

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

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Abstract:- The Sociological Ninety ten rules that are proposed in this paper, are based on the fundamental premise that various branches of social sciences like sociology, anthropology and economics are human-centric and are therefore inexact, and vary fundamentally from the more precise and exact sciences like physics, chemistry and mathematics which are characterized by precision and exactitude. A high degree of precision and certainty may not therefore manifest themselves in various branches of the social sciences, even if they at times make use of mathematical models or statistical techniques. Therefore, for every postulated rule in most fields in the social sciences, there are likely to be many different exceptions. These may be described as cultural variations and cultural exceptions, and exceptions over time or space. The name 'Ninety ten' is only an easy-to-understand and easy-to-use nomenclature. Real world exceptions to any given observation could be twenty per cent, five per cent, or take on any other value, but the above nomenclature is chosen for convenience. Variations across or within cultures or within or in between socio-cultural groups, socio-economic groups, occupational groups or any other parameter must be assessed based on the principles that we propose. This may be a basis for splitting up such groups if necessary for further study and evaluation, and the prerogative for this lies with the researcher. Thus, not only rule-based reasoning but also case-based reasoning must be used for various fields in the social sciences. Therefore, a fundamental premise of this paper is that exceptions must be sought actively, as these will lead to better research and hypothesis formulation. Thus, every researcher must think of rules and exceptions to those rules, and this must become a mindset. If exceptions are significant, they may warrant an altogether different line of research. This process will also greatly aid in inductive analysis, nomothetic rule-building and theorization, and play a major role in the 'Globalization of science', particularly social sciences.

I. INTRODUCTION

The Sociological Ninety ten rules that we propose in this paper, have as their primary foundation and basis, the basic and the very fundamental premise that virtually branches of the social sciences like sociology, anthropology, psychology, linguistics political science, archeology, economics, to name a few, and even evolutionary biology (for example, even twins are not identical physically, or emotionally, and there are wide variations, in growth, physical development, and behavioural patterns across societies and cultures) are all highly human-centric and are as a consequence, highly inexact, and in this respect, vary quite fundamentally and substantially from the much more precise and exact sciences like physics, chemistry and mathematics which are characterized by a much greater degree of precision and exactitude, and lend themselves much more easily and readily to quantitative techniques or statistical analysis. A high degree of precision and certainty may not therefore manifest themselves in various branches of the social sciences, which primarily deal with an understanding of social problems, even if they at times may make use of mathematical models or statistical techniques such as ANOVA tests or analysis of variance tests, design of experiments, randomized controlled trials, and the theory of probability either judiciously or otherwise. Concepts such as human nature and human environment are also extremely complex to grapple with and understand, given that there are a large number of variables and variations.

Additionally, for every postulated rule or paradigm in virtually every field in the social sciences, there are likely to be many different exceptions and variations, of many different categories and types, colours and hues, many of which may not often be captured in a mainstream analysis, given that over-simplification is more often the norm in scientific research. These may be described as cultural variations and cultural exceptions (or in some cases, non-cultural variations and exceptions), and exceptions over time or space, which are also known as diachronic and synchronic exceptions respectively.

The name ‘Ninety ten’ is only an easy-to-understand and easy-to-use moniker and nomenclature. Real-world exceptions to any given observation could be twenty per cent, five per cent, or take on any other value, (They can also be fifty percent, and in this case, refer to our section on bi-modulated studies; or if thirty percent, multi-modulated studies) but the above nomenclature is chosen for convenience. If a variation is significant, it deserves to be studied with a greater attention and focus, and apart from the parent observation. Variations across or within cultures or within or in between parameters such as socio-cultural groups, socio-economic groups, occupational groups or any other parameter that makes sense in a given context, must also be suitably assessed based on the principles that we propose in this paper. This may be a basis for splitting up such groups if necessary for further study and evaluation, and the prerogative for this lies with the researcher. Thus, not only rule-based reasoning but also case-based reasoning must be used for various fields in the social sciences.

Therefore, a fundamental premise of this paper is that exceptions must be sought actively, as these will lead to better research and hypothesis formulation. Thus, every researcher must think of rules and exceptions to those rules, and this must become a mindset by itself (and quite deeply ingrained in the psyche and the mindset of the researcher), just as Eliyahu M. Goldratt’s, famed theory of constraints and its many derivatives as espoused in his publications such as “The goal: A process of ongoing improvement”, “It’s not luck” and “critical chain”, led to new paradigms in critical analysis and thought: In this case, the authors had suggested that a constraint-based approach become a fundamental thought process. Thus, from our perspective, every model, phenomena, statement, and assertion, must also be viewed and understood in terms of their possible underlying exceptions. If exceptions are significant, they may warrant an altogether different line of research, and these may spawn different hypotheses that stand apart in their own right. This process will also greatly aid in inductive analysis or bottom up analysis, in contradistinction to the much more commonly used deductive approach, and also nomothetic rule-building and theorization, and play a major role in what we call the ‘Globalization of science’, particularly social sciences. We would like to call this approach “exceptionism”, as opposed to the common term “exceptionalism”. Other approaches such as mathematical model-building, we believe, must be used sparingly, and only to the extent necessary, as a reckless and inappropriate usage of such models will even limit the widespread applicability and outreach of the social sciences. Our approaches, we fervently hope, will lead to a much higher quality of social sciences research in diverse cultural contexts, and help it serve humanity as a whole. It will also help scientists win the trust, hearts and minds of diverse populations in the globe, and lead to what we call the “Cultural trust” and the “Social trust” of science and scientists: This would further boost science and scientific

output in a constant upward spiral. It would also serve the principles of the Sociology of science very well.^{1 2 3 4}

II. OVERVIEW OF RESEARCH

➤ *What is Research?*

All progress is born of inquiry. Doubt is better than overconfidence, for it leads to inquiry, and inquiry leads to invention. (Wilkinson and Bhandarkar, 1979).

The commonly and widely used English word “research” is derived from the Middle French term “rechercher”, which means to research (it’s antecedents can be traced all the way back to the year 1577) and is said to be composed of two syllables, namely “re” and “search”. The term “re” is a common English prefix meaning again, anew or all over again while the term “search” is a English verb meaning to examine very closely, carefully and meticulously, or to probe and investigate thoroughly. (Thyer, 2001) These two, taken together form a word which refers to a careful, systematic, and often detailed study and investigation, or a structured inquiry in a specialized field of knowledge or a branch of scientific endeavour or activity, usually and typically undertaken with a view to establish facts or principles, or to derive or formulate new theories. This approach typically uses formalized scientific methodology including processes, frameworks, methodologies (either qualitative or quantitative), tools, instruments, techniques and philosophies, and is commonly and gainfully employed to solve often complex or intractable real-world problems, understand a phenomena thoroughly, and create new streams of knowledge or extend current knowledge in new and innovative directions. Often, it is also the basis of decision making and policy formulation.

Research almost always involves a critical study of large masses of data or information with a view to arriving at conclusions. Research can also challenge authority wherever required in order to replace outdated or outmoded ideas with new ones, thus adding to, enhancing and furthering knowledge. Good research must have universal applicability, (unless its assumptions or limitations are otherwise explicitly and clearly stated) and must attempt generalizations, but only to the extent possible or necessary, and be verifiable, reliable and valid in the given context. From our perspective, the term “context” also refers to, and encompasses social and cultural contexts, and scientific studies involve a systematic and structured laboratory and field study, which may often be prolonged, protracted, exhaustive, rigorous, intensive, empirical, rational, critical,

¹ Eliyahu M. Goldratt, Jeff Cox. *The Goal: A Process of Ongoing Improvement*. (1984). North River Press; 2nd Rev edition (1992). ISBN 0-88427-061-0; 20th Anniversary edition (2004) 0-88427-178-1

² Eliyahu M. Goldratt. *It's Not Luck*. (1994) ISBN 0-88427-115-3

³ Eliyahu M. Goldratt. *Critical Chain*. (1997) ISBN 0-88427-153-6

⁴ Unleashing the potential of the ‘Sociology of Science’: Capitalizing on the power of science to usher in social, cultural and intellectual revolutions across the world, and lay the foundations of twenty-first century pedagogy Sujay Rao Mandavilli Elk Asia Pacific Journal of Social Science, October – December 2020

credible, orderly, systematic, objective, impartial, and carried out under controlled conditions. It must also not be mechanistic, and must not merely compile facts without any investigative analysis; it almost certainly cannot merely comprise a laundry list of facts, statements, or issues without any new conclusions reached.

