

Abstraction, Conceptualization, Disambiguation, Ideation, Innovation, Objectivization, Quantification, and Theorization in the Social Sciences: New Pillars for Contemporary Social Sciences Research

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Abstract:- In many of our previous papers published over the years, we had developed and propounded concepts such as fuzzy logic, the theory of paradoxes, the certainty uncertainty principle for the social sciences, innovative methods for the social sciences, and had also explained the importance of inductive approaches, grounded theory, and nomothetic rule building. We had also stated the importance of practicalism as a core component of the philosophy of science. In this paper, we state the importance of abstraction, conceptualization, ideation, innovation, quantification, theorization, objectivization and disambiguation in the social sciences, and explain all of these concepts in detail. We also refer to them as the “pillars of social sciences research methods and techniques”, or “the guiding principles or the guiding forces in the use or employment of social science research methods and techniques, and social science research activity”. These approaches are necessary because social sciences research is mostly qualitative; these techniques could impart quality and objectivity to social science research in a way that other techniques cannot. These are different from the philosophy of science or the philosophy of social science, and these we anticipate would guide and drive much of social science research enterprise in the twenty-first century and beyond. These are also foundationally different from the objectives of social science research, examples of which could be cultural emancipation, inculcation of a scientific temper, etc. Needless to say, these can be gainfully employed in the non social sciences as well, though this is not our primary focus and emphasis here.

I. INTRODUCTION

Clarity and simplicity are the antidotes to complexity and uncertainty – General George Casey

After all, the ultimate goal of all research is not objectivity, but truth – Helene Deutsch

One accurate measurement is worth a thousand expert opinions – Grace M. Hopper

In many of our previous papers published over the years, we had developed and propounded concepts such as fuzzy logic, the theory of paradoxes, the certainty uncertainty principle for the social sciences, innovative methods for the social sciences, and had also explained the importance of inductive approaches, grounded theory, and nomothetic rule building both in various fields of the social sciences, and in other sciences as well. We had also earlier stated the importance of “practicalism” as a core component of the philosophy of science. In this paper, we state and explore at a fair level of detail and depth, the importance of various concepts such as abstraction, conceptualization, ideation, innovation, quantification, theorization, objectivization and disambiguation in the social sciences, and explain all of these concepts in a fairly great level of granular detail. We also refer to them as the “pillars of social sciences research methods and techniques”, or “the guiding principles or the guiding forces in the use or employment of social science research methods and techniques, and for much or most of social science research activity”. We believe that these eight pillars would be fairly all-encompassing, comprehensive and inclusive, and that all other concepts that researchers would encounter in the normal course of their research, would be subservient to these.

These approaches are necessary because social sciences research is mostly highly qualitative in nature; these techniques would, in our belief and view, impart a level and degree of quality and objectivity to social science research in a way that most other techniques cannot. These are different from the philosophy of science or the philosophy of social science, and we anticipate would guide and drive much of social science research enterprise in the twenty-first century and beyond. These are also foundationally different from the objectives of social science research examples of which could be cultural emancipation, inculcation of a scientific temper, etc. Needless to say, these can be gainfully employed in the non social sciences as well, though this is not our primary focus and emphasis here. Other researchers pursuing research in, or specializing in other fields and branches of study in the non social sciences, may extend them in different and novel directions, if they so wish. If these pillars are followed in spirit and letter, true scientific progress (not just superficial progress would

result) along with an intellectual revolution – what we called the tenth intellectual revolution, and scientific progress at the speed of light.

