Journal of Applied Biomedicine
1: 29 – 40, 2003
ISSN 1214-0287

Scientific research: methodological guidelines for the social sciences

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Summary
Scientific research is one of a number of roles in the role repertoire of students and academics. However, to successfully fulfil this role, one has to understand the meaning of various concepts e.g. science, scientific research, scientific method and theory. In describing these concepts the meaning of the goals of science and scientific research, as well as the method of composing a research proposal all become clearer.

Keywords: science – concepts – methodology

INTRODUCTION

In the minds of many students scientific research, like theory, is a dry academic activity that developed in the ivory towers of stuffy universities and which has no practical relevance for everyday life. However, most people are engaged in some form of *research* in their daily lives. Everyone describes events, explains what causes these events, predicts the future occurrence of these events, proposes solutions and learns how to control these events to his/her own advantage. The main difference between "everyday" research and "scientific" research is that the social scientist uses methods and considers objective evidence in scientific research, - evidence which anyone can check, rather than subjective opinions or the word of an authority (Bunker et al. 1975).

AIMS

The aims of this article are fourfold:

- To sensitize students and academics to the fact that the definition of the following concepts are crucial in order to understand the meaning and implication thereof for conducting research: *science, scientific research, scientific method and theory.*
- To outline the goals of science and scientific research.
- To outline the components of a research proposal.
- To give an indication of how the chapters of a mini-dissertation, dissertation. or thesis could be structured.

CONCEPTUALIZATION

We present the meaning of the concepts *science, scientific research, scientific method and theory.*

The concept science

Science points to the application of systematic methods to obtain knowledge and the knowledge obtained by those methods (Henslin 1999).

The concept scientific research

The term *scientific research* implies that a disciplined method of thinking is followed about social phenomena (e.g. order, change, poverty, etc.) in order to arrive at a better understanding of the world in which we live. We notice and observe events daily. From observing and noticing events and their relation to other events we hold an opinion, make statements and have ideas about these events. For example, we make a statement that poverty is one factor that

contributes to sustaining HIV/AIDS. This statement is an observation of two factors, viz. poverty and HIV/AIDS. However, in order to find out if this statement is correct, it could be stated as a hypothesis and a method can be developed to verify (measure and test) it. And this is the meaning of the concept scientific research, viz. taking a personal, subjective impression, e.g. that poverty sustains HIV/AIDS, and verifying (measuring and testing) it with objective evidence (Bunker et al. 1975).

The concept scientific method

The term scientific method refers to the " … building of a body of scientific knowledge through observation, experimentation, generalization, and verification. The scientific method is based on the assumption that knowledge is based on what is experienced through the senses, and that if a statement concerning natural phenomena is to be accepted as meaningful or true it must be empirically verifiable. Thus any scientific law must be based on empirical evidence" (Theodorson and Theodorson 1970).

Although scientific method depends on the collection of empirical facts, it extends beyond this. Facts alone do not constitute a science. To have any meaning, facts must be ordered in some fashion, analyzed, generalized, and related to other facts. Thus, *theory construction* is a vital part of the scientific method (Theodorson and Theodorson 1970).

The concept theory

Theory is an explanation of how two or more facts are related to one another (Henslin1999; Popenoe 1995). By providing a framework against which one can analyse and examine observations, each theory interprets reality in a distinct way. For example, the major sociological theories are functionalism, conflict and symbolic interactionism. A theory is used to organize empirical observations, to produce logically-related statements about observed behaviour, and to relate observed social facts to the broad questions social scientists (e.g. sociologists) asked, e.g. "How is social order maintained in society?"; "Why does inequality exist in society?"; "How does social change occur?". In answering these and other questions from a functionalist, conflict and symbolic interactionist perspective, different answers are provided and different concepts are used.

THE GOALS OF SCIENCE AND SCIENTIFIC RESEARCH

The goals of science and scientific research are fourfold, viz. to generalize, to explain, to predict and to present solutions:

- To construct accurate generalizations which describe and account for regularities of human group life. These generalizations are social theories (Winton 1974). To achieve generalizations, social scientists look for patterns, viz. recurring characteristics or events (Henslin, 1999:8).
- To explain according to a theory or theories why something happens or exists. For example: Why does poverty exist in society? Various theories provide various answers to this question. For example:
  - ☛ From a functionalist perspective a possible answer might be that the poor in general fulfill an important latent function as they contribute "positively" to the economic system. However, poverty is also manifestly dysfunctional as it tends to disenable and demotivate the poor to make a direct significant economic contribution to society. Ironically then, a lack of ambition and idealism among the poor becomes functional as the poor do not have goals they cannot achieve.
  - ☛ From a conflict perspective an answer is that the poor (underclass) are poor not because of their lack of ambition or ability, but because of structural constraints, inter alia inequality. Inequality refers to a state of social organization that does not provide equal access to resources and opportunities to all citizens and where rewards are limited.
  - ☛ From a symbolic interactionist perspective one could argue that poverty could be ascribed to shared expectations and definitions of situations. The poor often share negative definitions of themselves, e.g. having feelings of being "no good". These definitions are significantly different from the self-definitions of the non-poor population. This belief system reinforces and perpetuates the lifestyle of poverty and tends to lead to self-fulfilling prophecies, viz. one is no good because he/she believes it to be true and therefore starts acting accordingly
- To predict what will happen in the future in the light of current knowledge, according to gathered information (empirical investigation) about a social phenomenon (e.g. poverty) as well as relevant theories.

