

Evolution of Research Methodology in Social Science: Tracing the trajectory for the pursuit of Knowledge

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Abstract:

This paper reveals the evolution of Research methodology especially in social sciences. It focusses on tracing the trajectory for the pursuit of Knowledge. Research has a long History but there was not proper sequencing and interpretation of research methodology in academia. First tracing the roots from Indian Philosophical Grounds and others researches which happened in Ancient Era and after that tracking European social research methods from Pre-history and world war influence to make Research methodology more equipped. There have been a lot of researchers and scientists in Indian Society who discovered and invented many things but not through the proper methodology.

This paper tracks the reasons for evolution of research methodology and its diversification in contemporary settings. Later it also traces the methodology in sociology as a discipline to analyse social phenomena. Further it will also be helpful to get a better understanding about SRM and its reasons to emerge.

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Introduction

Evolution of Human Civilization is biological in nature, but from an ontological lens it can be said that seeking knowledge and truth and the ability to think on our thoughts makes us distinct and true human beings. Our consciousness serves the possibility to hunt for better reasons, better knowledge, and a significantly more relaxing lifestyle. The quality or state of being aware especially of something within oneself (Merriam-Webster, n.d.). Our consciousness always pushes us to go for the ideas that emancipate us from different problems and phenomena of day-to-day life. Discussing consciousness would be a bit difficult for us because it put a hurdle to explaining why this consciousness happens, mind-body dualism, etc. From seeking this, we can trace the emergence of our whole academia. From Philosophy to History to Mathematics to Psychology all come from a single point 'Consciousness'. Truth-seeking, questioning, and rationality all come from a single point. If Interpreting Biologically, we can say that human consciousness is the first thing for a human to take part in research just like the first unicellular organism which is produced from a chemical reaction and other 'vital force'. The only motive of this analogy is to compare or trace the evolution of research and its methodology in social sciences. Evolution is the nature of 'nature' to make things simple to complex, from homogeneity to heterogeneity, indefinite incoherent homogeneity to a definite coherent heterogeneity, during which the retained motion undergoes the parallel transformation (Spencer, 1883). Technically it is very obvious to social sciences how it comes to more than one thousand subjects from one subject philosophy. Human grows together with their consciousness, then reason and the then better result is just like a chain reaction. It is clear how we are distinct from other animals and what we have done throughout history. The evolution of research should come with the outer reason i.e why this happens with related to external stimuli. Evolution has never been done in an empty box but with outside conditions and so with history. History is not just a collection of facts, and figures but also a proper interpretation of how this change comes into place with the series of events. There is some interchangeability of ideas and usage of these terminologies while explaining the history or evolution of research. The idea behind the word evolution is to track the complexity and interventions of circumstances that is responsible for a better research method and a proper methodology. The reason for tracing the trajectory is simply to predict the upcoming research methodology and its implications for the betterment of research.

On the other hand, we will discuss and trace the lines in research and its methodology. The article traces back the history of research from its earliest point drawing insights from the works of literature in academia. Social science research is a method to discover facts in societies. Through social research new knowledge is derived. Today research has become important for a better understanding of the world and newly emerging social problems and through research, we can derive solutions to their problems. In particular, while existing histories of research tell us about many theories, there is no logical explanation for this how they evolved. To meaningfully discuss the evolution of research, it is necessary to break it down into parts. The research is always determined by the historical context of its evolution. India is one of the oldest civilizations in the world and has one of the largest traditions of research. Research tradition has a long history from the time of Vedas in the field of research but most researches of that time do not have any proof.

