

Science, Social Research, and the Scientific Approach**Anas Danasabe Abubakar**Department of Sociology, Faculty of Social Sciences, Ibrahim Badamasi Babangida University,
Lapai, Niger State, Nigeriaaadansabe@ibbu.edu.ng**Abstract**

Understanding the world is a complex but interesting exercise. Science, as a method of enquiry, offers a unique approach in exploring the world. Many who have towed the path of scientific enquiry attest to its unrivalled rigour and its ability to produce reliable knowledge and solutions to social problems. As such, science becomes the guiding principle of any serious investigation or research. Given the nature of the cosmos, science splits its investigative adventure into two – the natural and social scientific enquiries. This categorisation allows for in-depth scientific inquiry in each of the realms. This paper examines the scientific underpinnings of social research via a critical examination of the scientific approach. The paper utilises secondary research design where materials were assembled and filtered for use from existing literature on social research and scientific approach. Content analysis was used to extract the relevant aspects of each material utilised for the study. The paper argues that, essentially, social research deals with human behaviour. As such, it differs from the natural science research which deals with the cosmos. Social research is classified using five different criteria, each of which gives rise to various other types of social research. The type of research being executed dictates what method is to be adopted in the process of data collection and analysis. In the concluding part, the paper examined the scientific method of conducting social research and concurrently uses the work of Homey, Osgood and Marshall to buttress each step of the scientific method.

Keywords: Knowledge, Science, Scientific Approach, Social Research, Sociology**INTRODUCTION**

Research is an intellectual exercise seeking to bring forth a solution to a problem or broaden the horizons of knowledge through interrogation and discovery of the unknown. In sociology, this exercise (i.e. research) is fundamental to the development of theories and understanding the social world. As such, tremendous efforts are invested careful planning and execution of research by scholars and students alike. Research sharpens and validates existing knowledge or replaces them when new ones emerge. Amzat and Omololu (2012) assert that the foundation of sociology is rooted in theory and research. Therefore, sociologists are expected regularly engage in research activities to advance knowledge and solve social problems.

The foregoing background places social research at the heart of the sociology. Sociological theories and postulations emerge from social research. Therefore, the role of social research in the field of sociology cannot be trivialised. Nevertheless, the conduct of research in sociology is not

without standard procedures. These procedures are designed scientifically to produce reliable results and logical conclusions. Hence, science as the reliable means of gaining knowledge influences the entire process of social research (from the point of conceiving the problem, designing its method of study, collecting and analysing data, to drawing conclusion). Given this overbearing influence of science in sociological research, it informs the emergence of the concept of *Scientific Method* (Little and McGivern, 2014). The scientific method is otherwise known as the scientific approach. The scientific method is the concept used to denote the ideals which must be adhered by social researchers in designing and executing any form of social research. Berger (1963: p.16) quoted in Neuman (2014) succinctly conveys it thus: *The sociologist, then, is someone concerned with understanding society in a disciplined way. The nature of this discipline is scientific. This means that what the sociologist finds and says about the social phenomenon he studies occurs within a certain rather strictly defined frame of reference.* Thus, the scientific method or approach has also come to be synonymous with social research.

Objective of the Study

The paper examines the three interconnected concepts of science, social research and the scientific approach in accomplishing a successful sociological investigation.

METHODOLOGY

The paper utilised a secondary research design and extant literature on science, social research, sociology, and the scientific method were used to present the argument of the paper. Literature were sourced from published peer-reviewed papers, and textbooks on the subject matter. Content analysis was used to analyse the selected papers and the results were presented in line with the key themes in the study objective.