- To present solutions based on gathered information (empirical investigation) about a phenomenon (e.g. poverty) as well as relevant theories for the existence of a social problem (e.g. how to alleviate poverty).

THE COMPONENTS OF A RESEARCH PROPOSAL

In order to conduct social science research, one has to compose a research proposal, viz. to develop a research design. The reason why it is necessary to design one's research, is that it serves as a guideline in structuring one's research in such a manner that the study one is planning will be worthwhile. The following steps lead to the construction of a research proposal:

- Tentatively formulate a title.
- State the research problem.
- Indicate what the aims of the research are.
- Formulate a theoretical statement.
- Indicate the method of research that will be utilized.
- Provisionally structure the chapters.

Each of the abovementioned steps and components of a research design will be discussed.

Proposed title

The title should concisely and specifically identify the exact topic of the proposed research by demarcating the research, for example: A People-Centred Appoach to Alleviate Poverty and Sustain Development in South Africa. By formulating a title in the above manner, one indicates what has to be investigated and why it must be investigated.

After having formulated the title of one's research project it is important to indicate the key words which are reflected in the proposed title (theme of research), for example:

Stating the problem

Social science research is problem-directed. In stating the problem the following two questions have to be asked and answered:

- What has to be investigated?
- Why must it be investigated?

To answer these questions, one has to follow the steps outlined below:

- Indicate unequivocally that the problem (e.g. poverty) is presently unsolved or that there is a need or a possibility for new or meaningful development of ideas or knowledge. This must be social

  confirmed with reference to recent research as documented in relevant books, articles in scientific journals and on the Internet. Focus primarily on problems, disparities, unanswered questions or possibilities for creative development of the theme of one's investigation.
- Indicate why it is necessary to investigate the problem or to find an answer to the research question – in other words, indicate the actuality of the subject.
- In the framework of the statement of the problem and the motivation for investigation of the problem, one must explicitly formulate a research question(s) for which the proposed investigation aims to find an answer, for example: Will a people-centred approach to the alleviation of poverty contribute to sustainable development in South Africa?
- Also indicate to what extent, or in what respect the proposed research will contribute to answering the research question as well as the development or elaboration of knowledge in this regard.

Aims of research

After having formulated the problem to be investigated, a clear indication of the aim(s) of the study should be given. However, the aim(s) of the research flow(s) directly from the statement of the problem and has (have) to be directed in order to answer the research question(s), for example:

The aim of this research project is to establish the role of a people-centred approach in alleviating poverty through sustainable development in South Africa. This aim comprises three objectives:

- *To define the concept* poverty *and to explain the persistent occurrence of this phenomenon by utilizing three sociological theories, viz. functionalism, conflict and symbolic interactionism.*
- *To give some indication of the extent, causes and consequences of poverty in South Africa.*
- *To explore and outline some characteristics of a people-centred approach to alleviate poverty and sustain development.*

Formulation of a theoretical statement

The formulation of a theoretical statement flows directly from the aims of the research and serves as a guideline in the search for answering the specified research question(s) which is (are) incorporated in the statement of the problem. When thinking about the

problem which one wants to investigate, one also has to make predictions that are as specific as possible. Such predictions or reasonable guesses (Leedy 1974) could be derived from inter alia the following:

- A postulate
- An hypothesis

A POSTULATE (AXIOM)

A postulate (axiom) is a fundamental assertion and is taken to be true, e.g. No person wants to be poor. Theory is grounded on postulates (Lin 1976, Bailey 1982).

AN HYPOTHESIS

An hypothesis is a statement of a specific relationship between two variables (a variable is a concept that varies, e.g. age, sex, status, class. The language of quantitave research is one of variables and causal relations among variables) (Neuman 1994:97). The predicted relationship between two variables can be verified (measured and tested) empirically (Bunker et al., 1975). An hypothesis directs the researcher to the facts (Leedy 1974). From the point of view of different sociological theories, examples of an hypothesis will suffice:

- Taken from a functionalist perspective: Poverty is manifestly dysfunctional as it tends to disenable the poor from making a direct significant economic contribution to society.
- Taken from a conflict perspective: Inequality (as a structural constraint) sustains poverty.
- Taken from a symbolic interactionist perspective: The belief system of the poor, e.g. feelings of being "no good", reinforces their lifestyle of poverty.