Indian Roots

We can trace Social Research Methodology from Indian roots. The word ‘research’ reflect the meaning of old Sanskrit word ‘*gaveshana*’. (Oxford Essays Contributed by Members of the University, 1856). The sources of knowledge in India are very Indigenous in Nature. We have Rig Veda which builds the definition of Knowledge and Research. Early Research done in India can be tracked by Baudhayana (800 BC - 740 BC) who is said to be the Original Mathematician behind the Pythagoras theorem. In his major work Sulba Sutras, he used an example of rope to determine the area of the right-angle triangle way before Pythagoras. The value of pi was first calculated by him (Baudhayana). Aryabhatta was a fifth-century mathematician, astronomer, astrologer, physicist, and founder of zero as a concept and symbol. He was a pioneer in the field of mathematics. At the age of twenty-three, he wrote *Aryabhattachiya*, which is a summary of mathematics of his time. (Billard, 2020). In the 7th century, Brahmgupta took mathematics to heights by introducing negative numbers and operations on zero into mathematics in his book *Brahm Sputa Siddantika*. (Bradley, 2006). Bhaskaracharya from the 12th Century authored a book *Siddhanta Shiromani*. Jain Guru Mahaviracharya wrote *Ganit Sara Sangraha* in 850 A.D., which is the first textbook on arithmetic in present-day form. (Rangacharya, 1912). Similarly in Science Kanad was a sixth-century scientist at Vaisheshika School, one of the six systems of Indian philosophy. His atomic theory can be a match to any modern atomic theory. According to Kanad, the material universe is made up of *kanas*, (anu/atom) which cannot be seen through any human organ. These cannot be further

subdivided. Thus, they are indivisible and indestructible. (Sharma, 2000). Varahamihira in his *Brhat Samhita* contributed to the fields of hydrology, geology, and ecology. (Evans, 2014). Nagarjuna from the tenth century, In his treatise *Rasaratnakara*, has discussed methods for the extraction of metals like gold, silver, tin, and copper. In medical science, A treatise on Ayurveda, *Atreya Samhita*, is the oldest medical book in the world. Susruta, Charak, Madhava, Vagbhatta, and Jeevak were noted, as ayurvedic practitioners. In the first instance, all these inventions and discoveries are natural in nature but they all give a strong foundation to today's modern research and their result. The question is not what they get to know about these discoveries, inventions, and problem-solving. The real question is how they get there to the ultimate truth? What are the methods of inquiry they used? What are the methodologies? For now, we can say that there is no proper conduct of any research methodology that these scientists used to get the absolute truth. It will not be a harsh comment to say that they are independent of their research, their findings, and their methods to accomplish goals. In concrete, no proper code of conduct lead to some astonishing findings which couldn't be developed from formal training of research. There are some basic principles that early Vedic literature provided to infer reality but it is hard to say that all these scientists or researchers followed those paths. The research at that time was very philosophical in nature later it turned out to be scientific in nature. You can 'search' a pant in your room in a couple of minutes but the 'research' behind pants took a thousand years of human intellect. That is the key difference between a search and research. Research is always a continuous process because it is to be believed that Knowledge or *Param-Gyan* can't find out to be by simple 'search'. It needs focus, attention, orientation, dedication, and sacrifice, or in other words *tapasya* (Prabhupada, 2004). Tapasya is something by which you can connect your soul to the ultimate god (*aatma-parmatma milan*) (ibid., p376). By connecting to supreme or in more scientific terms 'energy' anyone can attain the absolute truth. This is the prescribed method to attain knowledge from this metaphysical word. The nature of the method doesn't sound scientific but at an early age, our rishi-muni and other scientist used this method to do research which is a continuing process. Dhyan-Yoga, the Trial and Error method, and a deep insight observation about the metaphysical world give us an understanding of the different phenomena and explanations. For instance, here are two shlokas from Indian scriptures on how true knowledge is established about any subject, especially spirituality: *Pratyaksha Anumana Agamah Pramanani* (Patanjali, n.d.) There is a good example of Srinivasa Ramanujan who discovered alien equations of Infinite number series, gama function, the elliptic integrals, hypergeometric series, and the

functional equations of the zeta function, Ramanujan summation, and many more mathematical equations without any formal training in mathematics. He stumped English mathematician G. H. Hardy at the University of Cambridge who was a great mathematician of his time. He stated about Ramanujan's early work 'It defeated me completely; I had never seen anything in the least like them before. (Hardy, 1940). When Hardy asked about Ramanujan and where these equations come into his head, without any formal proof or derivation Ramanujan simply gave credit to his family goddess Namagiri Thayar. He once said, "An equation for me has no meaning unless it expresses a thought of God." (Kanigel, 1991). It is also hard to say what the methodologies and specific areas are covered by great universities of that time Taxila and Nalanda. Panini, Chanakya, and Kumaralata were prestigious professors of these universities. Nalanda was violently destroyed in an Afghan attack, led by the ruthless conqueror, Bakhtiyar Khilji, in 1193, shortly after the beginning of Oxford University and shortly before the initiation of Cambridge (Sen, 2011).