We now review and recapitulate the principles we had espoused in our previous papers. The term “logic”, which is derived from the Greek word “logos”, is widely used in common parlance and refers to a specific way of thinking and is based on the principles of sound and just reasoning. It is also widely used in many fields of study including the hard sciences or the physical sciences and the soft sciences or the social sciences. Logic and reasoning may however, not be applied correctly; they may be applied incorrectly, fallaciously, or even haphazardly. Another interesting concept we had proposed and discussed was that of fuzzy logic, derived from the computer sciences. We had also stated that this concept should find a pride of place in the social sciences as well, and must form a part of social science theory wherever necessary. Fuzzy logic occurs because humans do not always make decisions or evaluate paradigms entirely logically; some amount of subjectivity is always involved, and people are also often swayed by ideologies, personal biases and prejudices, and ignorance or lack of knowledge. These are naturally antithetical and inimical to the pursuit of knowledge, and the pursuit of truth. They also have a huge ripple, and a downstream effect. A much more detailed discussion of the term was accomplished in our paper on the certainty uncertainty principle, where examples were also presented. For greater clarity, refer to our paper “Elucidating the Certainty uncertainty principle for the Social Sciences: Guidelines for hypothesis formulation in the Social Sciences for enhanced objectivity and intellectual multi-polarity”, which was published by us in the year 2023.¹

We had also proposed the “Theory of paradoxes” in another paper published by us in the year 2024. The term paradox is thought to have originated from the two Greek words “para” which means “contrary to” or “beyond”, and “doxa”, which means “opinion” or “thought”. This word was subsequently used in the Latin language as “paradoxum” from where it spread to more modern and contemporary European languages such as English, French and German. The term is used to refer to logically and inherently self-contradictory complex statements, whose components are inconsistent with each other or the larger whole, or statements that run contrary to data, evidence and observation. We had proposed that paradoxes must be consciously and conscientiously sought out and identified, and thereafter satisfactorily resolved through deep-rooted cogitation and thought, and systematic and systemic measures. This will lead us to a higher state of understanding, and enhance knowledge and scientific progress as well. For further conceptual clarity on the issue, readers may read the paper “Paradox identification and paradox resolution in scientific endeavour: Reconciliation of

contradictory rule sets in the interests of better theorization and hypothesis-building”, where the issue is explored at a significant level of detail.²

We had also published a paper on the certainty uncertainty principle in 2023. As per this approach and technique, a conscious and a continuous search for ambiguities and uncertainties in theories or hypotheses in the social sciences, or other sciences must be formally adopted, and a search for uncertainties in hypotheses or statements much become a strong mindset among scientists and researchers. We had also proposed that certainties must be evaluated against uncertainties in every hypothesis or statement, and the net effect taken into account, and that theories could be conserved insufficient or inadequate if any ambiguities or uncertainties are found. We had also subsequently extended this paper to study racism, and propose probabilistic evaluation of theories and hypotheses. Kindly refer the following papers for further clarity: “Recommending probabilistic approaches for hypothesis evaluation: A gainful extension of the certainty uncertainty principle for the social sciences”, and “Quashing racism: Presenting the ‘Comprehensive sociocultural persecution complex’ as a logical extension and a practical application of the Certainty uncertainty principle for the social sciences.”^{3 4}

We had also proposed that innovation must be practiced by sheer force of habit, and a suitable mindset inculcated. We had therefore propose the term “Structured innovative thinking techniques for Social Sciences Research” (or SITTSSR) which was based on intellectualism (or twenty-first century intellectualism), innovative and creative thinking techniques, activism as necessary (for scientific activity), and structured apperception tests for socio-cultural change and theories of sociocultural change as proposed and discussed by us over the years. This would be as essential constituent of socio-cultural change. These are essentially simple and self-explanatory concepts once their core essence is understood and digested for further information and clarity refer to the various papers we have published over the years. These are suitably annotated for quick and easy reference, and for the benefit of readers.^{5 6 7 8 9 10 11 12 13}

² Paradox identification and paradox resolution in scientific endeavour: Reconciliation of contradictory rulesets in the interests of better theorization and hypothesis-building Sujay Rao Mandavilli IJSRT, January 2024

³ Recommending probabilistic approaches for hypothesis evaluation: A gainful extension of the certainty uncertainty principle for the social sciences Sujay Rao Mandavilli IJSRT, June 2024

⁴ Quashing racism: Presenting the ‘Comprehensive sociocultural persecution complex’ as a logical extension and a practical application of the Certainty uncertainty principle for the social sciences Sujay Rao Mandavilli IJSRT, September 2023