Researchers must also follow Occam's razor, and assumptions must be kept to the barest minimum. Hunches and guesswork without any substantive or an empirical basis or foundation must not be encouraged or pursued. Any research activity must also be accompanied by the requisite levels of knowledge and professional expertise in all relevant fields. Whenever research is inter-disciplinary, it must involve collaboration with researchers with the requisite expertise in other identified related fields of research and study as well. Curiosity and open-mindedness are also essential pre-requisites of good research. Research must also be devoid and bereft of different types of conscious or unconscious biases or prejudices, such as confirmation bias, and cultural bias (often arising from knowledge constructed from social or cultural experience) and must involve a singlehanded pursuit and quest of the truth, thus ultimately leading to new enhanced or superior principles, theories, or hypotheses. Thus, the outcomes of scientific activity must also be credible, dependable, repeatable, verifiable, reproducible, transferable to other contexts, and self-correcting.

Research must also follow some method or process, and must not be random or ad-hoc. (Dawson, Catherine) It must also be devoid of any other "isms" such as Eurocentrism, Indocentrism, Afrocentrism or Sinocentrism arising from a need to boost nationalistic, cultural or racial pride, or a desire to establish any other form of sectarian hegemony, or even pursue careerism. It must therefore, help in, and aid in the progress of all or most sections or society. As far as possible, it must be accompanied with in-built testing, ratification, and verification mechanism for the attainment of error-free output. Indeed, the truth and research conclusions must be willingly and ungrudgingly accepted regardless of cultural predilections. Many researchers also believe in the quality or principle of refutability. Research must be subsequently refutable in the interests of scientific progress and tempo, and bad ideas can be subsequently jettisoned, if found outdated, insufficient, or inadequate. These ideas are sometimes referred to as Ethical Neutrality.

According to Clifford Woody, "Research is a careful and critical examination of facts, involving a diligent investigation, study, comparison and observation, and comprises constant definition and redefinition of problems, formulation of hypothesis; it also involves the collection, organization and evaluation of data; and the reaching of conclusions. It must be emphasized that research must necessarily be systematic and logical in order to arrive at certain outcomes."

The researchers D. Slesinger and M. Stephenson in the Encyclopedia of Social Sciences Research define research as "The manipulation of things, concepts or symbols with a view to generalize or extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art." Rajasekar et. al. (2006), define research as "A systematic and logical search for new and useful information on a given topic. It may be defined as an investigation of finding solutions to scientific and social problems through an objective and systematic analysis. It may be defined as a search for knowledge, or a discovery of hidden truths. It also involves derivation or laws and principles. The information may be collected from various sources such as human experience, other individual, books, journals, natural observation, etc." Others have emphasized the role of theory-building in research. According to Boulding, "Theories without facts may be barren, but facts without theories are meaningless."

Other researchers and encyclopedias have also provided definitions of research, but more outstanding definitions have been provided by researchers such as Rocco (Rocco, 2011), V. Redman and A.V.H Mory (Redman and Mory, 2010), C C Crawford, C. R. Kothari, Creswell (Creswell, 2008), H Kara (Kara, 2012), Rusk, George J Mouly, J.H. McGrath, D.E. Watson, Cohen, N. & Arieli, T. (Cohen, N. & Arieli, T , 2011), Ranjit Kumar (Kumar Ranjit, 2005), C. Francies Rummel , Francis G Cornell, John W. Best, James Harvey Robinson, W. S Monroe, and Martyn Shuttleworth. Other scholars and researchers have also provided definitions of research, but most of the salient features of their definitions have been captured and recapitulated above in our synopsis of the characteristics of research.

Some scholars have also attempted to define social science research. For example, Redman & Mori state: "Social research may be defined as a scientific undertaking which by means of logical and systematized techniques aims to discover new facts or verify and test old facts, analyze their sequences, interrelationships and casual explanation which were derived within an appropriate theoretical frame of reference, develop new scientific tools, concepts and generalizations and methods which would facilitate reliable and valid study of human behavior."

Bulmer also states, regarding Social Science research: "Nevertheless, sociological research is primarily committed to establishing systematic, reliable and valid knowledge about the social world." John. W Best even goes as far as to say that social sciences research is the cornerstone of progress in the social and cultural worlds, and helps push back the "veils of ignorance", and "discover new and better ways of doing things". According to Eric Hylla, Stephen M. Corey, Lundberg and others, social science research must be based on experiential or lived knowledge, and may rarely lend itself to predominantly statistical and mathematical processes and methods. MacIver also points out that Social science research has suffered greatly from the attempt to make it conform to methods used in other forms of Research.

Mitchell also emphasizes the importance of qualitative research in the social sciences, and states that even in the work of the most statistically minded, qualitative analysis must have a prominent pride of place, and must be used commonly in all theorizations and generalizations. Symonds strongly asserts that research can never be reduced to a mechanistic process, and this approach can be highly self-defeating. We believe that all these statements and assertions are very true indeed: we must therefore add a cautionary note here, and social science researchers (including economists) must not succumb to the temptation of expressing all social science paradigms in mathematical and statistical terms or equations, however fashionable this may be; we believe that this approach can even be highly limiting and restrictive at most times. Many social science researchers have however used mathematical models extensively: examples being John Forbes Nash in Economics. This would depend largely on their educational and cultural backgrounds. A sea change is therefore warranted in the social sciences, including Economics, and the results and rewards would be there for all to see.

Social sciences research also requires a great deal of creative genius, and a spark of originality to understand problems, in their social and cultural context and milieu, and proceed to solve them accordingly. Good social science requires stepping out of familiar cultural territory, and may even require the development of new perceptions, tools, and techniques. To summarize, we believe these definitions and observations are more or less in line with our beliefs on the attributes and characteristics of research, and social science research in particular, and these should serve as a common yardstick to novices and experienced researchers alike.

While the primary objective of research is the discovery of new facts, research also has other objectives such as the theoretical objective, and application objective. In case of theoretical objective, the primary objectives are the formulation of new theories, principles or laws, which can be used in a field of science, or across diverse fields in science. In case of application objective, the researcher suggests new or novel applications to an existing paradigm or body of knowledge. Often, researchers may also wish to study existing phenomena at a greater level of depth or in a new light. Research may also have other objectives such as the determination of cause and effect relationship between variables, or causal analysis. The often-cited primary objective of research is to improve the quality and standard of living in the society. Research must as far as possible not lead to negative or unfavourable outcomes. For example, controversial topics such as eugenics or euthanasia must be justified adequately, or appropriately before widespread adoption, and must be validated, vetted and ratified from all scientific, social and cultural angles thoroughly and completely. However, it is widely acknowledged that most technological progress has undesirable consequences such as non-sustainable progress, global warming or physical and mental stress, but newer research in various fields of science is addressing such negative consequences. Such negative

effects must be minimized to say the least, even if they cannot be eliminated completely. ^{5 6 7 8}

III. TYPES OF RESEARCH

Research is often categorized into two broad categories: Pure research and applied research. Pure research, which is known as basic research or fundamental research (or theoretical or foundational research), often involves formulating and testing new theories and hypotheses that are intellectually challenging, rewarding, stimulating or fulfilling to the researcher but whose practical application may or may not be known at the present time. The knowledge produced through pure research is often useful because it adds to the existing body of research methods and methodologies. Examples of such research are investigation of a natural phenomenon. Applied research on the other hand, is often carried out in order to solve specific, practical questions that have widespread applicability, or concern society as a whole. Applied research has pure research as its basis, either in original or unmodified form, and applied research is usually descriptive or exploratory. In case of applied research, the objective of such research is initially known, or even forms its basis. Examples of applied research include solution of real-world problems such as low-economic growth, or the poor performance of an automobile. Pure research is often carried out by individuals or institutions, while applied research is typically carried out by research or academic institutions.