The question of the several ways of pursuing research has been a subject of significant debate over the ages. However, many authors tried to explain the process and means of approaching research in line with the views laid down in the various schools of epistemology that existed in ancient India. Conventionally speaking, we have two different sets of schools of Indian epistemology based on the principle of 'authority of the Vedas' (Sanyal, 1983). The first set is called the (astika) orthodox system of thought. This system includes the six philosophical schools of Nyaya, Vaisesika, Samkhya, Yoga, Mimamsa, and Vedanta. These schools accept the Vedas as the source of valid knowledge. The second set that disapproves of the authority of the Vedas is called the (nastika) heterodox system of thought. This system includes the philosophical schools of the Carvakas, Bauddha, and Jaina.

Swami Virupakshanad asserts *Sankhya* as the most significant pillar from one of the six systems of Indian philosophy. The sage Kapila provided the concept for the Sankhya school of thinking. In his commentary on Sankhya Karika, Sankhya Tatva Kaumudi, and Vacaspati Mishra addresses the species and intricacies of research. He examines three different types of puzzles that exist and is the impetus for conducting research. As a result, there is a desire to begin looking into the solutions to these puzzles. He argued for the value and need of conducting research. After requesting them from the Sankhya Karika, he provides the five steps of any investigation. These milestones are the steps that each person must pass through to undertake any research. The first stage of research is Taram- the preliminary study of the subject to be studied by seeking the opinion of a qualified teacher (Tattva-Kaumudi (Sankhya)

of Vachaspati Misra, 1896). It involves the pramana of pratyaksha and sabda or direct or immediate knowledge that culminates in well-defined knowledge arising from contact of sense organs with objects. Sabda refers to verbal testimony (*upadesh*) of reliable people (*apta*) who are authorities on the subject concerned & willing to communicate on such matters as may be. Testimony, in the parlance of the Jaina philosophy, is known as agama and refers to knowledge of vyapti verified and established from the words of learned people. Sutaram is the second stage of any research (ibid). The word “anumana” is a combination of two Sanskrit words ‘anu-after and mana-measurements’. It involves the pramanas of anumana and arthapatti. It establishes the relationship between the facts like constants and variables facilitated by logical reasoning, and knowledge derived from this called inferential knowledge. According to Gautama, there can be two kinds of inference based on casual relations “Puravat and Sesavat”. Once a researcher made a preliminary-study he will postulate a specific idea and this step is known as arthapatti. Artha means fact and apatti stands for supposition. Knowledge which resolves the conflict between two facts by providing the supposition to it. Sutaram prepares the researcher for getting on with his further investigations ‘Tataram’ third stage of any research which involves reasoning based on a supposition or hypothesis. According to Vacaspati Mishra, Uruupa Tiritiya Tartaram involves the pramana of ‘rupumana’ Upamana is a combination of two Sanskrit words upa-near and mana-measurements’. In upamana, the researcher has access to the data (measures) and proceeds to draw relevance from the data through comparison and analogy. After this researcher establishes the validity of his findings through further reasoning. Bhava is the knowledge of being/positive assertion through anupalabdhi (perception) and abhava knowledge of non-being/negative assertion. Knowledge can be called valid if it holds true for both bhava and abhava. Ramyakh is the fourth stage of any research. Ramyakh is facilitated by Suhrtrapti. The word Suhrtrapti is a combination of two Sanskrit words, ‘Suhr’ meaning ‘well-wishers’ and ‘prapti’ which means ‘attainment’. A researcher needs to attain the company of like-minded people who are willing to share their views on his research so that he may establish the credibility of his research. Sadamuditam is the fifth stage of any research. (ibid) Research or any work of knowledge is not a means to personal achievement but an attempt towards contributing to the betterment of the world. He refers to the assertion given by the revered Patanjali “An unimpeded discriminative knowledge is the means to the suppression of pain”. Ignorance, disability, and contentment are fit to be abandoned as they are the causes for impediments to siddhi-success. These three acts as curbs on success in as much as they thwart success, says Vacaspati Mishra. Modern-day research