METHOD OF RESEARCH (RESEARCH TOOLS)

When one is conducting research, one has to answer the following question: How must the problem be investigated? The answer is, of course, by using research tools which are appropriate for collecting information and to test one's ideas as indicated in the formulated postulate or hypothesis by means of qualitative and/or quantitative research designs. One will primarily make use of one or more of the following research tools:

- Qualitative content analysis. A comprehensive study of relevant literature on the problem one wants to investigate, e.g. poverty.
- A theory or theories assisting one to use the most appropriate conceptual model to structure one's reseach and to explain the existence of the problem one is going to investigate. Always keep in mind that concepts are the building blocks of theory (Turner 1989) and any conceptual model and approach " … can be used for correcting errors in theories made with its aid. It is itself open to modifications, in ways that make it more useful as an analytic tool and empirically closer to the run of facts" (Mills 1969).
- Research methods in order to test ideas as indicated in the formulated postulate or hypothesis.
- Data analysis.

It is now necessary to consider each of the abovementioned research tools in some detail.

Qualitative content analysis

Literature in books, articles newspapers and the Internet, relevant for the research theme (e.g. on poverty), has to be consulted. In a relevant chapter of one's mini-dissertation, dissertation or thesis, the specific literature on the theme has to be analysed critically, interpreted, evaluated, integrated and used in developing the line of argument. The reason why one has to do this, is that one must describe and outline the extent of the problem one is investigating in as much detail as possible. In consulting the literature, one will come across many statements or postulates. However, one must only focus on and select those bits of information that one finds appropriate in order to reach the goals one sets for the study.

Theoretical foundation

Decide on the relevant theory or theories that one intends using to direct and structure the project. An appropriate theory (or theories) also provides guidelines for interpreting and evaluating the literature on the research theme as well as explaining the social problem one is investigating, e.g. poverty. In order to structure and order the information on, for example poverty, one will logically do so in accordance with the concepts or key terms peculiar to a specific theory. The following concepts or key terms are peculiar to the following sociological theories:

- Functionalism: system, structure, functions (manifest, latent, dysfunctional), equilibrium, value consensus.
- Conflict: conflict, competition, struggle, change, power, coercion, inequality, exploitation.
- Symbolic interactionism: symbols, interaction, meanings, definition of situation.
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An example from each of these theoretical perspectives will now be examined.

A functionalist perspective

From a functionalist perspective, society is viewed as a social system composed of various parts or subsystems, each performing a particular function which, when fulfilled, contributes to a dynamic equilibrium (homeostasis) in society and thus tends to persist as a functional component of society. When applied to poverty, the goal of assistance to the poor is therefore to mitigate certain extreme manifestations of social differentiation, so that the social structure may continue to be based on this differentiation (Simmel 1978).

The poor are largely caught up in what seems to be perpetual poverty due to the fact that they, in contrast with the middle and upper classes, continue to do the low-paying, menial work. Paradoxically, poor people thus also enable the affluent to pursue their business and professional careers by for instance creating jobs for social workers, psychologists and other professionals who serve the poor. Poverty furthermore creates jobs for police and other law enforcers by protecting others from the poor who often turn to crime to make ends meet (Gans 1971). The binding function which the poor perform within society is therefore not generated by the mere fact of being poor. Only when the social system reacts toward the poor with assistance, do the specific social roles of the poor become evident (Simmel 1978).

From this perspective, it becomes obvious that the poor in general and particularly in South Africa fulfill an important (latent) function as they contribute "positively" to the economic system. However, poverty is also manifestly dysfunctional as it tends to disenable and demotivate the poor from making a direct significant economic contribution to society. Ironically then, a lack of ambition and idealism among the poor becomes functional as the poor do not have goals they cannot achieve.

Without implying that all poor people are of inferior ability, there are of course people who are naturally inferior in ability to others and who are therefore more likely to be poor because they cannot successfully compete with people of superior ability (Renzetti and Curran 1998). Very often then their aspirations and ideals are consistent with their achievement potential.

A conflict perspective

From a conflict perspective, society is viewed as being composed of groups competing for scarce resources, e.g. power, status, prestige, wealth and influence.

From this perspectve, the poor (underclass) are poor not because of their lack of ambition or ability, but because of structural constraints, inter alia inequality. Inequality refers to a state of social organization that does not provide equal access to resources and opportunities to all citizens and where rewards are limited (May 2000; Renzetti and Curran 1998). An unemployment figure of 33,9% in South Africa (Statistics South Africa:1999) is an indication that the "… structure of opportunities has collapsed" (Mills 1968).