LITERATURE REVIEW

Meaning and Classifications of Science

Science has been defined in numerous ways. Nevertheless, all definitions proposed by scholars are united in explaining the subject matter of science. According to Horton and Hunt (1984), science is a body of organised, verified knowledge which has been secured through scientific investigation. The foregoing definitions treat science as an entity, i.e. body of knowledge. However, science is not only a collection of research findings; science is a *process*... (Kuhn, 1962). Through this

process, the body of knowledge is discovered. According to Osuala (2001), science is an organised body of knowledge as well as a method and system of deriving truth. In this definition, science goes beyond being a body of knowledge and encompasses the process through which such knowledge is generated. In their contribution to the discourse on science, Muhammad-Baba and Abubakar (2012) opine that science is a method of study whereby a body of organised, verified knowledge is discovered. This submission is in conformity to the submission of Osuala (2001). To sum up these postulations, science can be defined as a body of knowledge produced via careful reasoning and collection of necessary data with the aim of producing reliable knowledge about the physical or social world or both.

It is important to note that the subject matter of science is enormous and needs to be partitioned for effective enquiry into each aspect. Thus, science is classified into physical science and social science (Ballentine & Roberts, 2011). The physical or natural sciences deal with the physical aspect of the world while the social sciences deal with the behavioural aspects of man. This categorisation gives each of the branches of science a sense of focus and helps it to better understand any phenomenon of interest within its realm. Social sciences are also called “soft sciences” because they study human social life which is highly fluid, formidable to observe and difficult to measure precisely (Neuman, 2014). Balarabe-Kura and Dantake (2015) assert that social science is primarily concerned with the study of human society and individual relationships in their societies. They emphasise that the social sciences deal with socio-cultural, political and economic aspects of human behaviour. Sociology belongs to the social sciences given its subject matter – human interaction and behaviour in social groups.

Science and Social Research

Research is a daily routine embarked upon by many people. Sometimes, it can be a casual exercise while at some other time, it is a rigorous scientific exercise. It all depends on the intent and training of the researcher. Here, the focus is on the scientific research. Scientific research is a structured inquiry that utilises acceptable scientific methodology to solve problems and creates new knowledge that is generally applicable (Grinnell, 1993). Grinnell’s definition offers a good illustration of what research aims to achieve. From the definition, it can be depicted that science guides and directs empirical investigation seeking to understand relationships between or among physical or social phenomena. During the investigation, scientific ideals are utilised in order to

arrive at a logical conclusion. This implies that no valid research activity takes place outside the realm of the scientific method.

As mentioned by Ballentine and Roberts (2011) in the preceding section, science is broadly categorised into two, physical/natural and social sciences. This implies there are two areas of research as well. They are the physical sciences research and the social research. In this piece, the aim is to explore the social research component of the classification. Social research is defined as the type of research concerned with the investigation of social phenomena. For Abdulrahman (2012), social research is a careful and systematic attempt to study particular phenomenon so as to increase or modify the stock of knowledge about them. Specifically, he noted that social research is concerned with the origin, nature, character and consequences of specific social phenomena. Similarly, Neuman (2014) describes social research as pervasive and affecting the lives of various individuals in the society. Kumar (2011) notes further that social research must be controlled, rigorous, systematic, valid and verifiable, empirical and critical in order to qualify as a scientific research. Social research is often distinguished by its designs such as survey, case studies, historical studies, etc. Therefore, all researches dealing in the behavioural aspects of human existence is categorised under social research. This includes researches in the areas of sociology, anthropology, economics, political science, etc. Therefore, this gives social research a broad scope given that human behaviour is also broad in scope.

FINDINGS AND DISCUSSION

Types of Social Research

There are various criteria used in classifying social research. In this article, the classification of Neuman (2014) will be examined. According to Neuman, there are five criteria used in the classification of social research. They are:

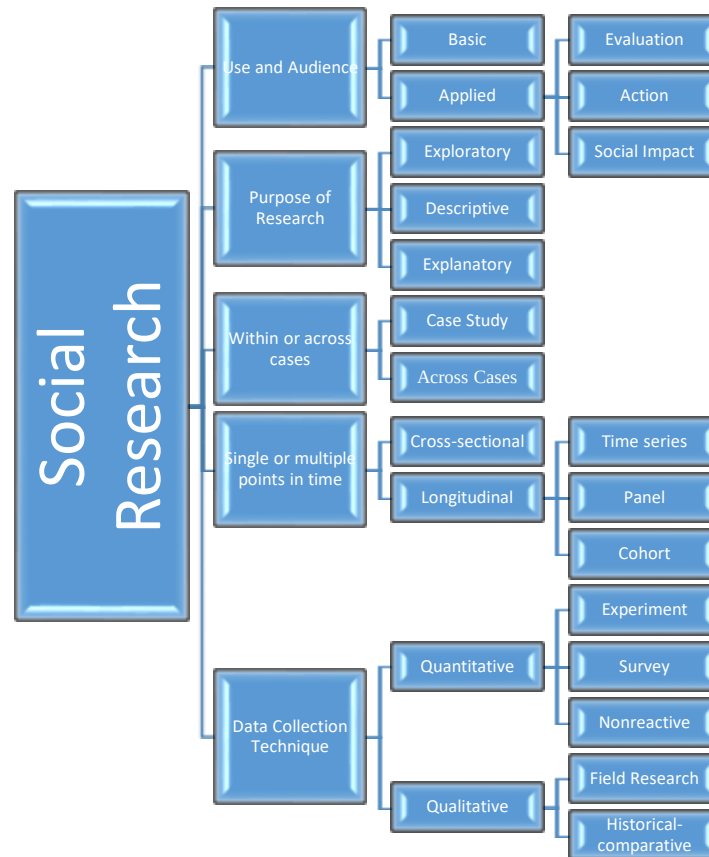
- i. **Use and audience of research:** this criterion classifies social research into basic and applied research. Basic research deals with expanding the horizons of knowledge. It is also called academic or pure research and focuses on how the world works. While applied research engages practical ways of solving real life problems. Applied research can also be further categorised into three. They are evaluation, action, and social impact.
- ii. **Purpose of research:** in terms of the purpose of conducting a research, three distinct types of social research are identified. They are exploratory, descriptive and explanatory research.

The exploratory research seeks to explore new facts on which only little information is known. It basically addresses the “what” question. Descriptive study seeks to describe a phenomenon under study. It focuses on the *how* and *who* questions of research. It aims to provide a detailed and highly accurate picture of the phenomenon under study. Lastly, the explanatory research tests a theory in order to elaborate and enrich its explanatory power. This type of research seeks to answer the *why* of a research.

- iii. **Within or across cases:** using this criterion, social research is typified into case study research or across cases research. In case study research, the research focuses on a many features of a single unit of analysis which may be an individual, group, or even a society. On the other hand, when studying few features of many units of analyses (cases), the research is said to be an *across cases* study.
- iv. **Single or multiple points in time:** this classifies social research into cross-sectional, and longitudinal types of research. In cross-sectional studies, the researcher studies many units at a particular point in time. It is like a snapshot of events which cuts across the different segment of the study population. In longitudinal research, the researcher studies many points at a multiple time in order to generate a *moving picture* of the event or phenomenon under study. Longitudinal studies are further classified into time-series, panel and cohort studies.
- v. **Data collection technique:** this criterion classifies social research into quantitative and qualitative types of research. The quantitative type of social research collects numerical data and utilises it to make inferences and generalisations. This type of research uses large samples and employs some statistical techniques in the analysis of data. Researcher in this category include survey, experiment and nonreactive studies. The qualitative type of research collects and utilises non-numerical data which are often in the form of observations, open-ended interview, etc. qualitative data uses smaller sample compared to quantitative studies and provides a richer description of the studied phenomenon.

Each of the foregoing criteria generates different types of social research. However, it must also be mentioned that there could be possibility of having two or more criteria determining the type research. For example, a research can be quantitative and at the same time exploratory. The diagram below summarises the types of social research using the five criteria.

Figure 1: Types of Social Research



Adapted from Neuman (2011)

Attributes of social research

- i. **It is planned:** every good research starts with a carefully designed plan which spells out details of the research from the commencement to finishing. An overview of the entire process and steps of the research is usually provided in a *Research Proposal*. The proposal states what the researcher intends to do, how the chosen task would be executed and at what time they would execute it.