⁵ Baking innovative and creative thinking techniques into scientific method: Towards innovative and creative techniques as an intrinsic part of scientific method for higher

¹ Elucidating the Certainty uncertainty principle for the Social Sciences: Guidelines for hypothesis formulation in the Social Sciences for enhanced objectivity and intellectual multi-polarity Sujay Rao Mandavilli IJSRT, March 2023

II. QUALITATIVE RESEARCH AND QUANTITATIVE RESEARCH

Qualitative research and quantitative research techniques are the two most research techniques used in the social sciences, and in several other fields of sciences. These only represent broad categorizations. There are many different research techniques and research methods under each of the two broad categories of research. Quantitative research is largely based on mathematical (or numerical), or statistical concepts, and seeks to provide hard or non-subjective explanations to facts, and seeks to explain phenomena objectively. On the other hand, qualitative research techniques are often or generally non-numeric and subjective as they often measure highly subjective aspects such as contentment, happiness, or grief which cannot mostly be directly quantified. Qualitative research is also more exploratory than explanatory, and uses techniques such as surveys, case studies, questionnaires, and interviews.

scientific and research output Sujay Rao Mandavilli IJSRT January 2024

⁶ Redefining Intellectualism for a post-globalized world: Why present-day intellectualism is obsolete and why a comprehensive reassessment of intellectualism is required Sujay Rao Mandavilli IJSRT, August 2023

⁷ Towards scientific apperception tests for twenty-first century social sciences research: Formulating ‘Structured apperception techniques for socio-cultural change’ in twenty-first century social sciences research Sujay Rao Mandavilli IJSRT June 2023

⁸ Conceptualizing ‘Cultural Frames of Reference’ and ‘Crosscultural Frames of Reference’ for various cultures and societies: Employing these concepts to bring about social and cultural change in different societies Sujay Rao Mandavilli IJSRT, September 2023

⁹ Articulating comprehensive frameworks on socio-cultural change: Perceptions of social and cultural change in contemporary Twenty-first century Anthropology from a ‘Neo-centrist’ perspective Published in ELK Asia Pacific Journal of Social Sciences Volume 3, Number 4 (July 2017 – September 2017) Sujay Rao Mandavilli

¹⁰ The relevance of Culture and Personality Studies, National Character Studies, Cultural Determinism and Cultural Diffusion in Twenty-first Century Anthropology: An assessment of their compatibility with Symbiotic models of Socio-cultural change ELK Asia Pacific Journal of Social Science Volume 4, Issue 2, 2018 Sujay Rao Mandavilli

¹¹ Attempting Diachronic extensions of symbiotic approaches to socio-cultural change: Developing techniques to assess socio-cultural changes over a period in time Sujay Rao Mandavilli IJSRT, September 2023

¹² Widening the scope of social science research to cover global considerations: How “practicalism” can help identify new vistas in social science research Sujay Rao Mandavilli Published in IJSRT, July 2024

¹³ Disseminating the real-world importance of conjunct studies of acculturation, transculturation, and deculturation processes: Why this can be a useful technique to analyze real-world observations Sujay Rao Mandavilli IJSRT, June 2024

Exploratory research refers to research that is conducted in order to investigate a problem that has not been clearly defined, precisely quantified, or has otherwise been poorly understood. Prolonged ethnography, field work, and the participant observation techniques may also be sometimes employed in social science research techniques. Social science research techniques are usually and mostly qualitative; however, some amount of objectivity can, and must be accomplished. Several tools, methods and techniques such as quantification techniques have already been proposed for the purpose and we build upon them so that a greater sense of purpose and direction may be achieved and accomplished in social science research. This could, we believe, have many positive implications for science and society as a whole. We now investigate the “pillars of social sciences research methods and techniques”, also known as “the guiding principles or the guiding forces in the use or employment of social science research methods and techniques, and for much or most of social science research activity” one by one. We believe that these eight pillars would encompass all the facts of social science research, even though there could be some overlap between the concepts residing in the eight individual pillars.^{14 15}