Poor people (the periphery) lack the purchasing power to buy huge quantities of products from the centre producers (wealthy). To sell their output, the centre producers raise the need levels of the middle and upper classes through aggressive marketing and advertising. This however, also has an effect on the needs structure of the poor as they too begin to desire the commodities produced by the wealthy. An important consequence of this is that when the money of the poor is spent on centre products, peripheral producers lose their markets.

Both the increase in needs and the decrease in potential for production widen the poverty gap between the centre and the periphery. This mechanism again induces the periphery to sell its raw factors of production to the centre to obtain an income. As a result of technological advances and changes like mechanisation, fewer employees are required while at the same time the poverty-stricken are less able to contribute and adapt to these advances and changes. Technological advancement and changes however make the centre less and less dependent on the factors of production offered by the periphery. Underdevelopment in the periphery results from the inability of the poor to respond with an increase in production to an increase in needs, while over-development amongst the wealthy is the result of the necessity to raise needs artificially in order to dispose of surplus production (Nürnberger 1999).

A symbolic interactionist perspective

From an interactionist perspective, society is viewed as being composed of symbols that people use inter alia to establish meaning and develop their views of reality. From this perspective society is located within the individual's definition of social reality.

Applyed to the problem of poverty, this perspective ascribes poverty to shared expectations and definitions of situations. The poor often share negative definitions of themselves e.g. having feelings of being "no good". These definitions are significantly different from the self-definitions of the non-poor population. This belief system reinforces and perpetuates the lifestyle of poverty and tends to lead to self-fulfilling prophecies, viz. one is no good because he/she believes it to be true and therefore starts acting accordingly (Renzetti and Curran 1998). A very effective means of

controlling the poor and perpetuating poverty is therefore to convince them that they are inferior.

Some people are also poor because they have not adopted a work ethic conducive to the development of prosperity, e.g. an ethic which defines it as right and good to work hard and to be productive in order to hold positions in the labour market. Many of the negative attributes associated with poverty are the result of some poor people's unwillingness to aspire with constructive and persistent effort to a better quality of life. Moreover, the poor often socialize their children into a culture of poverty (with distinctive values, norms and attitudes). Reluctance to change their situation keeps a culture of poverty alive, thus ensuring that it persists over time. Maintaining a culture of poverty prevents the poor from competing with other groups for scarce resources (Renzetti and Curran 1998; Sullivan et al. 1980). However, in many instances the existence and perpetuation of a culture of poverty assist the poor to survive by adjusting to their situation through internal support relations; this lends to poverty the characteristics of a "subculture".

Whatever the explanation, from whichever theoretical perspective, and irrespective of whether or not these perspectives are correct in their definitions of the situation of poverty, the fact remains that poverty seems to contain an inner momentum which causes it to persist over time with an astounding degree of tenacity.

Research methods

The selection of a research method(s) depends on whether or not one is conducting qualitative or quantitative research. In the selection of an appropriate research method(s), one has to indicate why one intends using a specific method(s).

Qualitative research methods

Qualitative research is an approach to gathering information by means of participant observation, hidden observation, historical records, and non-reactive techniques to generate hypotheses (Landis 2001). By utilizing these methods of data collection, descriptive data such as people's own written or spoken words, and observable behaviour are gathered (rather than primarily statistics and numbers as is the case with quantitative methodology). With qualitative research the emphasis is more on subjective than objective interpretations. This implies that when a qualitative strategy is followed, inductive reasoning is pre-eminent in the building of a conceptual model (generalizations are inferred from specific facts) (Theodorson and Theodorson 1970). Thus, the application of a qualitative research strategy is by nature the generation of a new theory, because theory develops during the data collection process (Neuman 1994).

Characteristics of qualitative research

The following are the chaaracteristics of qualitative research: (Schurink and Schurink 1997a:; Schurink and Schurink 1997):