Descriptive research seeks to describe a population, event or phenomenon, on a systematic or accurate basis. It can answer questions such as what, where, when and how questions, but usually not why questions. A descriptive research design may use different research methods to investigate one or more variables, without modifying or manipulating them. It also involves collection of data on a systematic basis. In case of co-relational Research, which is a type of non-experimental research method, the researcher measures two variables, and examines the statistical relationship between the two, to identify patterns or understand the cause and effect mechanism. It can therefore, also predict changes in the dependant variable, based on changes in the independent variable, and co-relation can be positive, negative, non-existent or curvilinear. This type of research is also known as causal research. Explanatory research, on the other hand, is the research whose objective is to explain why events occur, and to build, elaborate, extend or to test a theory or a hypothesis. It seeks to identify explanations for issues. Exploratory Research involves a hunt for new things, objects, places, or cultures. It involves

⁵ Research Methodology: Tools and techniques, CR Kothari, New Age Publishers, Second revised edition

⁶ Research design: Qualitative, Quantitative, and mixed method approaches, John W. Cresswell, Fourth edition, Sage publishers

⁷ Research Methodology: A step by step guide for beginners, Ranjit Kumar, Sage publications

⁸ Research Methods, Second edition, William M K Trochim, Cornell University

better understand a problem which is not clearly defined. In case of exploratory research, a researcher starts with a general idea and uses this research as a platform to identify issues that can be used for future research. Exploratory research can also help determine the ideals research design, data-collection methods and strategies and selection of research subjects, and can lead to feasibility study or pilot study.⁹

Research is also widely categorized as quantitative or qualitative. Quantitative research is based on extensive measurements and uses statistical and mathematical processes widely, and includes quantification of abstract phenomena. There is a certain allure, glamour and glitz involved with quantitative research techniques, and this makes them more popular. Qualitative research, on the other hand, is chiefly and primarily concerned with qualitative phenomenon involving abstract, intangible qualities. It is chiefly non-numerical, descriptive, but at the same time, may apply logic and reasoning to strengthen its case, and investigate phenomena such as causality. It is also often highly descriptive, providing detailed descriptions of social phenomena. It is however more subjective than quantitative techniques, and may use sociological concepts such as interpretivism and constructivism as its basis. Qualitative techniques are also somewhat younger in origin than age-old quantitative techniques. Sociologists accept the fact that reality is socially constructed, and not entirely independent of the human mind, and to counter this, intellectual multi-vocality and intellectual multi-polarity must be followed at all costs. Good qualitative research comprising interviews both structured and unstructured, questionnaires, focused group discussion, fieldwork, ethnography and the participant observation technique (including econoethnography), can be highly effective too, if their principles are followed in letter and spirit. Quantitative research is often used in the physical sciences, and qualitative or non-quantitative techniques are more commonly used in social sciences, though this is by no means a hard and fast rule: different researchers pursue different methods, ideas and philosophies. Some social sciences still make extensive use of quantitative techniques because it is fashionable to do so, while other researchers prefer qualitative techniques. We take a strong position in favour of the latter, though the former may still be used wherever required. The latter can be a powerful and potent tool, but only in the hands of the experienced and the initiated. Our chief line of argument is that qualitative research techniques must be pursued in a wide variety of social and cultural contexts before any useful theorizations can be made: we have also referred to this as multi-vocality in ethnographic studies.^{10 11}

⁹ Dawson, Catherine, 2002, *Practical Research Methods*, New Delhi, UBS Publishers'Distributors

¹⁰ Presenting the 'Structured and Annotated Participant-driven Appraisal' technique in *Ethnography: Towards the universal realization of Multivocality in Ethnographic studies* Sujay Rao Mandavilli ELK's International Journal of Social Science Vol 4, Number 4, 2018

We may also classify research into two different categories namely longitudinal research, and cross-sectional research. Longitudinal studies are a type of co-relational research in which researchers observe and collect data on a large number of variables usually over a period in time. In a longitudinal study, researchers repeatedly examine the same individuals a large number of times in order to detect any kinds of changes that might have occurred over the period of time. A cross-sectional study on the other hand, is another type of research design in which data is collected from many different individuals at a single point in time. Common examples of longitudinal research are historical study approach or method, (including DPPF or Dialogue between past, present and future techniques and DHA or deep historical analysis) case study approach or method (with critical, unique and revelatory cases), panel study, and cohort study. More common examples of cross-sectional research, on the other hand, include experimental research and survey research.¹²

Research may also be classified into descriptive research and analytical research. Descriptive research usually includes surveys and different types of fact-finding exercises. The most common objective of descriptive research is a description of the existing state of affairs of a subject or entity at a given point in time. In analytical research, however, the researcher has to use facts or information available, and analyze these facts in order to make a decision or judgment, or arrive at a certain conclusion.

Conceptual research is associated a certain theoretical idea or pre-supposition and is often used by philosophers and deep thinkers to develop new concepts or to refine and develop an existing concept to perfection. Empirical research or experimental research, however, is a data-based approach which brings together data based on experience or observation, relegating theories and concepts to the background. Such research can be subsequently be accepted or rejected, based on observation and experiment.

Research is also sometimes classified into structured research and unstructured research. In case of a structured approach, all aspects of the research process including objectives, design, samples, and research methodology are predetermined, allowing for very little flexibility in subsequent change. The unstructured approach, on the other hand, allows for a great flexibility in various aspects of the research. Changes to the approach can be made as the research progresses. Both approaches have their advantages and disadvantages, but the researcher can decide which approach to adopt in a given context.

¹¹ RESEARCH METHODOLOGY: TOOLS AND TECHNIQUES Dr. Prabhat Pandey Dr. Meenu Mishra Pandey © Bridge Center, 2015

¹² *Historiography by Objectives: A new approach for the study of history within the framework of the proposed Twenty-First Century School of Historiography* Sujay Rao Mandavilli ELK Asia Pacific Journal of Social Sciences Vol 1, Issue 2 (2015)

IV. SCIENTIFIC METHOD

The scientific method is a method for acquiring knowledge that is characterized by empiricism. It has greatly moulded and guided progress in science directly for some four hundred years, and indirectly, for much longer. (Though the Ancient Greeks, particularly Aristotle, and to a lesser extent, Socrates and Plato, contributed greatly to scientific method and reasoning, further development is often attributed to later philosophers such as Rene Descartes, Francis Bacon, Sir Isaac Newton, and others who developed concepts such as rationalism, inductivism and empiricism. Middle East thinkers also contributed to the Scientific method during the Islamic golden age). Scientific method is also related to, and guided by Epistemology, which is the science and the philosophy of knowledge and knowledge-building, and to a much smaller extent to Ontology which is the science of being. It is also related to the philosophy of science which decides what constitutes genuine science, and what does not; it also contains a discourse on the aims and objectives of science. Scientific method involves careful observation, gathering of evidence, data modelling and sampling, exhaustive and extensive literature review including publications in peer-reviewed journals in order to understand the current body of knowledge, the application of rigorous skepticism and the elimination of personal biases and prejudices of various kinds through the openness to consider all kinds of evidence, either for or against, and the usage of techniques such as dialectical approaches or reflective equilibrium.

Scientific method also involves the formulation of hypotheses, via inductive approaches, based on observations and minimal evidence or proof rather than mere hunches or conjectures, (initial hypotheses are also known as working hypotheses) and the further refinement and testing of such hypotheses, through statistical or any other techniques, towards the formulation of theories, principles and laws; it may also involve in certain cases, the discarding of hypotheses which are shown to be false or erroneous. Scientific method consists of a series of steps, which can be somewhat similar to each other, though processes may vary more widely either within or across disciplines.