➤ Abstraction

The term abstraction is not widely used in the context of social science research techniques, and probably not as widely as it should be. We may define abstraction as a process by means of which general rules, principles and concepts are extracted, derived and postulated from a detailed and systematic study of cases and examples. Therefore, observations are boiled down to concepts through this process. Ideas are also presented in a distilled form, and unnecessary concepts are omitted in the process. This process is commonly executed by identifying those aspects of a study that can be generalized and theorized. This process is extremely important because it allows for more important aspects to be isolated and examined in greater granularity and detail. The term abstraction may also at times refer to the output or the logical culmination of the process of abstraction. At times, this term can also be used to describe all the processes, methods and techniques involved in the process of abstraction. Abstraction is not only indeed practically possible, but also highly desirable. According to most social science researchers, abstraction is a gift possessed only by human beings, not other animals. This faculty also allowed for the development of languages for example. This idea was also expounded upon in the book *Novum Organum*, authored by Francis Bacon in 1620 towards the end of the Jacobean era. This book deals with logic and reasoning and scientific method in general.

This process and technique is also often explained through the process of reduction – another commonly and gainfully employed technique in science, and this comprises of ontological, theoretical and methodological components.

¹⁴ Robert A. Stebbins, *Exploratory Research in the Social Sciences*. Thousand Oaks, CA: Sage, 2001.

¹⁵ Russell K. Schutt, *Investigating the Social World*, 5th ed, Pine Forge Press.

This concept is also tied and related to inductive research, the induction of ideas, along with a synthesis of concepts, and the process of nomothetic rule building, concepts that we have explored at a fairly great level of depth in our previous papers. We must also interface this with the concept of the “Sociological ninety ten rule”, which we had proposed to call “exceptionism”. Abstraction is the exact opposite of specification which refers to breaking down of a general idea into individual facts. This technique has been used by several scientists in the past, examples of which were Isaac Newton, Nicolaus Copernicus, Johannes Kepler, and Galileo Galilei. The term is also widely used in the computer sciences.^{16 17 18}

➤ *Conceptualization*

Conceptualization is another allied and an associated term, but we must reiterate it nonetheless. Conceptualization refers to the act or process of arriving at a general notion or idea. It leads to the gestation of an idea or a concept which combines all the characteristics and particulars of individual elements. It leads to the generation of a concept, a paradigm, or a framework. A concept is a mental conception. It is an abstract or generic idea generalized from a large number of specific instances, and is an abstract generalization or a generalized notion. It contains classes of objects with similar observable properties. It may begin with an abstract mental visualization, but may be eventually concretized. In many cases, it may be a fundamental building block or a pillar of a larger overarching paradigm, with several intrinsic and embedded generic principles, thought patterns and belief systems, all combined into a holistic whole. Concepts can also be then combined together in multiple ways to form paradigms and frameworks.

A paradigm is a typical example or pattern of some complex concept; it is a pattern or model of something which is complex, has complex underlying properties, but is presented in a fairly granular level of detail, and in a manner that can be easily understood. It provides a standardized perspective regarding a set of ideas. Paradigms are also often extended to form paradigm theories. Such theories provide researchers with basic assumptions, key concepts, and standard unifying methodologies. They impart research activity with a general direction and provide a set of attainable goals. A large set of paradigms may be combined to form a framework; the latter is much more all-encompassing and overarching than a basic paradigm. Conceptualization skills are also extremely important for

¹⁶ Jung, C.G. (1971). *Psychological Types*. Collected Works. Vol. 6 (1921 ed.). Princeton, NJ: Princeton University Press. ISBN 0-691-01813-8

¹⁷ Cantor, Norman F., and Peter L. Klein. *Seventeenth-Century Rationalism: Bacon and Descartes*. Massachusetts: Blaisdell, 1969