- ii. **It is purposeful:** the purposefulness of a research answers the question “why” the research is being conducted. The problem statement introduces this. Furthermore, the research objective(s) complement the problem statement through and gives it a source of direction. The objective(s) hence provide the justification or purpose of the research.

- iii. **It is systematic:** research is systematic because it is a process broken down into several clearly logically defined steps. All research activities are arranged sequentially and every step is

carefully executed using the scientific methods. For example, a researcher cannot proceed with data collection without deciding and stating the problem he/she wants to study. The use of these scientific methods allows the researcher to arrive at logical conclusions.

- iv. **Objectivity:** this means that the research must be carried out without bias. Researchers are expected to report all findings without manipulation either for fear or favour. It must reflect the reality on ground without twisting it. So, findings from the study would be based on the nature of what was studied rather than on the personality, beliefs and values of the researcher. Any research which violates the principle of objectivity would eventually be misleading.
- v. **Accuracy:** this means that the research findings must be true, correct and free from error. All the tools and instruments used must be appropriate for the research in order to have a valid result. Therefore, the method is of paramount importance here as it is what will guarantee the audience of a sound research report.
- vi. **Reliability:** this implies that the findings of a research must be repeatable. That is, if the research were to be done a second time, it would yield similar result.

The Scientific Method

Lundberg (1942) rightly observes research as a daily exercise embarked upon by many people. However, he states further that the difference between scientific research and the daily routine research is in the use of the scientific method. Lundberg categorically asserts that “*Scientific methods consist of systematic observation, classification and interpretation of data. Now, obviously, this process is one in which nearly all people engage in the course of their daily lives. The main difference between our day-to-day generalisations and the conclusions usually recognised as scientific method lies in the degree of formality, rigorousness, verifiability and general validity of the latter*”. (Lundberg, 1942:5)

Ideally, sociological research follows this step-by-step procedure in the course of investigating its problem. In a nutshell, the scientific method consists of seven major steps. These steps will be explained concurrently with an example to illustrate practical application of each of the steps. In this regard, the sociological work of Homey, Osgood, and Marshall (1995) would be utilised.

i. Selecting a Researchable Problem

There are various aspects of human behaviour that can be studied scientifically. Sociologists focus on problems that merit study and that can be investigated by the methods of science. This implies that there are problems which may not be investigated effectively using the scientific method. As such, only problems that avail themselves for scientific investigation are selected. In their work, Homey and her colleagues were intrigued by the great stability of patterns of criminal behavior; people who establish patterns of criminal activity in their youth tend to follow these patterns throughout their lives. Is this because some people have a basic propensity to commit crime? Or do patterns of life circumstances that weaken or strengthen social bonds influence patterns of criminal offending? These questions are such that only a scientific research can effectively answer.

ii. Reviewing the Literature

Having selected a topic of interest, a sociologist then proceeds to review related literature to his intended study. This is to help him make sense of the problem at hand and be acquainted with the current state of knowledge on the problem. Homey and her colleagues surveyed the research literature dealing with criminal offending. This told them about other research that had been undertaken, suggested a variety of leads, and saved them from duplicating work others had already done. Their literature review uncovered two patterns of findings. One set of studies showed that people who commit crimes when they are juveniles are much more likely to commit crimes as adults, strongly supporting the conclusion “that a basic propensity to commit crime is established early in life and *perspective*. Another set of studies showed that people with strong social bonds (such as marriage) and important commitments (such as going to school and being employed) commit less crime. These studies, which suggested that patterns of offending should change over a person’s life, support a *social control theory*, or perspective, of crime: that social bonds prevent criminal offending.

iii. Formulating a Hypothesis

After reviewing the literature, researchers form a hypothesis regarding the relationship they believe exists between variables. A hypothesis can take the form of a predictive statement or of a question. Homey and her associates asked whether the likelihood of criminal offending (the dependent variable) is affected by formal and informal mechanisms of social control (independent variables). Answering this question would enable the researchers to decide which alternative view of crime was more plausible. If, for example, they found that having strong family relationships was

followed by a reduced likelihood of committing a crime, this would support a social control perspective. A finding of no relationship between social bonds and the likelihood of crime would support the criminal propensity perspective.