More modern approaches such as hypothetico-deductivism first became popular some two hundred years ago, and have been widely used ever since. Much work has also been done to distinguish between science and pseudo-science. In more recent years, many philosophers of science such as Thomas Kuhn and Paul Feyerabend have argued against a rigid, pre-defined scientific method in favour of a free-form or a context-specific approach, and more recent academics and philosophers of science such as Karl Popper have also called for empirical falsification as the basis for most scientific activity. This is opposed to Karl Pearson's observations of scientific method being pre-defined and similar to all fields of research. Other philosophers of science such as W V Quine also argue for coherentism, while some others argue for logical positivism or verifiability.

However, most scientific activity is centred around a series of steps such as the definition of a research problem, development of a research question, development of a hypothesis or a set of hypotheses including definition of independent and dependant variables, further observation and refinement of a hypothesis, gathering as much evidence as possible, both for and against the hypothesis, further testing and analysis, and the eventual acceptance or rejection of the hypothesis. These would lead to new perspectives on a particular topic, or even add to the body of scientific knowledge in general. However, elegant this may sound, real-world practitioners of science seldom adhere to these steps in toto, and small or major variations are common, and scientists also rely greatly on intuition, inspiration, innovation and creativity besides other tools and techniques such as Bayesian inference and modelling. In most cases, however, some research methodology, whether researcher defined, or otherwise, is consciously followed.

Good science can also be distinguished from bad science, which in an extreme case can be characterized by pseudo-science or non-science, and the characteristics of good science and good research as propounded in this paper will tell the difference. Many believe that the Greeks laid the foundation for science, and that the Copernican revolution took scientific endeavour and activity one step further. We strongly believe that "exceptionism" and intellectual multipolarity as a philosophy can yield its own rich dividends by taking scientific endeavour to its next logical level, and metamorphosing "immature" and culture-centric social sciences into more mature, polished, pragmatic and sophisticated sciences.

Our approaches would serve to negate and downplay the perils and pitfalls of culture-specific social sciences research, and are based on the principles of constructivism which states that humans actively create knowledge but based on their social experience, interpretivism which states that knowledge is normally socially constructed, post-positivism which states that prior experience and social contexts influence people's perceptions and shape their consciousness, ethnomethodology which examines how individuals construct their views of the world, phenomenology which refers to consciousness experienced from a person's point of view, for e.g. knowledge is situated (Bhavani Kumkum), and additionally seek to counter reductionism, over-simplification and stereotyping as well. These concepts are somewhat similar to Immanuel Kant's philosophy who argued that people could only have knowledge of things they experienced, but knowledge could be enhanced and enriched through reasoning. Chomsky summarizes the role played by perception in generating knowledge very well indeed, when he states "Our ability to identify people, recognize faces, interpret a landscape, and so on is not just a matter of having sense organs, which are in good order, but it also involves active processes of conceptual ordering and interpretation of which we are mostly unaware. All experience is to some extent shaped by our previously acquired map of the world"

These principles are sought to be overcome in our approaches which should inevitably and invariably lead to more culture-neutral and universal social science research paradigms and outcomes; our approaches should also serve to enrich, enhance and complement rationalism, empiricism and experiential knowledge considerably, besides serving the approach of new theories such as grounded theory better. Thus, weak hypotheses can be gradually eliminated, and replaced by strong hypothesis. Simple hypotheses can also be replaced by more complex but workable hypotheses. This approach should also serve to differentiate good science from bad science by providing new definitions and characteristics of good science, and serve to reinforce the observations of researchers such as Emile Durkheim who sought to reinforce the idea that social sciences should be studied with the same precision and rigour as the natural sciences.

More importantly, they should serve to address the common criticisms of most fields of social sciences which are labelled as Eurocentric. Eurocentrism exists because ethnic pride does still exist in many parts of the world (This is a natural process and an outcome, and is common to Asian and African cultures as well, but these cultures have thus far, produced very little scientific output). Also, unfortunately, scientific endeavour has been largely Eurocentric particularly in the social sciences, and scientists from other parts of the world have slavishly followed Eurocentric paradigms. Scientists have also followed a didactic and a pedantic approach, and have talked down to their audiences, from a self-created pedestal. They have attempted to enchain their audiences in their web of ideas, rather than to educate them or liberate them. This approach would be apparent from a cursory reading of most Wikipedia sites as well. This approach was common to many computer courses in the 1970's (it has thankfully receded), must still manifest itself very strongly in other sciences. On the other hand, most oriental researchers, Indian researchers included, have demonstrated very little credibility and scholarly objectivity, and have often based their work on a desire to boost sectarian, ethnic, or nationalistic pride. We have a long way to go before the fruits of the globalization of science are reaped.

This is anathema to the globalization and the popularization of science across cultures and societies, and we must launch an offensive against this tendency. Many science writers and scholars of science such as Stephen Hawking, and Carl Sagan have based their work on limited Eurocentric ideals, too. This would at least hold good in so far as their targeted audiences were concerned. This same observation would hold good for science fiction writers such as Arthur C Clarke who primarily wrote for European and American audiences. This is as much of a cardinal error as Hindutva or Islamic writers whose works are often targeted towards narrow audiences, and lack universal validity or applicability.^{13 14 15}

¹³ The rules of the sociological method, Emile Durkheim, 1895 (originally published in French)

➤ *Characteristics of Sociological Ninety-Ten Rules*

The following are therefore the key and important characteristics of the sociological ninety-ten rules, which is more conveniently also known as, and referred to as the principle of "exceptionism":^{16 17}

- For every observation in the social sciences, there can be an exception or multiple exceptions. Each exception can in turn have further exceptions. Thus, we can define the main rule and exceptions. Exceptions may also be termed as subsidiary rules.
- Exceptions can be statistically significant or insignificant. This decision can be made on a judgmental basis as well.
- If exceptions have not been observed, they may be discovered or arise in future. Thus exceptions may be either known or unknown at any given point in time.
- Thus, there can be exceptions to every rule, and theories must be constantly refined or new and supplementary theories developed for exceptions. The probability that theories in various fields of the social sciences are perfect, and include all data, is very low, or in many cases, virtually zero. This approach can also be extended to other fields in the physical sciences such as evolutionary biology and astronomy, and sciences which are not characterized by a high degree of precision and exactitude, or which exhibit wide variations in observations (or where different types of new phenomena are likely to be discovered).
- The rule and exception paradigm can help formulate better theories and hypotheses, which must be constantly refined and recast as new data arises or is discovered with the passage of time. This approach can also help prevent stereotyping, over-generalizations or over-simplifications, besides cultural misunderstandings or misalignment.

¹⁴ 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

¹⁵ Generic Identity Theory for the Twenty-first Century: Towards grand unified approaches in identity formation, identity transformation and identity dilution or neutralization Sujay Rao Mandavilli Elk Asia Pacific Journal of Social Sciences Volume 5, Issue 3, 2019

¹⁶ 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

¹⁷ Presenting the 'Structured and Annotated Participantdriven Appraisal' technique in Ethnography: Towards the universal realization of Multivocality in Ethnographic studies Sujay Rao Mandavilli ELK's International Journal of Social Science Vol 4, Number 4, 2018