steps are implicit in the five stages approach of Samkhya Tattva Kaumudi. Samkhya Tattva Kaumudi gives us a more detailed and hands on approach to research. 'Nyaya Sutras' were formulated by an Indian Philosopher scientist Aksapada Gotama. Nyaya means analysis. The Nyaya Sutras, for establishing the fact, a phenomenon or an object consist of Pratyaksha (Perception), Anumana (Inference), Samadhi (Knowledge), Upamana (comparison), and Aptavakya (Testimony).

Methodological Uprising in Sociology

Sociology is a science of society and its phenomena. The emergence and development of sociology are caused by French Revolution and Industrial Revolution. Intellectual Scholars like Comte, Spencer, Durkheim, Weber, and Marx are the product of these two incidents. French Revolution creates a new shift to Liberty, Democracy from Monarchy for which chaos happened there. As a result, thinking and understanding society is equally important for that time and space thus sociology emerged as a discipline in France by August Comte. Karl Marx and Max Weber were highly influenced by Industrial Revolution and its consequences like Class Emergence, Rationality, and Conflict. It is often claimed that the rise of capitalism with the process of urbanization and industrialization gave impetus for empirical social research. A famous statement of Bierstedt stated as 'Sociology has a Long Past but Short History' (Bierstedt, 1970) So we discuss the Sociological Social Research Methods in Historical Perspective and its Development.

'Sociological knowledge aims to be general if not universal, whereas common sense is particular and localized'. (Beteille, 1966). Research Methodology is an integral part of every social science especially sociology. Most of the history and reviews threw light on theoretical developments but kept social research methodology in dark. Since Social Structures are so large and complex, it is inevitable to dig out crude reality and some generalization with social research. The research comes with new knowledge and new knowledge produces a more refined and elegant Research methodology and the cycle goes on and on. If we want to trace the history and development of sociological social there are several Phases in tracing the entire procedure of Social Investigation. It is to be noted that European countries is responsible for the emergence of Intellectual Capital and Social Research Methodology by conducting empirical social research for nearly two hundred years. It is a comprehensive history of social research methods because its history is unwritten and also a possibility that Social Research is

practiced in various disciplines and on all continents but it is hard to trace due to insufficient literature and authenticity. So, we can divide it into these subsections.

1. Early Pre-History (pre-1820)
2. Early History (1820-1900)
3. Development phase (1890-1930)
4. World War 2 and Post World War 2 Consensus (the 1930s-1980s)
5. The Contemporary situation (1970- present)

Early Pre History

‘Almost the very day on which the European feudal order suffered its first political defeat became the birthday of the first sociographic study’ (Zeisel, 1933). So, after the decline of the feudal system in Europe, new government decides to conduct censuses to collect facts about their people, their number, voting rights, fighting potential, and tax capacity. From the very first point census is the method which comes in the investigation of society. Chinese, Egyptians, Greek, Japanese, Persians, and Romans all comfortably practiced the survey method on their people. There is a manuscript record of the ‘Great survey’ named *Domesday book* of England by order of William I in 1086. It is hard to say these data collections as research but for analysis, some data is required which is easily collected by census. In the early 1660s there is an interest inclined for social numbers. It is the time in which European counterparts progressively chased scientific methods and parallelly put science in the service of social reform. Edmond Holly developed the first morality table which provides collective information on life span. French Philosopher Condorcet in his work *philosophe* discussed ‘Probability theory’ named Condorcet jury theorem in political science. This shows the social arrangements and sets some room for ‘chance’ and ‘free will’ of people. In 1801 objective of the census was to ascertain military manpower during the Napoleonic war as well as the issue raised by Malthus in his work *An Essay on the Principle of Population*. In India, this census method came way back later in the early 1900s by Britishers to gather caste data. There are many censuses were begun in Canada (1966), Denmark (1700), Sweden (1749) and USA (1790) (Bulmer, 1987).

