuses the research on a defined target and determines which observations, or which measurements, to use.



Hypotheses can also be constructed since so many dangers are concealed in the ambiance of their absence or in their lack of articulation between them. First of all, one realizes that when they are not explicitly constructed, they lead to impasses, with regard to research in social sciences. The system becomes vulnerable by the deficiency and the analysis model becomes obsolete because it becomes assailed with infirmities. These infirmities normally deriving from relationships founded on prejudices or stereotypes of the ambient culture. Thus, the understanding of the investigation becomes mediocre, without direction, and the result is the deformation of social reality since manifestations of the allure of scientific truths appear.

Thus is indicated in the analysis of our second subject, apart from the various characteristics of the hypothesis, the fundamental reasons that underlie its construction: the benefits of the formulation and the dangers of its absence or construction in a bad way.

#### **4. Sampling in Social Sciences**

J. W. Best and J. V. Kahn (1989: 11) implicitly provides, by interpretation of the term "sample", a classic definition of what sampling is. Thus one would infer that the term "sampling" means the art of choosing a small proportion of a selected population to be observed and analyzed. By observing the characteristics of this sample, one can draw inferences about the characteristics of the population from which it is drawn. Contrary to certain popular opinions, samples are not selected in an arbitrary way; they are chosen randomly in a systematic manner, so that chance or the operation of probability can be used (E. Osuala (ibid.): 114). Sampling thus constitutes the taking of any segment of a population or a universe. For example, when a high school principal visits certain classrooms in his school to get a feeling of what is happening in the school, he is sampling said classes from among all the classes in the school. The principal can visit a teacher's class two or three times to sample his teaching. In this case, he is sampling the pedagogical behaviors from the universe of all possible behaviors of the teacher.

The dictionary of The Encarta Encyclopedia 1998 also makes us infer that sampling consists of choosing a portion, a piece, or a segment, representative of an entity or selecting a series of elements drawn and analyzed to estimate the characteristics of a population. The Wikipedia Encyclopedia abounds in the same direction. The Encyclopedia offers us a very important aspect of sampling, what is called frequency, cadence or sampling rate. Certain deductions come from said definitions and explanations. Thus, sampling has the propensity to be quick and precise, to avoid the impractical choice of the aggregate instead of the fraction, to offer an enlarged framework, to save time, to obtain personnel to study the problems and an external validity, to reduce the cost, to easily quantify the data and to use the results to draw conclusions regarding the entire population.

Other characteristics of sampling exist. These characteristics also pass for implementation techniques. Firstly, samples should be truly representative but not necessarily drawn from a local region that is relatively small, like Oakley's sample (1974) in E. Osuala (Introduction to Research Methodology, Third Edition). Correlatively, the sample should cover an extended range and focus attention on specific subgroups whose sampling frames do not exist. However, the ultimate purpose should be made paramount in order to better understand the processes regarding obtaining a representative sample; and define the population that is the subject of the study so as to conform to the available lists. Osuala (ibid) cites as an example the efficient sample of Mansfiel and Collard (1988) whose 65 couples chosen, despite their representativeness, highlight a range quite representative of couples in their country and whose replacement of their list of civil marriages by that of marriages solemnized in the church conform very effectively to the fundamental principles of sampling. Thirdly, in choosing the sample, one should recognize the constraints of interpretations

(differences of age, classes, size, race, religion, etc.) having as source the method of sampling chosen in order to point them out to the readers. To add, perhaps unconsciously, to the characteristics in the form of implementation techniques, E. Osuala (ibid., pp 119-120) signals the stages of the sampling process: define the population, obtain a list of units in the population, determine the size of the sample to represent all the characteristics of the population, and draw units from the list so that they represent the total universe.

In order to get to the heart of subject number three, the following kinds of sampling should be taken into account: systematic sampling, random sampling, stratified random sampling, domain or cluster sampling, non-probability sampling, snowball sampling, and quota sampling.

#### **4.1 Systematic Sampling**

Systematic sampling consists of selecting any number among others from a list. By way of illustration, let us listen to J. W. Best and J. V. Kahn (1989:14):

"For example, if one were to select a sample of 200 from a telephone directory on a list of 200,000 one could choose the first name by randomly selecting a name in a fortuitously selected page. Then each thousandth name would be selected until the sample of 200 names had been complete. If the last page was reached before selecting the desired number, the calculation would continue from the first page of the directory".

#### **4.2 Random Sampling**

This method consists of choosing a segment (or a sample) of the population or the universe so that each member of the population or the universe has an equal chance of being selected. In other words, the selection is impartial in the context where no member of the population or the universe has more chance of being selected than his counterpart. This definition relates this method to the previous one, to make one think that it is a variant of it. E. Osuala (ibid.) indicates that this method has the advantage of specifying the traits and parameters as well as conducting analytical studies including the testing of empirical hypotheses while developing interviews and other research tools. Moreover, the method proves very propitious when the population is infinite and when a list of its members does not exist, or when the geographical distribution of individuals is scattered at great intervals.