- It is research that produces descriptive data: people's own written or spoken words, and observable behaviour rather than quantitative methodology (primarily statistics and numbers).
- It is a craft : there are guidelines but never rules and it sets the sociological imagination free in order to understand holistically people from their own frame of reference : their inner life, moral struggles, successes, failures, hopes and ideals (Mills 1968).
- It is the interpretation or construction of the lived experience of subjects.
- Knowledge and truth cannot be discovered by researchers but can only be constructed by them in partnership with the subjects. Therefore, qualitative methodology is flexible and theory can be causal or noncausal and is often inductive: researchers develop insights from patterns in the data, not by collecting data to assess a preconceived model or hypothesis (Neuman 1994).
- Validity is emphasized.
- It follows a cyclic path to allow for critical reflection of one stage before proceeding to the next.
- A wide range of strategies or frameworks of enquiry, each with its own paradigm and methods of data collection and analysis, can be employed from which a researcher can make a selection, viz. ethnography, phenomenology, action research, symbolic interactionism, grounded theory.
- Sampling is determined by the richness of the data source. Decisions regarding the qualitative sample are not fixed. As qualitative researchers gain more insight and as a theory emerges, they redefine their sample on an ongoing basis.
- Sampling methods most used include snowball or chain reference sampling, theoretical sampling, extreme or deviant sampling, maximum variation sampling and confirmation and disconfirmation of cases.
- A researcher has to prepare himself/herself emotionally and intellectually to undertake fieldwork. Important decisions need to be taken: how one should go about entering the setting; how permission to enter should be obtained from the gatekeepers; how a relationship could be formed between the researcher and the subjects; how the data may be recorded (the first draft of the protocol).

Tools which are used in qualitative research

The tools which are used in qualitative research depend on the paradigm (meta-theory) one is utilizing. A paradigm has both an ontological (a conception of the nature of social reality) and epistemological component (an idea of how this reality should be investigated if meaningful knowledge is to be acquired (Joubert 1986). Schematically the tools of qualitative research can be presented as follows:

Quantitative research methods

Quantitative research is an approach to gathering information that uses survey data, statistics, and frequency distributions to test hypotheses. The emphasis is more on *objective* than subjective interpretations (Landis, 2001:471). A reseacher who uses quantitative methods gathers data after he/she theorizes, develops hypotheses, and creates measures of variables (Neuman 1994).

Characteristics of quantitative research

The characteristics of quantitative or empirical research are the following:

- It is Research that primarily produces statistics and numbers from precise measurement. Measurement could be nominal (that there is a difference among categories, e.g. religion: Protestant, Catholic, Jew, Muslim), ordinal (that a difference exist among categories and that the categories can be ranked, e.g. opinion measures: strongly agree, agree, disagree, strongly disagree), interval (that a difference exist among categories, that the categories can be ranked and that the amount of distance between categories can be specified, e.g. scores: 95, 110, 125) and ratio (that a difference exist among categories, that the categories can be ranked, that the amount of distance between categories can be specified and that a true zero exists, e.g. money income: $10, $100, $500) (Neuman 1994).
- Rules are laid down on exactly how to conduct the investigation and to test the hypotheses.
- It is an attempt to understand specific aspects of peoples' behaviour without their own frame of reference.
- It is the analysis and interpretation of the experience of subjects according to the conduct of a survey by means of a preconceived questionnaire.
- Knowledge and truth are discovered by researchers. Therefore, quantitative methodology is inflexible and theory is largely causal and deductive : thus one begins with a general topic, narrows it down to research questions and hypotheses and tests the hypotheses against empirical evidence. Researchers develop insights from collecting data to assess a preconceived model or hypothesis (Neuman 1994).
- Reliability and replicability are emphasized.
- Usually it does not follow a cyclic path to allow for critical reflection on one stage before proceeding to the next. Procedures are standard, and replication is assumed (Neuman 1994:).
- A wide range of strategies or frameworks of enquiry, each with its own paradigm and methods of data collection and analysis, can be employed from which a researcher can make a selection, viz. experiment, survey (questionnaire), content analysis.
- Sampling is be determined by the representativeness of the respondents. The respondents are selected in such a manner that whatever is learned about those comprising the sample would also be true of the population from which they were selected (e.g. prostitutes) (Babbie 1990).
- Two major types of sampling methods are used, viz. probability sampling (each person or case in the population of, for example prostitutes, has a chance of being included in the sample by way of the following probability sampling techniques: random sampling, systematic sampling, stratified sampling, multistage cluster sampling, multistage stratification cluster sampling, probability proportionate to size sampling) (Babbie 1990), or nonprobability sampling (it is not known whether each person or case in the population of, for example prostitutes, has a chance of being included in the sample by way of the following nonprobability sampling techniques: purposive or judgmental sampling, quota sampling, casual sampling (Babbie 1990).
- A researcher has to prepare himself/herself emotionally and intellectually to undertake empirical or quantitative research. Mills (1968) justifiably indicates that should one have no staff to assist you in doing empirical research, it causes a great deal of trouble. However, " … if one does employ staff, then the staff is often even more trouble" (Mills 1968).

Tools which are used in quantitative research

Tools which are used in quantitative research to collect information (data) are experiments, questionnaires and content analysis.

Experiments

In an experiment a researcher introduces a stimulus to a subject or group and then observes the response. In manipulating the independent variable (e.g. exercise) the researcher watches for change in the dependent variable (e.g. heart disease) (Landis 2001).