- Exceptions can be time-based or geography-based, or in many cases, a combination of these two.
 - Time-based exceptions are known as diachronic exceptions. These exceptions may relate to the past or the future, and include changes to observations over a period in time. Exceptions may be over the long-term, short-term or seasonal.
 - Geography-based exceptions are known as synchronic exceptions. Extensions of these include cultural variations, variations based on nationality etc. Variations can also manifest themselves within a group.
 - Other planes of variation could include age-based, gender-based or based on other planes such as those based on race, class, caste, nationality, religion, ethnicity, socio-economic groups, socio-cultural groups, occupations groups, or sub-divisions or combinations of these. They could even be based on factors such as sexual orientation. Exceptions can also occur within an individual, usually over time.
 - There can be other types of exceptions too. For example, postulates of a hypothesis may be rendered unworkable or irrelevant if certain conditions are met. Examples of such hypothesis in the social sciences can include exceptions to the law of demand, and the concept of income elasticity in Economics. Such exceptions are common to theories and hypotheses in the physical sciences too. While these must be documented, these are strictly outside the purview of our paper.
 - “Exceptionism” is a mindset and must be practiced conscientiously at all times, by sheer dint and force of habit. Every theory, hypothesis, law (including all laws that have been thus far formulated in the social sciences) must be subject to this test. All statements and assertions in relation to a phenomena must also likewise, be put to this test.
 - The principle of “exceptionism” must be linked to theories of socio-cultural change such as the symbiotic approach to socio-cultural change. Such theories must be studied from a synchronic or a diachronic perspective, or a combination of both.
 - Social science research also usually yields new and unique results, and this holds good of various techniques such as ethnography or case studies, and the latter may be unique, or even critical and revelatory.
 - Studies can be carried out from an emic perspective or an etic perspective, ideally, a combination of both. They can also be carried out in combination with other techniques such as data triangulation, method triangulation, and investigator triangulation.
 - Laws in social sciences also almost always follow statistical laws as opposed to causal laws. In the former case, relationship may not be consistent or invariant, while in the case of the latter, it always is. Thus, in case of a causal law, event B will always follow event A, while in case of a statistical law, event B will most probably follow event A. In most fields of the social sciences, co-relation may not always imply causation, and simple mathematical relationships may be misleading.
 - Specific techniques such as multi-vocality in Ethnography and emic techniques can be used to identify and document exceptions along with standard tools and techniques used in the social sciences or the physical sciences.
 - Exceptions may relate to a culture as a whole or include specific components of culture alone as evidenced by, and captured through a cultural taxonomy.
 - Paradigms, theories or hypotheses that do not take exceptions into consideration, must state their assumptions upfront, or run the risk of being labeled bad science.
 - There are different possible outcomes or decisions. Either the main hypothesis needs to be refined or modified, or an alternate hypothesis needs to be developed. Alternatively, neither of the two needs to be developed, and the phenomenon may or may not be studied.
 - This approach can also be used for explanations and hypothesis used to explain phenomena, and mainstream hypotheses may be extended or supplanted in case of extreme outliers and other diverse contexts.
- *The Principle of “Exceptionism” Involves Asking the Following Questions Conscientiously, and at all Times, as a Matter of Habit:*
- What are the possible exceptions to a rule, hypothesis or paradigm?
 - What exceptions are already known? Have these been already studied and documented, or do these require further study?
 - What are the potential exceptions that are currently unknown, but may become known in the future?
 - How can exceptions be anticipated or predicted?
 - What are the possible synchronic, geography-based or culture-based exceptions?
 - What are the possible diachronic or time-based exceptions?
 - Which exceptions are significant and have a bearing on the hypothesis?
 - Which exceptions are significant enough to be studied separately?
 - Which exceptions are insignificant? Should these be ignored completely, or studied nonetheless? Can any threshold be defined for this?
 - Can the exceptions have further exceptions?
 - How can the hypothesis be refined and improved after considering these exceptions?
 - What types of research need to be carried out to study exceptions? Can the main research methodology be used, or should a different research methodology be adopted?
 - Should the hypothesis be refined, or a new hypothesis be developed for the exceptions? Is the new hypothesis strong enough, or should further evidence be considered?

➤ *Possible Criteria (whether a Hypothesis Needs to be Split-Up Into Two or More Parts)*

The following criteria will be used to decide whether a hypothesis needs to be broken up into two or more parts.

- Whether the sub-hypothesis is integral to the main hypothesis.
- Whether they are usually analysed together.
- Whether the sub-hypothesis represents a small number of exceptions or a large number of exceptions.
- Whether the sub-hypothesis reveals a critical unique or revelatory case.
- Whether a great deal of analysis is required for the sub-hypothesis.
- Whether the sub-hypothesis requires to be presented to another target audience.
- The principle of keeping the main hypothesis simple can also be used: There is no need to add clutter.
- Tipping point – the point after which hypothesis refinement becomes uneconomical for the social sciences is used as a deciding factor. i.e. the time spend is not commensurate with the incremental benefit. (Time or Effort barrier)
- Tipping point – point after which hypothesis refinement becomes uneconomical for the social sciences is used as a deciding factor. i.e., the cost is not commensurate with the incremental benefit. (Cost or economy barrier)
- There is always a reducing incremental benefit of refining hypotheses as more data is collected.
- There is always an increasing difficulty of refining hypothesis as more data is collected
- After a certain point, observations must be categorized as exceptions

➤ *Hypotheses will be Deemed Inadequate, Flawed or Bad in the Following Situations:*

- Inadequate sample size is used.
- The sampling technique used is inadequate.
- Hypothesis does not hold good for a large number of cases.
- Hypothesis is not holistic and does not make sense from most angles.
- Sample size does not represent most values of the variables (cultural values) E.g. nation, language, ethnicity, religion, age, gender.
- Hypothesis may be culture-specific, and this assumption may not be stated upfront.
- Other assumptions of the hypothesis may not be stated upfront.
- Hypothesis based on such data may be deemed limited hypothesis, or in some cases, bad hypothesis.

➤ *Benefits of this Approach*

- Can be used to guide in the development of hypothesis.
- Leads to better and more inclusive hypotheses.
- Can be used in the presentation of hypothesis and communication of hypothesis.

- Can help refine hypothesis further and further as more and more data is collected.
- Can be used to guide research effort and direction.
- Can be used to prepare a cost-benefit approach of research efforts.
- Can be used to actively search for and document exceptions. Examples are studies of geniuses, mavericks and mad men in psychiatry.
- Can be used in the analysis of exceptions.
- Can be used to develop sub-theories for exceptions.
- Exceptions can in turn have further exceptions, which may be studied if required.
- If exceptions are significant, they may warrant an altogether different line of research.
- Thus, new lines of research can be created.
- New target audiences can be created.
- Can be used in decision making.
- Exceptions which can be left out from the main hypothesis, are left out from the main hypothesis.
- This process will also greatly aid in nomothetic rule-building and theorization.
- Can be used to test hypothesis effectively. E.g. “People with low IQ have a high EQ”.
- Can boost scientific knowledge by developing new hypotheses.
- Can aid in ideographic studies.
- Ethnography- driven theory formulation will result.
- This approach leads to more concise modelling, including data modelling, and data which is not critical to the model is left out. Thus, better poly-thematic or functional models can result.
- This approach may be used to develop thresholds of reliability and standards for reliability of data.
- This can have many practical applications such as the design of social security measures, or universal basic income solutions, for example, in specific contexts.
- Data outliers are usually built into the hypothesis.
- Leads to faster progress in science.

V. PLOTTING OBSERVATIONS IN A CONTINUOUS PROBABILITY DISTRIBUTION

Observations can also be plotted in a continuous probability distribution, and exceptions and outliers identified. Probability distribution is an important theory in probability theory and statistics. In case of a continuous probability distribution, the random variable can take on infinite values within an interval or a continuum. The most common type of continuous probability distribution is the normal distribution. This must be distinguished from a discrete probability distribution where the variable can take on only discrete values, and occurrences have finite or countable outcomes, common examples of this being tossing of dice or coins. In either case, the probability of all the occurrences taken together adds to one.

The most common types of discrete probability distribution are the binomial distribution, and the Poisson distribution. A binomial distribution is a discrete probability distribution with parameters n and p where n is the number of independent trials or experiments, p is the probability of success, and q is the probability of failure. This is akin to a Boolean or a yes-no or a true-false question. In such a case, q represents the probability of failure and is denoted by $1-p$. In this case, $p + q = 1$. Thus, if a coin is tossed, the probability of getting a head is 0.5, and the probability of getting a tail is also 0.5. Alternatively, if a dice is rolled 30 times, the probability of rolling a one on any throw is $1/6$. This results in a binomial distribution of ($n=30, p=1/6$). A multinomial distribution is a generalization of the binomial distribution, and in this case, there are more than two outcomes. For examples, if we roll a die thirty times to see what number we roll, there are 6 possibilities namely 1, 2, 3, 4, 5, and 6, so this is a multinomial experiment. Multinomial distributions are also sometimes used in various fields of the social sciences.¹⁸

A Poisson distribution is a probability distribution that calculates how many times an event is likely to occur over a specified period or timeframe. A Poisson distribution is also used to estimate the likelihood of something happening "X" number of times. This is sometimes extended to calculate the probability of an event happening between two points in space, or within a bounded area as well. Examples of Poisson distribution include the calculation of the probability that more than 500 people will buy a hamburger in an hour in a store.