Before undertaking their research, however, researchers must define their variables. In developing operational definitions, scientists take abstract concepts and put them in a form that permits their measurement. In this case the researchers specified how “strengthening and weakening of social bonds” and “committing a crime” would be measured. For this study, crime was operationally defined as committing any of nine felonies (auto theft, burglary, personal robbery, business robbery, theft, assault, forgery, fraud, and drug dealing). Homey’s *operational hypothesis*—a hypothesis stated in terms of measurable variables—was this: persists throughout the life course,” with life events having little or no effect on adult crime. This idea is called the *criminal propensity*. The likelihood of committing any of nine different felonies is affected by living with a spouse or partner, being employed, going to school, being on probation or parole, drinking heavily, or using drugs.

iv. Choosing a Research Design

Once researchers have formulated their hypothesis, they have to determine how they will collect the data that will provide a test of it. Homey and her colleagues decided to conduct interviews with newly convicted male offenders and ask them about events and criminal behaviors in their lives over the two calendar years preceding the year of the arrest that led to their incarceration. The choice of research design is informed by the nature of the study and the ability of the chosen design to answer likely questions to be raised.

v. Collecting the Data

This is a very critical aspect of the research process. The data collected forms the basis for any conclusion that might be drawn from the study. Homey and her associates conducted interviews with 658 male offenders sentenced to the Nebraska Department of Correctional Services. Because the offenders were reporting on their own past behavior, some of it criminal, the investigators had to work to gain and maintain the confidence of their subjects to assure honest reporting. The survey instrument included an “event calendar” and a “crime calendar,” which allowed the researchers to record life circumstances and criminal behavior during the months covered by the study.

vi. Analyzing the Data

Upon successful collection of data, researchers must commence analysis. The analysis method is determined by the type of data collected. The analysis helps to find answers to the questions posed by the research. Analysis involves a search for meaningful links among the facts that have emerged in the course of the research. Homey and her colleagues chose an analysis that would show whether changes in life circumstances were correlated with committing criminal acts at a later time. Further, in order to rule out criminal propensity as a cause of both the life changes and the criminal acts, they examined these correlations within three subsets of offenders, those with low, medium, and high rates of criminal offending. The findings of this study showed that regardless of overall levels of offending, men were less likely to commit crimes when living with a wife and/or attending school. Illegal drug use, heavy drinking, and living with a girlfriend all were associated with higher rates of offending.

vii. Stating Conclusions

After completing their analysis of the data, researchers are ready to state their conclusions. They typically accept, reject, or modify their hypothesis. Additionally, researchers usually seek to extract broader meaning from their work by linking it to other knowledge and theory. In this case, Homey and her colleagues found that “changes in offending systematically follow changes in . . . life circumstances.” Their results support social control theory by showing that, even among men with a strong propensity to commit crime, the strengthening and weakening of social bonds affects the likelihood of criminal activity. Criminal acts, therefore, are not produced just by the propensity to commit crime. “Our results,” they concluded, “suggest that differences [in the propensity to commit crime] among individuals combine with their shifting social environments to produce current levels of criminal activity.”

Conclusions drawn from research activities inform and influence the anticipated policy response. Therefore, with the right conclusions drawn from a research activity, a befitting policy can be made to tackle the issue which has been investigated.

CONCLUSION

The paper was informed by the need to explore the connection between science, social research and the scientific method. The paper situates the foundation of any reliable research activity within the purview of science. Science prescribes what must be done, how it should be done and at what

time such actions must be taken. Adhering to these principles of science implies the use of the scientific method. It is also worthy of mention that the scientific method is a point of convergence for both the natural and social sciences. That is, it is a template that guides all kinds of research activities whether in the natural sciences or social sciences. This explains why (social) research is said to be systematic. It is in various sequentially arranged stages and not a single stage can be omitted in the course of conducting the research. As such, the entire research process is guided and guarded by the scientific approach.

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