Early History (1820-1900)

Not too late, State Realised that the emergence of new societies and new phenomena can't be dealt without proper methodological orientation and interaction with books and data in their official records. We can say that this was some shifting from census to survey. Social Survey grew with the concerns that emerged from industrialisation and urbanisation with the desire to investigate social reform. The population was increasing day by day and the state was emerging with its new responsibilities and power. So, it has to be in alliance with reformers and state statical officials. From here Investigators impacted upon data on both qualitative and quantitative lines. For example, unemployment emerged as a social problem and investigating these numbers is not sufficient to picturise the truth but also the quality and other 'qualitative phenomena' to some degree such as skill, behavioral attitude, and social background. These investigations help Karl Marx to write *Das Capital* in which he used the data from the official British Inquiry.

Moving to some qualitative research methods that were first 'scientifically' make a mark in the ethnographic world. First Female Sociologist Harriet Martineau's *Society in America* (1837) and *How to Observe Morals and Manners* (1844) were the first square in observational ethnography and reasonable study. The emergence of Industrialisation, Urbanisation, and Migration encouraged Engles for his work *Condition of the Working Class in England* (1845) in which he covers the class struggle, migration issues, and some crucial observations in Industrializing British Cities.

There was always a curiosity to know about the 'Fourth World' i.e Tribal Societies among Britishers. That was Diffusely described in the work Orientalism by Edward Said. In 1851 Morgan Published the first ethnography on Iroquois by a combination of field and theory. The earlier survey relied upon reports and data by others or pre-existing data and some sort of 'arm-chair' work. For a while there were a "Social Survey Movement" in England and the USA to understand the total community by empirical means, also it engages significant numbers of private, government, and academic researchers. (Gordan, 1973). These were part of social Reform but had little Sociological Significance.

At the end of the century, some methodological development happens with new upheaval. The method of data collection and schedule was not properly structured before. Probability sampling was invented in statistics and used by A.L Bowley in his study of five English towns in 1915. Charles Booth trusted multiple observers to crack complex phenomena rather than relying upon a single observer. Seebohm Rowntree directly interviewed families and used the

concept of life-cycle. Founding fathers of sociology (other than spencer) used data collection, and surveys to breach the hidden social reality. Even Marx developed his questionnaire to study French workers, Weber investigated Prussians Peasants from his questionnaire, and Durkheim used official statistics and archives to record information about suicides. Also, Market Research and Polling started in this period and published by newspapers and magazines which help in futher proceddings of SR.

Development phase (1890-1930)

After WW I American Sociology ‘became dominant quantitaively and qualitatively’ (Platt, 1996). WW emerged with patriotism that translates into by deepening of methodological standards in several areas. From here the development in RM is inclined towards more scientific, more accurately, and optimistically inclined. It is interesting to note that attitude measurements in market consumer behaviors like Thurston Scale. In 1920s and 30s Howthron's study by Henry A. Landsberg comes into the scene which shows how human behavior and productivity change in surveillance conditions. J.L Moreno developed network analysis in 1930s by using ‘sociograms’ which later turned into the approach ‘sociometry’. Crime incidents also gone high which results Psychology and Sociology studying under the umbrella of ‘Criminology’. Case study, Participant observation, In-Depth interview, and Socio-Psychological methods were first used during this time to investigate itinerant ‘hobo’ workers, youth gang, dancehall employees, Italians, Poles, Jews, French Canadians, Mexicans, and Chinese; and central city ‘gold coast’ apartment, artist colony, and rooming house dwellers. On the other hand, Ethnography took a new way in presence of Malinowski and his work *Argonauts of Western Pacific* published in 1922 with his idea of ‘Participant Observation’ which gives a more reliable interpretation from the perspective of the actor. Freud comes in a time zone with his most debatable yet most impactful study on psychoanalyzing in his books *The Interpretation of Dreams*, *The Ego and the ID*, and *Introduction to Psychoanalysis*.