The fundamental technique that would be required for the implementation of such a method consists of developing and testing the research instruments by trying them on an extended range of respondents. Unfortunately, this method cannot be put into practice given the administrative limits of selecting and assigning individuals to the experimental and control groups. Moreover, it is often unrealistic for qualitative research or research on a small scale. There is a variant of this method, domain or cluster sampling, which can set aside this gap.

#### **4.3 Cluster or Domain Sampling**

This variant of the simple random sampling method proves practical for large-scale studies. J.W. Best and J.V. Kahn (1989:15) illustrate this by describing the selection of a sample of teachers from all public elementary schools in the United States:

"From the 50 states, a random sample of 20 could be selected. From the 20 states, all counties could be listed so that 80 counties can be selected. From the 80 counties, all school districts could be listed to select

a random sample of 30 school districts. It would not be difficult to compile a list of all the teachers from the 30 selected school districts in order to randomly choose 500 teachers.”

This method proves to be very practical and inexpensive. However, it is likely to introduce bias due to the unequal size of some of the selected components. J.W. Best and J.V. Kahn (1989:15) therefore recommend this method only when simple random sampling is impractical.

Aside from the varying sizes of the respondent groups, this method is essentially another variant of the two preceding methods, particularly in relation to the role of chance.

#### **4.4 Stratified Random Sampling**

This method involves dividing the population into homogeneous subgroups to achieve more accurate representation. E. Osuala (ibid.) recommends stratification as a very straightforward plan since it is inexpensive but offers greater precision.

According to E. Osuala (ibid.), the downside of this method is that it may produce a lower degree of error, and solving this would require effectively separating each stratum while maximizing the similarity of elements within each stratum.

The element of chance gives the impression that this method is simply another variant of the three previous ones.

#### **4.5 Non-Probability Sampling**

Quoting J.W. Best and J.V. Kahn (1989:15), this method “uses whatever subjects are available, rather than following a specific subject-selection process.” They further illustrate this with a classic example from an educational setting where researchers use available classes as samples.

This is a method that E. Osuala (in *Introduction to Research Methodology*, Third Edition, p. 128) refers to as snowball sampling. According to him, snowball sampling is used when there is no sufficiently complete list that can be used as a sampling frame. This method aims to obtain samples from numerically small groups. The approach involves meeting one member of the group and asking if they know another person with similar characteristics.

The fundamental advantage of this method is that it bypasses administrative and financial limitations of random sampling. The major disadvantage is that certain procedures may produce samples that do not accurately reflect the characteristics of the target population.

The influence of chance cannot be ignored! According to E. Osuala (ibid., p. 129), a variant of this method is called quota sampling. And logically, can this quota variant really escape the role of chance?

#### **4.6 Quota Sampling**

This is a non-probability sampling method aimed at making the sample fairly representative of the population by establishing quota controls (Osuala, ibid). In this method, quota controls related to the subject of the study must be fulfilled by selected participants. Let’s take an illustration from Osuala (ibid):

“For example, a study on women's buying behavior may require a control for employment status, since the buying behavior of full-time homemakers differs from that of working women. The researcher must be aware of the segments of the population with each characteristic in order to specify the quota controls.”

This method, which is most suitable for research in marketing, polling, and audience studies, shares both the advantages and disadvantages of non-probability sampling.

To conclude this third section, we note that all the sampling methods discussed are connected by the principle of randomness and the shared goal of making data accessible. This suggests that all these methods are essentially variations of one, challenging the notion that sampling can take many distinct forms. However, the organic existence of various sampling methods—systematic sampling, random sampling, stratified random sampling, cluster/domain sampling, non-probability sampling, snowball sampling, and quota sampling—whose application depends fundamentally on the objective and the size of the respondents, can support the claim of their distinctiveness.

## 5. Conclusion

In the above analysis, we have discussed three important phenomena related to social science research: the different methods of data collection, the importance of constructing hypotheses, and the various forms that sampling can take. Regarding the first, our discussion explored different methods such as questionnaire surveys, interviews, and direct observation, along with their respective advantages, disadvantages, and techniques for implementation. Regarding the second phenomenon, we examined the general characteristics of hypotheses and discussed their importance by referring to the creative effects of good formulation as well as the dangers of their absence or poor formulation. We then analyzed the third phenomenon by explaining each of the sampling methods in detail. Our general conclusion is that research methods, the role of hypotheses, and the various sampling methods share a common aim: to demonstrate the scientific nature of research in social sciences by emphasizing objectivity, logic, and the development of generalizations, principles, or theories based on empirical evidence in order to propose reliable predictions and solutions to problems.

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