A normal distribution which is also known as the Gaussian distribution, is a probability distribution that is symmetric about the mean, and data around the mean is more frequent in occurrence than data away from the mean. A normal distribution resembles a bell-shaped curve. Many naturally-occurring phenomena tend to approximate the normal distribution, examples being lengths, diameters or weights of papayas or watermelons. A perfect normal distribution is symmetric about the mean. Its mean is zero, and standard deviation (measure of dispersion and square root of variation) is one. It has zero skewness (the attribute of not being symmetrical) and kurtosis (measure of tailedness or thickness of tail) of three. It is asymptotic about the x-axis. The concept of Normal distribution has widespread applicability in the social sciences – for example, the IQ (Intelligence quotient) or EQ (Emotional quotient) of individuals in a country follows a Gaussian distribution or a Normal distribution, as also does income distribution of individuals in an economy. In the social sciences, wages and income levels also follow a normal distribution. While many real-world phenomena closely follow a normal distribution, some early researchers believed that almost all scientific data followed a normal distribution, and such a belief was proved to be wrong. Such

a distribution is also referred to as a unimodal distribution. Whenever the kurtosis is high, i.e. tails are thick on either or both sides, from our perspective, a more focused analysis of outliers may be warranted or called for.

A bimodal distribution is a distribution with two distinct clusters of data (with two distinct peaks), while a multimodal distribution is a distribution with multiple clusters of data, with three or more peaks, as also shown through a histogram. In some cases, such distributions have two or more modes. For example, the distribution of heights in a sample of adults may have two peaks, one for men and the other for women, and this is a very simple example of a bimodal distribution. A multimodal distribution has multiple peaks, and a bimodal distribution is also technically a multimodal distribution. While exam grades usually follow a normal distribution, in some cases, bimodal or multimodal distributions may be exhibited, with many students getting A, C and F grades for example, and only a few getting other grades. In case of bimodal and multimodal distributions, variations must be studied carefully and cautiously, and if necessary, different explanations and hypothesis developed for different masses of data. Thus, use of statistical techniques can help, but this should by no means be the only approach adopted. We can refer to studies associated with bi-modal distribution as bi-nucleated studies and studies associated with multi-modal distributions as a multi-nucleated studies. Bimodal and multimodal distributions may or may not have exceptions. Exceptions may or may not be significant, and may be of one or more types.

VI. USAGE WITH OTHER STATISTICAL TECHNIQUES

This concept can also be used along with a study of mean, median, mode, standard deviation, or other measures of dispersion. It can also be used along with a qualitative analysis, bucketing, and quantification techniques. They can also be used along with Boolean variables, and with or without parametric data. For example, quantum of income can be used for decision making. (People above a certain income should be excluded from a benefit, or from an analysis so that a more meaningful analysis can be performed). Number of sources of income (People with more than "n" sources of income can be excluded from a benefit or from an analysis). Inheritance patterns (People not following a particular inheritance pattern (or inheriting money over a certain limit) can be excluded from a benefit or an analysis). Saving pattern (People with saving percentage or amount above or below a threshold level) can be excluded from or included in a benefit or an analysis) Investment patterns (People not following a particular investment pattern can be excluded from an analysis or a benefit). Spending patterns (People not following a particular spending pattern can be excluded from a benefit or an analysis). Family support system (Parental support system, Sibling support system, Children support system, or a Joint family (People forming a part of a particular family support system can be excluded from a benefit or an analysis), Social support system (Governmental or Non-governmental (People not subscribing to a particular social

¹⁸ Introductory Business Statistics: By Alexander Holmes, Barbara Illowsky, Susan Dean · 2018

support system can be excluded from another benefit), Entrepreneurship (Turnover of business or Type of entrepreneurship) can be used in an analysis. These principles can also be combined with the principles of sampling, and the theory of probability, and we look forward to work from other scholars in the days to come. These can also be combined with the Sociological Ninety-ten rules, as different values, based on pre-defined and pre-determined rulesets can be included or excluded from an analysis, or analyzed separately.

➤ *Examples and Patterns of Usage of the Sociological Ninety-Ten Rule*

We now list out examples and patterns of usage of the Sociological Ninety-ten rule in various branches of the social sciences, in order to understand their varied applicability.

VII. HYPOTHESES IN ECONOMICS

We will now list out some basic theories in Economics to discuss how our concepts can have a bearing on such approaches, theories or hypotheses. Economics is one of the oldest fields of study known to mankind, given that even early humans have been preoccupied with economic problems, and research in Economics is traced back to the Greek polymath Hesiod: Ancient India (Kautilya's Arthashastra) and China too produced treatises in Economics. However, there was a rapid expansion in output of Economic thought during the European Enlightenment with the pioneering works of Adam Smith and others. Economics is also one of the most important fields of study in the social sciences, and is the queen of the social sciences. It largely deals with the production, distribution and consumption of goods and services, and also studies the process of wealth creation in relation to resources. It studies what to produce, and in what quantities, how to produce, for whom to produce, and with what resources to produce. Most economists consider economics to be a science while others beg to differ, labeling it an art instead. According to Robbins, "Economics is the science which studies human behavior as a relationship between ends and scarce means which have alternative uses." The science of Economics is primarily subdivided into microeconomics (study of individuals) and macroeconomics (study of the economy as a whole), though there are other branches of economics such as behavioural economics, developmental economics, welfare economics, labour economics, econometrics, managerial economics, environmental economics, and anthropological economics. Theories such as Marxism which are based on the theories of Karl Marx, have also greatly influenced Economics. Schools of economics have included Classical Economics, whose its adherents have included Adam Smith, David Ricardo, and Jean-Baptiste Say (This school espouses a free market economy and a self-regulating hand), Neo-classical economics whose adherents have included Leon Walrus, William Jevons, John Hicks, George Stigler and Alfred Marshall (this school focuses on demand, supply and consumption), Keynesian economics (This school argues for greater government regulation) and

monetarist economics which argues that income is a function of money supply.

Economics is also a thriving and flourishing field of study, and research in Economics and business has increased greatly in modern times. More innovative techniques are being applied as a part of heterodox economics, and mathematical and statistical approaches are also being used. Economists such as Marshall, Pigou, Hawtrey, Frazer, and others considered economics to be a social science which economics involved value judgments which could be always be empirically verified. Thus, there may be no real laws in economics. According to Professor Seligman, economic laws are essentially hypothetical, and draw conclusions from mere hypothesis. Therefore, so-called economic laws are often based on a large number of assumptions, which include psychological assumptions, behavioural assumptions, normative assumptions, and structural assumptions. Laws in economics, and indeed other social sciences are not really laws even though they may be falsely and unrealistically be labeled as such. There is a plethora (no dearth) of such laws in any given field of social science, yet there is no sincere effort to rigorously test them or reconcile them. In lighter vein, this also applies to less serious observations loosely referred to as laws, examples being the Peter principle or Murphy's law, Markov's principle or Pareto's rule, or even Thomas Kuhn's theory of paradigm shifts! The statement "all geniuses have Asberger's syndrome" (E.g. Alan Turing), or "All geniuses have schizophrenia" (E.g. John Forbes Nash) (Or a statement which says "All psychiatrists believe that geniuses have schizophrenia or Asberger's syndrome) can also have exceptions, but this is outside our purview. The oft-cited Moore's law, which is not really a law, is also entirely outside our purview, though concepts that we have proposed in our earlier papers such as cultural or societal orientations, can have bonafide exceptions.^{19 20 21}