Questionnaires

A questionnaire consists of a list of structured and/or unstructured questions to be answered by the respondent. It could be self-admimistered by the respondent or be read to the respondent by an interviewer (Bailey 1982).

Content analysis

Content analysis is essentially a coding operation. Coding is the process of transforming raw data into a standardized form. In content analysis recorded human communications (whether oral, written, gestures, paintings, laws, web sites) are coded or classified according to some conceptual framework (e.g. newspaper editorials may be coded or classified as liberal or conservative) (Babbie 2001).

Data analysis

Data analysis means a search for patterns in data, e.g. recurrent behaviours, a body of knowledge. Once a pattern is identified, it is interpreted in terms of a social theory or the setting in which it occurred (Neuman 1994).

Data analysis: qualitative research

Good work in social science is not made up of one clear-cut empirical research project. It is composed of a good many studies which at key points anchor general statements about the shape and the trend of the subject (e.g. poverty). The decision on what the anchor points are cannot be made until existing materials are re-worked and general hypothetical statements constructed (Mills 1968). Qualitative data are in the form of text, written words, phrases, or symbols describing or representing people, actions, and events in social life. Except for the occasional content analysis study, qualitative researchers rarely use statistical analysis (Neuman 1994).

When one is undertaking qualitative research one is " … at work on problems of substance …" and " … (one has) the exceptional opportunity of designing a way of living which will encourage the habits of good workmanship" (Mills 1968). A qualitative researcher " … must learn to use your life experience in your intellectual work: continually to examine and interpret it" (Mills 1968). But how can one do this? One answer is: one must set up a file, thus keep a journal because systematic reflection demands it (Mills 1968).

Setting up a file

Of the existing materials on the problem one is investigating, one will find in the files one is keeping at least the following (Mills 1968):

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- Several theories (explanations) having to do with the topic, eg from a functionalist, conflict or symbolic interactionist perspective.
- Materials already worked up by others as evidence for those theories.
- Materials already gathered and in various stages of accessible centralization, but not yet made theoretically relevant.

At one point in the course of one's research one will be finished with the materials consulted on the topic. Whatever one needs from them, is in the notes in the different files. From the notes one should then embark on the following (Mills 1968):

- Re-arrange the files, mixing up the contents and re-sorting them in order to be receptive to unforeseen and unplanned linkages, or what Merton (1968) refers to as the serendipity pattern: " … the unanticipated, anomalous and strategic datum which exerts pressure upon the investigator for a new direction of inquiry which extends theory."
- Classify and cross-classify the information by searching for common denominators and for differentiating factors within and between them. Consider extremes and construct polar or opposite types along various dimensions, e.g. despair – elation; miser – spendthrift.
- Get a comparative grip on the materials, e.g. examine how the existence of poverty shapes the social structures and social functioning of two or more societies over time and how it leads to similarities and differences.
- Write down one's findings. "To write is to raise a claim for the attention of readers" and " … to claim for oneself at least status enough to be read" (Mills 1968). Keep in mind that any writing " … that is not imaginable as human speech is bad writing" (Mills 1968).

Notwithstanding the aforementioned filing-method the following tools could also be utilized for the analysis of qualitative data:

- Successive approximation.
- Illustrative method.
- Analytic comparison.
- Domain analysis.
- Ideal types.

Successive approximation

With *successive approximation* a reseacher begins with research questions and a framework of assumptions and concepts. He/she asks questions about the evidence to see how well the concepts fit the evidence and reveal features of the data. New concepts are created by abstracting from the evidence and adjusting concepts to fit the evidence better. Additional evidence is then collected to address unresolved issues that appeared in the first stage, and the process is repeated. At each stage the evidence and the theory shape each other (Neuman 1994, Mills 1968).

Illustrative method

With the illustrative method a researcher applies theory to a concrete historical situation or social setting, or organizes data on the basis of prior theory. Preexisting theory provides the empty boxes. The researcher sees whether evidence can be gathered to fill them. The evidence in the boxes confirms or rejects the theory, which he or she treats as a useful device for interpreting the social world. The theory can be in the form of a general model, an analogy, or a sequence of steps (Neuman 1994).

Analytic comparison

The method of agreement and the method of difference form the basis of analytic comparison in qualitative data analysis. The researcher does not begin with an overall model consisting of empty boxes to fill with details. Instead, one develops ideas about regularities or patterned relations from preexisting theories or induction. He or she then focuses on a few regularities and makes contrasts with alternative explanations. One looks for regularities that are not limited to a specific setting (time, place, group). One is not seeking universal laws, only regularities within a social context. For example, one will look for a pattern within all late twentieth-century Czech urban public schools, not a causal law that applies to all educational organizations or all bureaucracies (Neuman 1994).