¹⁸ Unveiling the Sociological Ninety-ten rules for Social Sciences research: Towards better hypothesis formulation in the Social Sciences in the interests of higher quality research and intellectual multi-polarity Sujay Rao Mandavilli Published in IJISRT, February 2023

any researcher as he works on research projects. This would naturally also include social science researchers who must possess some conceptualizing ability which can add value to fields such as linguistics and psychology. Examples of conceptualization skills include analytical skills, critical thinking skills, problem solving skills and comprehension. Conceptualization is also tied to innovation and creativity, and many of the skills listed in this paper go hand in hand. Even though some of the pillars may have some similarities and commonalities between them, and are interrelated in multiple different ways, each of the pillars is unique in its own special kind of way, and therefore warrants and merits a separate detailed investigation.¹⁹

➤ *Disambiguation*

Disambiguation refers to the removal of ambiguity by making something that is presently or currently unclear, abundantly clear. This word comprises of two parts, namely “dis” and “ambiguity”, which means a lack or absence of conceptual clarity. This idea and concept first arose in a computer science or a natural language processing context, where it means identifying the context and exact connotation of a word, but is sometimes and less often already used in the social sciences as well. We believe the time has come to expand its usage in the social sciences greatly, as it is an extremely useful concept to boost scientific output, and achieve both precision and rigour at the same time. Per this concept, a social science researcher must incessantly and ceaselessly strive towards achieving and accomplishing clarity of concepts. He must do this by proactively striving to identify concepts that are not yet clear, and lay them threadbare – i.e, concepts where clarity has not yet been achieved, and seek out additional data and information that could hone concepts to perfection. This process must employ valid and bonafide social sciences research techniques, mostly qualitative ones, including ethnography and fieldwork. Such process can then be used in adjunct and conjunct processes of theorization and hypothesis-building. This approach and technique is the crying need of the jour and day; this is because absolutely antiquated concepts and paradigms remain, and these mostly reflect whims of old Eurocentric researchers. We may also introduce the term “defuzzification” here to the extent it collates with our earlier concept of fuzzy logic. This could be another novel and interesting term, but is already used in the study of logic, and in the computer sciences.²⁰

➤ *Ideation*

The concept of ideation refers to the highly creative process of creating, refining and communicating new ideas to the general public, where the term “idea” is taken to mean a basic element of thought that may be either

¹⁹ Quine, W. (1999). two dogmas of empiricism. In E. Margolis, & S. Lawrence, concepts: core readings (pp. 153–171). Massachusetts: MIT press.

²⁰ Edmonds, Philip; Kilgarriff, Adam (2002). "Introduction to the special issue on evaluating word sense disambiguation systems". *Journal of Natural Language Engineering*. **8** (4): 279–291

concrete, visual, or abstract depending on the circumstances where it is birthed. It may also be polished or unpolished, and refined or unrefined, often requiring further work and refinement in many cases. The process of ideation encompasses many different stages of a thought cycle, right from conceptualization and gestation, to refinement and development, and then to implementation and actualization. There are many methods and approaches commonly employed in the ideation process. Common ideation techniques are brainstorming (where a group of individuals comes together to generate new ideas and debate them by literally trashing them out, and seeking alternatives), idea mapping where ideas and concepts are systematically refined and related to other existing or new ideas, brain writing where participants write down their ideas and debate them, etc. Other less common techniques have been proposed, and these include scamper, the 5 why's techniques, the Delphi method, and the six thinking hats technique. Ideation is particularly necessary to solve many social problems, and actively seek out solutions to various problems plaguing society such as illiteracy, poverty, disenfranchisement, lack of sanitation, or the absence of a scientific temper. It therefore goes without saying that social progress is not possible without ideation, which is closely relation to innovation.^{21 22}

➤ *Innovation*

The term innovation is much more commonly and practically used in daily life, must more commonly in fact, than the previously explained concept of ideation. The term has particularly become widespread since the dawn of the knowledge economy and the computer and the internet age though Joseph Schumpeter and others defined it soon after the Second World War. The term refers to a practical implementation of ideas, though the adoption of superior or best practices in the industry or field which may include processes, methods, and technologies. The mantra here is ideation, implementation, and dissemination of ideas in that order. Innovation is different from invention, but innovation may extend invention in different ways either by finding new applications, or through creative use. Innovations are said to be disruptive if they present completely new frameworks, and change the status quo fundamentally. Extreme variants are known as fundamental innovations. Henderson and Clark however categorize innovation based on their impact, importance and inter-disciplinarity into radical innovation, incremental innovations, architectural innovations, and modular innovations.