The important field of microeconomics is a sub-field of economics which studies the economic behavior and decision-making processes of individuals and economic decision makers. This is opposed to the study of an economy as a whole which is covered in macroeconomics, but macroeconomics is largely dependent on microeconomic theory. Microeconomics also comprises a study of what might happen when individuals make choices or decisions in response to changes in prices, incentives, resources, or methods of production. It also studies the equilibrium of individual consumers and producers, and the equilibrium of markets. This sometimes comprises a psychological or a behavioural study. Individual actors are usually grouped into microeconomic subgroups, examples being sellers, buyers,

¹⁹ Advanced economic theory: Macroeconomic analysis HL Ahuja, S Chand and company 2019

²⁰ Economic theory, Gary S Becker, Aldine transaction, 2008

²¹ Introducing Anthropological Economics: The quest for an Anthropological basis for Economic theory, growth models and policy development for wealth and human welfare maximization Sujay Rao Mandavilli ELK Asia Pacific Journal of Social Sciences Volume 6, Issue 3 (April –June 2020)

and business owners. Micro-economics first arose in a laissez-faire and a full employment scenario. This itself is an assumption, and may not be applicable in all contexts and scenarios. According to Ackley, "Microeconomics deals with the division of total output among industries, products and firms, and the allocation of resources among competing groups. It considers problems of income distribution. Its interest is in the relative prices of particular goods and services."²²

Important theories and concepts in microeconomics such as welfare economics are also largely context and society-dependant because welfare is mostly subjective, and not an observable and a measurable quantity in cardinal terms. Researchers must therefore resist the temptations of making omnibus assumptions, and must instead adopt grounds up approaches in various social and cultural contexts. This may also be because value judgments, or conceptions of what people believe to be good or bad vary from context to context. This has been greatly emphasized by economists such as Paul Samuelson, IMD Little, and KE Roulding. Therefore, wherever qualitative techniques are used to understand welfare, they should always be context-dependant. The concept of welfare economics was first developed by AC Pigou, but was subsequently extended by other economists. In his view, welfare could be summarized as a state of mind, and welfare could be achieved through self-satisfaction of wants or utilities. Therefore, economic welfare, according to Pigou, is a part of societal or general welfare that can be brought directly or indirectly into relation, with the measuring rod of money.

There are many important and foundational theories and concepts in macro-economics, one of them being that of a production possibility curve. This curve explains the economizing and optimizing process in a hypothetical economy, and seeks to explain in what quantities two goods namely X and Y can be produced. This hypothesis, though well-meaning, and used as a foundation for more complex theories, has so many assumptions (such as the number of goods produced, usage of raw materials, uniformity of production techniques etc) that it is somewhat unrealistic to expect a parallel in the real-world. From our basis, it is limited because it does not take into account real-world ethnographic and empirical data. The idea of indifference curves is also somewhat limited, because it is hard to measure satisfaction realistically. Similarly, the circular flow in a two-sector economy or a three-sector economy, explains the relationship between households, firms and the government. Though easy to understand and abstract, real-world data may often be more complex than this, and this should consequently be put into a limited perspective. The ideas of isoquants and isoclines, may also have somewhat limited real-world utility. Other theories such as the Law of demand, Cardinal utility analysis, the theory of income elasticity and the law of Diminishing marginal utility have however proven to be much more useful (assumptions and exceptions already identified), though there has been a

limited interest in researchers around the world to map cultural variations: this is a bonafide example of the sociological ninety-ten rule.

Nonetheless, there are often wide variations in theories and approaches between different economists, and while different insights and perspectives on vital issues are always welcome, there is no attempt made to reconcile such hypotheses even over protracted periods in time, or to empirically test or verify them. Hypotheses continue to remain hypotheses forever. For example, even in case of a fundamental issue such as economic statics and dynamics, there is a lot of conceptual confusion between economists such as Hicks, Tinbergen, Samuelson, Harrod and Baumol, and there are often islands of opinion untested by evidence. These do not strictly fit into our observations on the Sociological Ninety-ten rule, but we note that economists of other cultural backgrounds have scarcely provided their perspectives. The sociological ninety-ten rules must be adopted for most macro-economic studies dealing with growth, inflation, trickle-down and unemployment. We have introduced concepts such as the socio-cultural group, socio-economic group, and occupational groups, (as well as culture and non-culture goods) and have discussed other theories and concepts in our paper on Anthropological Economics, but these are yet to be widely adopted, and the Identification of Socio-cultural and Socio-economic differentiators for economic modeling is almost never done. How we also additionally wish, as an aside, that theories such as the certainty-uncertainty principle could be modified and extended to the social sciences as well, as these could sift the grain from the chaff, and eliminate the bad theories from the good ones.

Welfare economics may be defined as a formal and scientific study of how the allocation of resources and goods affects social welfare. It also uses microeconomic techniques to evaluate the well-being or welfare of subjects at a macro-economic level. This field can be traced to the work of Arthur Cecil Pigou in the 1920's. The field of welfare economics is based on two fundamental theorems. According to the first theorem, under certain assumptions, competitive markets produce Pareto-efficient outcomes. Pareto efficiency, also known as Pareto optimality, refers to a state where resources cannot be reallocated to make one individual better off without making at least one individual worse off. It is also based on the logic of Adam Smith's invisible hand which argues that producers self-interest and freedom of production and consumption is in the best interests of the economy. According to the second theorem, under further restrictions, a Pareto efficient outcome can also be supported through a competitive market equilibrium. Theories in Welfare economics have included theories such as Kaldor-Hicks Compensation Criterion, Scitovsky Double Criterion, Social Welfare Function of Bergson and Samuelsson and Hicks optimal outcome. Amartya Sen has also given his views on Social Welfare.

²² Frank, Robert H.; *Microeconomics and Behavior*. McGraw-Hill/Irwin, 6th Edition: 2006

A Kaldor–Hicks improvement, named after Nicholas Kaldor and John Hicks, refers to an economic re-allocation of resources among people that is related to Pareto improvement, but has less stringent criteria and therefore has more widespread applicability. A situation is said to be Kaldor–Hicks efficient, if no potential Kaldor–Hicks improvement from that situation exists. Scitovsky Double Criterion states that a change is an improvement if the gainers in the changed situation are can persuade the losers to accept the change and also losers also cannot persuade the gainers to remain in the original situation. A Bergson–Samuelson social welfare function considers welfare for a set of individual preferences or welfare rankings. Other views on social welfare have been provided by John Hicks and Amartya Sen. Many of these theories are somewhat abstract, and are not based on fieldwork or data collected from various social or cultural contexts, which should form the foundational basis for hypothesis-building, hence our critique.²³

Behavioural economics is an important field of Economics which aims to study the effects of psychological, emotional, cognitive, behavioural factors, and the makeup of individuals on economic decision-making processes. This field developed based on the work done by Economists such as Daniel Kahneman and Amos Tversky in the 1960's (These Economists also developed important theories such as the prospect theory). This field of study argues that humans are not always rational thinking machines, and that the human brain is not rigidly hard-wired.