Domain analysis

The basic unit in a cultural setting is called a domain. By analyzing domains, e.g. *folk domains* (focus on language and usage), *mixed domains* (folk terms, but the researcher adds his or her own concepts) and *analytic domains* (terms from the researcher and social theory) the researcher could infer meaningful categories and identify patterns from observations and even artifacts, then assign terms to them (Neuman 1994).

Ideal types

Ideal types are models or mental abstactions of social relations or processes. They are pure standards against which the data or reality can be compared, e.g. *Gemeinschaft* and *Gesellschaft* (Neuman 1994).

Data analysis : quantitative research

In analyzing quantitative data one has to organize the data into charts or tables, or summarize them with statistical measures. Statistical analysis is used to test hypotheses and answer research questions (Neuman 1994). When one is doing empirical research the numerical results obtained from different groups of subjects (samples) are studied and compared. In this context, the following two types of statistics are commonly used:

- Descriptive statistics.
- Inferential statistics.

Descriptive statistics

When numbers tell one something about a particular group of repondents, they are called *descriptive statistics* (Bunker et al. 1975). *Descriptive statistics* is a method for describing and presenting quantitative data in a manageable form (Babbie 1990). The tools to make descriptive statistics manageable are the following (Bunker et al. 1975, Babbie 1990, Bloom 1986):

- Summarizing univariate data (data reduction) from unmanageable details to manageable summaries, eg averages such as the *mode*, the *median*, the *mean*. Another example will suffice : the age of the respondents varies from 20 to 40 years. Reduce the various ages of the respondents as follows: 20–25, 26–30, 31–35, 36–40.

- Measures of association. The association between any two variables (e.g. poverty and income) can be represented by a data matrix produced by the joint frequency distributions of the two variables. Different levels of measurement can be used, viz. nominal, ordinal, interval and ratio.

Inferential statistics

When numbers are used to tell one something about the extent to which two or more groups differ, they are called inferential statistics (Bunker et al., 1975:50). Inferential statistics, viz. univariate, bivariate and multivariate analysis assists one in drawing conclusions from one's observations from the study of a sample drawn from a population, e.g. prostitutes (Bunker et al. 1975; Babbie 1990, Bloom 1986).

Univariate analysis

Univariate analysis is the examination of the distribution of cases on only one variable at a time. It serves the purpose of describing the survey sample and, by extension, the population from which the sample was selected (Babbie 1990, Theodorson and Theodorson 1970).

Bivariate analysis

With bivariate analysis there are two measurements for each item, for example, the income and years of education of each subject studied (Theodorson and Theodorson,1970).

Multivariate analysis

The analysis and interpretation of the interrelationships of three or more variables are called multivariate analysis. This may be done by introducing an intervening variable into the analysis of the relationship between two variables, by successfully controlling on a series of variables, or by the use of techniques such as factor analysis (Theodorson and Theodorson 1970).

Selection of appropriate test statistics

Various tests to determine statistical significance could be carried out, inter alia a *t* test*, factor and chi-square* tests.

T test

A *t* test is used to determine the probability that a statistic (the summarizing value for a sample) obtained from sample data is merely a reflection of a chance variation in the sample rather than a measure of a true population parameter (Theodorson and Theodorson 1970). The *t* test can be applied to an independent variable measured on a nominal or higher scale and a dependent variable measured on an interval or ratio scale. In order to use the *t* test, three assumptions must be made (Lin 1976):

- That the samples are simple random samples from the groups defined by the categories of the independent variables in the population.
- That the dependent variable is normally distributed in each of the groups in the population.
- That the variances of the dependent variable in the groups are the same.

Factor analysis

Factor analysis is the statistical procedure used to determine correlations among variables (factors). Those variables that are highly correlated with each other are regarded as representing the same factor, and the extent to which each variable has a greater or lesser ability to measure this factor is indicated. When measurements of a large number of variables have been obtained, factor analysis may be used to reduce them to a smaller number of basic types or factors. If one assumes that a single construct (e.g. unemployment) accounts for a correlation among a set of indicators, factor analysis provides a way for testing this hypothesis (Theodorson and Theodorson 1970; Babbie 1990, Neuman 1994).

Chi-square test

The chi-square test, which is based on the null hypothesis (the assumption that there is no relationship between the two variables in the total population), is devised to determine the probability of differences between observed and theoretical, or expected, frequencies being due only to chance or being large enough to be statistically significant. A chi-square test may be used with one sample to determine the goodness of fit between any hypothesized distribution and the distribution that is actually observed. However, more often it is used with two or more samples to determine if the samples differ significantly in the relative frequency of cases in each of a series of categories (Theodorson and Theodorson 1970, Babbie 1990, Bless and Kathuria 1993, Mitchell and Jolley 2001).