This categorization is not nearly as popular as other ones. Innovation is also indeed possible in the social sciences as we have previously discussed, and would depend on the existence and discovery of social lacunae or bottlenecks. Many definitions have indeed been proposed for innovation, but a commonly used definition was

²¹ Jonson, B (2005) "Design Ideation: the conceptual sketch in the digital age". *Design Studies* Vol 26 No 6 pp 613–624

²² Michalko, Michael (2006) "Thinkertoys: A Handbook of Creative-Thinking Techniques Paperback" ISBN 978-1580087735

proposed by the American sociologist Everett Rogers, who defines innovation as "An idea, practice, or object that is perceived as new by an individual or other unit of adoption". Innovation can indeed help in economic growth and progress, but from our perspective, it can help in cultural amelioration as well. (Utterback 1971) Innovation is also tightly linked with creativity. Creativity is an innate and intrinsic characteristic of an individual who creates a new and valuable object. Creativity enables people to solve problems in new or innovative ways. It helps them to think out of the box, and also to contribute greatly to society. There are many innovative and creative thinking techniques ; one of the is TRIZ. The term TRIZ stands for the "Theory of Inventive Problem Solving," in Russian. This is an internationally accepted system of creativity developed in the former USSR by the noted engineer and scientist Genrich S.Ashtuller.^{23 24}

III. OBJECTIVIZATION

Objectivization refers to the process of objectivizing. This is also related to the principle and concept of concretization where abstract and unfinished concepts (often crude, vague and untested ideas) are concretized, and brought to a solid shape and form. In this connection, it must be emphasized that personal feelings and emotions must not be allowed to come in the way under any circumstances. This process is carried out by delineating, particularizing, and exemplifying a concept. To delineate a concept means to describe or portray a concept clearly, precisely and concisely. Particularization refers to the process of providing complete details regarding a specific concept. Exemplification is relatively less important here, though we may still describe it; it is the process of providing concrete examples to illustrate a concept, or put forth an idea in clear and uncertain terms in such a way that it is communicated unambiguously.²⁵

➤ *Quantification*

In some fields of the sciences, including social sciences, quantification refers to the formal act and process of counting objects, including uncountable ones. By uncountable here, we mean phenomena that are so highly subjective and abstract, that they cannot be easily or readily counted. It is for this very reason, that quantification may be deemed to be central to the scientific method. Quantification is extremely useful because it facilitates further downstream research on variables, by means of frequency analysis and statistical correlation, and has the potential to uplift science in general. However, we believe that this concept must become much more central to the scientific method than it currently or presently is. This technique is often executed by

²³ Steven Johnson (2011). *Where Good Ideas Come From*. Riverhead Books. ISBN 978-1-59448-538-1.

²⁴ Sonenshein, Scott (2017). *Stretch: Unlock the Power of Less and Achieve More Than You Ever Imagined*. Harper Business. ISBN 978-0-06-245722-6

²⁵ Clouse, Barbara, 2006, *Patterns for a Purpose*: McGraw Hill Publishing Company, pg G-2

means of the creation of scales, indices, and factors. For example, we may have a happiness index or a wind chill factor in science. However, in social sciences, a Likert scale is most commonly employed for this purpose. A Likert scale is very commonly used and popular rating scale system that is used to measure attitudes, opinions, and behaviors. As per this method and techniques respondents are asked to respond to a series of questions, and choose the option that best suits their position or stand on the issue. If such techniques are to be adopted, an organization and a systematic arrangement of data must be adopted, and data must also be carefully and methodologically categorized and classified. Sometimes the Thurstone scale developed by Louis Leon Thurstone in 1928 is also used. Other work of scaling such as cumulative scaling or scalogram analysis has also been done by Fisher and Guttman.