World War 2 and Post World War 2 Consensus (1930s-1980s)

Second World War and its after-effects fuelled up with empirical research and a combination of different research methods i.e., interdisciplinary research happened during this time. Two Volumes of *The American Soldier* by Samuel Stouffer which was part of *Studies in Social Psychology in World War II* set a milestone for today's research proceedings. The concept of 'Relative Deprivation' by Robert Merton gives a brief socio-psychological understanding of deprivation in soldiers and analogous social humans. Till here we have proper Research methods and their proper understating with a step-by-step process in the book *Social Research* (1942) by George Lundberg. So doing research with a proper methodology and developing a new concept that unlocks a social phenomenon about human behavior and Collective behavior starts from here. Theory Building Comes from different concepts or can say a theory is a collection and warp weft of concepts. Talcott Parson was a Grand theorist who emphasized grand Structures which cover all the aspects and functionality of the entire Social Structure. Ethnomethodology and Phenomenology are two logy developed by Harold Garfinkel and Alfred Schutz respectively interprets the complex actions in day-to-day life and help to understand the subjective reality of the objective world and the objective reality of the subjective world. Attitude scales like Likert scale and Guttman scale developed in this period in response to individual experience and its findings to generalize individual-social reactions. Herbert Blumer inventor of symbolic interactionism criticized the statistical method and emphasized individual interpretation of 'core human actions. C. Write Mills with his new idea of 'Sociological Imagination' delivers the fresh air and criticized 'abstract empiricism'. Berger and Luckman introduced the term social Construction to make us understand that this world and its meaning are nothing but 'Social Construction' in his work *Social Construction of Reality* and this book is considered the fifth most important book of the 20th century.

The Contemporary situation (1970- present)

After 1970 there is a paradigm war and inventions of tools to analyze research data rather than methodological refinement. Introduction of Feminist Methodology appeared in this time which trusted upon to check reality apart from traditional 'malestream methodology' (Abbott, Wallece, & Tyler, 2005). In the 1980s and 1990s, it can be inferred that some complicated methods of multivariate analysis were applied to survey data. The development of electronic computers has led to tremendous advances in survey analysis and improved questionnaire design (Moser & Kalton, 1986) The availability of data analysis software puts analytical approaches into the hands of novice researchers as well as experienced researchers. Computers

use spans the methods continuum and is just as applicable in qualitative as quantitative research. In all fields, focus groups are increasingly often employed for qualitative research. Due to their shared use, market research and social research continue to be connected. Meta-analyses were developed as the number of studies on certain themes grew beyond what could be easily assimilated. Meta-analysis looks for every study that has ever been published on a specific subject, and then thoroughly examines the collection of studies together with a collection of findings. The sophistication and power of the social research method have increased as its infrastructure and support community have grown. Methodological research is now commonplace and we are better able to gauge the extent to which social research findings are real. The use of Artificial Intelligence is now been common in research places. It collects very minute data and generalization that is beyond human calculation and intellect.

Conclusion

It is not an easy question to answer what core factors make research relatively durable, reliable, and valid. The real question is what we are heading to our research methods. Are we covering a humanistic perspective in research methods? From here we can conclude that we miss this somewhere which shows a dialect between what is happening in the hope of what ought to happen. We traced the root from Indian texts and shows that which method led to some of the great research in entire human history. Undoubtedly, they are phenomenal in nature but lack of evidence makes it down in the lens of the west. Further, we analyzed the evolution and history of social science (major sociology) with conditions that made research methods evolve to the contemporary scene. Our limitation is not to go beyond constructed reality and misinterpretations of research methods. Methods, ecology, and objective are interdependent variables that have to be discussed more in our research. For here we left the space for further critics and intellectual contributions to this domain.

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