Provisional structuring of chapters

As an example, the following title was formulated at the beginning of this article: A People-Centred Appoach to Alleviate Poverty and Sustain Development in South Africa.

Accordingly, the various chapters of a mini-dissertation, thesis or dissertation could provisionally be structured as follows:

CHAPTER 1 : INTRODUCTION
1.1 INTRODUCTION
1.2 PROBLEM STATEMENT AND CONTEXTUALIZATION
1.3 AIMS OF RESEARCH
1.4 THEORETICAL STATEMENT
1.5 METHOD OF RESEARCH (RESEARCH TOOLS)
1.5.1 Qualitative content analysis
1.5.2 Theoretical orientation
1.5.3 Qualitative research methods
1.5.3.1 Participant observation
1.5.3.2 Interviewing
1.5.4 Quantitative research methods
1.5.4.1 Survey
1.5.4.1.1 Population and sampling
1.5.4.1.2 Measuring instrument : questionnaire
1.5.4.1.3 Data analysis
1.5.4.1.4 Selection of appropriate test statistics
1.5.4.1.5 Characteristics of the research group
1.5.4.1.5.1 Age profile
1.5.4.1.5.2 Sex profile
1.5.4.1.5.3 Qualification profile
1.6 CONCEPTUALIZATION
1.6.1 The concept *people-centred approach*
1.6.2 The concept *poverty*
1.6.3 The concept *sustainable development*
1.7 ORGANIZATION OF THE STUDY

CHAPTER 2 : A FUNCTIONALIST, CONFLICT AND SYMBOLIC INTERACTIONIST PERSPECTIVE ON POVERTY
2.1 INTRODUCTION
2.2 A FUNCTIONALIST PERSPECTIVE ON POVERTY
2.3 A CONFLICT PERSPECTIVE ON POVERTY
2.4 A SYMBOLIC INTERACTIONIST PERSPECTIVE ON POVERTY
2.5 SUMMARY

CHAPTER 3 : THE EXTENT, CAUSES AND CONSEQUENCES OF POVERTY IN SOUTH AFRICA : AN EMPIRICAL INVESTIGATION
3.1 INTRODUCTION
3.2 THE EXTENT OF POVERTY IN SOUTH AFRICA
3.3 THE CAUSES OF POVERTY IN SOUTH AFRICA : VERIFYING QUALITATIVELY AND QUANTITATIVELY THE ASSUMPTIONS OF A FUNCTIONALIST, CONFLICT AND SYMBOLIC INTERACTIONIST PERSPECTIVE ON POVERTY
3.4 THE CONSEQUENCES OF POVERTY IN SOUTH AFRICA : VERIFYING QUALITATIVELY AND QUANTITATIVELY THE ASSUMPTIONS OF A FUNCTIONALIST, CONFLICT AND SYMBOLIC INTERACTIONIST PERSPECTIVE ON POVERTY
3.5 SUMMARY

CHAPTER 4 : A PEOPLE-CENTRED APPROACH TO ALLEVIATE POVERTY AND SUSTAIN DEVELOPMENT IN SOUTH AFRICA
4.1 INTRODUCTION
4.2 CHARACTERISTICS OF A PEOPLE-CENTRED APPROACH
4.2.1 APPRECIATION
4.2.2 INFLUENCE
4.2.3 CONTROL
4.3 AN APPLICATION OF A PEOPLE-CENTRED APPROACH TO ALLEVIATE POVERTY AND SUSTAIN DEVELOPMENT IN SOUTH AFRICA
4.3.1 SUSTAINING APPRECIATION
4.3.2 SUSTAINING INFLUENCE
4.3.3 SUSTAINING CONTROL
4.4 SUMMARY

CHAPTER 5 : CONCLUSIONS AND RECOMMENDATIONS
5.1 INTRODUCTION
5.2 CONCLUSIONS
5.2.1 A FUNCTIONALIST, CONFLICT AND SYMBOLIC INTERACTIONIST PERSPECTIVE ON POVERTY
5.2.2 THE EXTENT, CAUSES AND CONSEQUENCES OF POVERTY IN SOUTH AFRICA : AN EMPIRICAL INVESTIGATION
5.3 RECOMMENDATIONS
5.3.1 A PEOPLE-CENTRED APPROACH TO ALLEVIATE POVERTY AND SUSTAIN DEVELOPMENT IN SOUTH AFRICA
5.3.1.1 GUIDELINES TO SUSTAIN APPRECIATION
5.3.1.2 GUIDELINES TO SUSTAIN INFLUENCE
5.3.1.3 GUIDELINES TO SUSTAIN CONTROL

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Simultaneously published in Kontakt 4, no. 2/3.

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