In the social sciences, this technique is widely used in economics, linguistics (quantitative linguistics) and psychology, and less often in sociology or the political sciences; however, its use can increase manifold if more people become aware of it. However, this must not be done blindly and can never be adopted universally. There will always remain abstract concepts that can never be quantified, and must never be quantified. If this approach is adopted mindlessly, many nuances and intricacies in the data will be lost. We must therefore always proceed with utmost care and caution in such cases. We must resist the temptation of an overreliance on mathematical and statistical representations in science; as a process, this is already happening in several subfields of economics. We have harped on this ad nauseum and have also highlighted the dangers of this trend and tendency. Extremely soft sciences such as philosophy, a study of morals and ethics also do not lend themselves easily to quantification. Social and cultural data may also change rapidly, and quantification may prove to be misleading under such circumstances. Wherever quantification is done, there must be no underlying bias or prejudice; this will have a ripple, cascading and a multiplier effect, and may distort the results unduly. Models of quantification have also been proposed, and examples include Hayashi's Four Methods of Quantification which is used in multidimensional data analysis. Other terms such as "Empiricisation" have also been proposed by the Indian Marxist and left-leaning economist Prabhat Patnaik in relation to the communist goal of defeating capitalism. Such concepts even when seen against the backdrop of the larger interests of this paper, are largely irrelevant for our purpose; we merely therefore, mention them in passing, and only whenever and wherever absolutely necessary. ²⁶

IV. THEORIZATON

Theorization refers to the process of conceptualization, formulating, and putting forth general concepts by identifying and abstracting common properties drawn from a

large number of instances. This is much more than a conjecture however, as it is based on observable and rock solid data. For example, we may say that people of a country smoke too much because there is scant awareness of the ill-effects of smoking there. The first step in a scientific method is often the formulation of a research problem through which gaps in research and in current understanding are identified. Research questions are also then formally identified, and existing research is also carefully and methodologically analyzed. The next step is to generate a preliminary working hypothesis. This hypothesis is often tentative, and must be eventually refined through retesting, and as additional data becomes available. The improved hypothesis may be tested again wherever necessary, though this is usually left to the discretion of the researcher. Hypotheses morph into full-fledged theories in due course, and some of these may eventually even evolve into laws. The process of theorization may be accompanied by other research tool and techniques such as root cause analysis, cause and effect analysis, etc. ²⁷

V. CONCLUSION

In many of our previous papers published over the years, we had developed and propounded concepts such as fuzzy logic, the theory of paradoxes, the certainty uncertainty principle for the social sciences, innovative methods for the social sciences, and had also explained the importance of inductive approaches, grounded theory, and nomothetic rule building in the social sciences. We had also reviewed and revisited all these concepts briefly in this paper. We had also defined and stated the importance of practicalism as a core component of the philosophy of science, and had also explained why this had to be the logical way forward. In this paper, we had also stated the importance of the defined concepts of abstraction, conceptualization, ideation, innovation, quantification, theorization, objectivization and disambiguation in the social sciences, and had also explained all of these concepts in a fair level of detail. We had also referred to them as the "pillars of social sciences research methods and techniques", or "the guiding principles or the guiding forces in the use or employment of social science research methods and techniques, and social science research activity". These approaches we argued, were necessary because social sciences research is mostly qualitative; these techniques could impart quality and objectivity to social science research in a way that other techniques cannot. We anticipate that these concepts if properly applied, could be a game changer for the social sciences; they can also lead us to the tenth intellectual revolution, and usher in scientific progress at the speed of light, if they are used and applied properly, and in true letter and spirit.

²⁶ Cattell, James McKeen; and Farrand, Livingston (1896) "Physical and mental measurements of the students of Columbia University", *The Psychological Review*, Vol. 3, No. 6 (1896), pp. 618–648; p. 648

²⁷ Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: Opportunities and challenges. *Academy of management journal*, 50(1), 25-32