The Prospect theory sought to replace the Expected Utility theory which was developed by John Von Neumann and Oskar Morgenstern in the 1940's. This theory suggested that Economic actors treated gains and losses as equal. Richard Thaler, in 1980 proposed the highly-influential subject of 'Mental accounting' which stated that people tended to think more in subjective and relative terms than in absolute terms. Economists have also worked on concepts such as informational cascades, herd mentality, and group preference-building, and have sought to integrate it with diverse fields of study such as psychology and behavioural science. However impressive this may sound, (Behavioural economists also unquestionably boosts the power of Economic theory greatly), much of theorizing and theory-building in this field is not based on raw and empirical data, and many theories have often, largely been based on limited, western perspectives.²⁴

International trade theories refer to the different theories used to explain different facets of international trade, where trade refers to the exchange of goods and services between two or more people, entities, or countries,

²³ Identity Economics, how our identities shape our work, wages, and well-being, GEORGE A. AKERLOF AND RACHEL E. KRANTON, Princeton University Press

²⁴ BEHAVIORAL ECONOMICS IN THE CLASSROOM, Principles of Behavioral Economics, By David Laibson and John A. List, American Economic Review: Papers & Proceedings 2015, 105(5): pp 385–390

usually carried out for mutual benefit. A lot of theory has been developed around international trade, and we present some below. From our perspective, these at best refer to strategies and approaches, and their merits and demerits are yet to be quantified through studies in different contexts, and their impact on pre-specified parameters such as poverty, and the trickle down of wealth, hence the divergence of views among Economists. These theories have at best remained theories, and are likely to remain so, for the foreseeable future. Thus, the principle of exceptionism must be applied here, as to fields of study as far removed such as Managerial economics, where theory and practice would be dependent on cultural factors. The concept of exceptionism must also be applied to other concepts and ideas such as Management theory and practice, and even to contest results from various studies such as the Hawthorne experiments.²⁵

The theory of mercantilism was developed in the sixteenth century, and is amongst the oldest theories in Economics. This theory states that a country's wealth is determined by the quantum of its gold and silver holdings. Mercantilists also believe that a country should increase its holdings of gold and silver by promoting exports and discouraging imports through protectionist measures, since imports are paid for through gold and silver. Such theories were once espoused by colonizers such as Britain. Derivatives of this theory known loosely as neo-mercantilist theories are still followed in many parts of the world such as India and Japan. Way back in the year 1776, the pioneer Adam Smith questioned the mercantile theory which was prevalent at the time, and proposed a new trade theory called the "Theory of absolute advantage", which focused on the ability of a country to produce a good more efficiently and cheaply than another rival nation. This theory focused on absolute productivity rather than relative efficiency. Adam Smith also argued that trade between countries should not be regulated or restricted through government policy. David Ricardo, an English economist, introduced the "Theory of comparative advantage" in 1817, and in this theory relative productivity, and not absolute productivity was emphasized.

Much later, in the early 1900s, two Swedish economists, Eli Heckscher and Bertil Ohlin, focused their attention on how a country could gain comparative advantage by producing products that utilized factors of production such as land, labour, and capital (which in turn determined funds for investments in plant and machinery), that were found in abundance in the country. Swedish economist Steffan Linder first developed the "Country similarity theory" in the year 1961, as he sought to explain the concept of an "in train industry trade". Linder proposed that consumers in countries that were in a similar stage of development would have similar preferences. Trade would therefore be carried out with countries with similar preferences which implied similar parameters such as per capita incomes. Raymond Vernon developed the product life cycle theory in the 1960s. The theory stated that a product life cycle had three distinct stages, namely a new product, a

²⁵ An Introduction to Behavioral Economics, 2nd EDITION, Nick Wilkinson & Matthias Klaes 2012

maturing product, and a standardized product. The theory assumed that production of the new product would occur completely in the home country of its innovation, but this assumption was proven to be time specific, and context specific, and did not stand the test of time, as globalization has upturned many of its assumptions.

The “Global strategic rivalry theory” was developed in the 1980s and was developed by economists Paul Krugman and Kelvin Lancaster. Their theory focused on firms and their efforts to gain a competitive advantage against other global firms in their industry. Firms typically encounter global competition in their industries and to prosper, they need to develop various competitive advantages, through barriers of entry such as research and development or economies of scale. Michael Porter developed a new model to explain national competitive advantage in the year 1990. Porter stated that a nation’s competitiveness in an industry depended on the capacity of the industry to innovate. His theory also tried to explain why some nations were more competitive in certain industries, and this could be explained through factors such as local market resources and capabilities, local market demand conditions, local suppliers, local complementary industries, and local firm characteristics.^{26 27}

➤ *Hypotheses in Sociology and Cultural Anthropology*

The fields of social and cultural anthropology have spawned many theories. Among the oldest school of thought in Cultural Anthropology is the uni-linear approach to evolution. Such models of evolution or concurrent and related models of evolution were variously proposed by Anthropologists and Sociologists through the ages such as Edward Burnett Tylor, Lewis Henry Morgan, Michel de Montaigne, Montesquieu, J J Bachofen and McLennan, and also by Enlightenment thinkers such as Adam Smith, Adam Ferguson and John Miller. These theories also substantially influenced later philosophers such as Karl Marx, and others. The theory of Neo-evolution was proposed by Julian Steward and Leslie A White. According to Leslie A White, the energy harnessed by individuals could be used to assess human evolution. Marshall Sahlins and Elman Service spoke of General Evolution and Specific Evolution, and this approach allowed for culture-specific patterns of evolution. Other theories such as cyclical theories (Oswald Spengler and Arnold J. Toynbee) and pendular theories (P A Sorokin) were also proposed, but they were only theories and had very little evidence to back them up. Conflict theories of change were proposed by AW Green, and others, while the theory of power elites proposed by C. Wright Mills. Other proposed concepts such as “Social Darwinism” and “Social Organism”, and proponents of these theories often compared societies to biological entities.

Another school which tried to identify the interrelationship between personality and culture is known as the ‘Culture and Personality’ school which developed a wide spectrum of theories (wide variations and with sometime no overlap), and stated that culture was developed in relation to the environment. This school evolved as a reaction to Unilinear theories of evolution and diffusionist theories. Proponents of this school have included Ruth Benedict, Margaret Mead, Ralph Linton, Abram Kardiner and Cora du Bois, and this school of thought was based on the theories of Sigmund Freud. A related concept is that of a “National character” (Margaret Mead and others), but this is also somewhat obsolete now, in the age of globalization. Theories of diffusion have been grouped into the American school, German school, and British school, with further sub-divisions.

Then, there have also been the schools of functionalism (with a wide gamut of sub-theories by Meyer Fortes, Rodney Needham and S F Nadel among others) and historical particularism. Other theories such as the “Oedipus complex” (Sigmund Freud) were more bizzare, but were based on very little evidence. Thus, over-theorization, and careerism (with a little desire for reconciliation of views or a grounds-up analysis of issues in diverse social or cultural contexts, or over a period in time) have been the bane in Anthropology and Sociology as well, (even through some research has been based on sound ethnographic principles) with negative consequences that researchers, and the layman in European societies cannot understand. They have, through a form of “fuzzy logic”, undermined the credibility of mainstream science all along, and have even reinforced belief in non-scientific or pre-scientific concepts and ideas, particularly in Non-European cultures. If science has to have a more widespread acceptability, and transform society, it must be more credible in the eyes of different types of people across cultures and societies. Many of Marx’s ideas such as the conditions of labour, and the distinction between the bourgeoisie and the proletariat were also characteristic of conditions prevailing in mid Nineteenth Europe (along with downstream theories such as the theory of alienation) and many of his ideas and observations including those on historiography, were based on generalizations, despite half-hearted attempts to put his ideas to work elsewhere such as the Asiatic modes of production. On another plane, theories such as the symbiotic approach to socio-cultural change, and theories on groupthink can also have exceptions, and these must be actively sought out. Even the processes of acceptance or rejection of scientific ideas can have exceptions on the basis of culture, or otherwise, and these must be sought out. Refutation of the idea of God, in western contexts usually refer to the refutation of the idea of a Christian God as described in the Bible, but there are other definitions of God in other cultures, even though they may not have been scientifically arrived at. This confuses people from a non-Christian background.

²⁶ Foundations of Economics: Fourth Edition, Andrew Gillespe, Oxford, 2016

²⁷ Economics, Paul Samuelson, William D Nordhaus, Nineteenth Edition, Tata McGraw Hill, New Delhi, 2010

➤ *Hypotheses in linguistics*

There are many different hypotheses in linguistics, but most are flights of fancy, and are barely tenable, from a twenty-first century standpoint. These are fundamentally flawed, just as the idea of a covering law in history is flawed. We list a few of them below:²⁸

The Bow-wow theory, the Sound Mimicry theory or the principle of onomatopoeia refers to the idea that speech arose from people imitating the sounds that living and non-living objects make in the real-world: this is obviously somewhat absurd and has rather limited applicability. The Pooh-pooh theory (aka the expressive theory, the interjectionist theory or the expressions of emotions theory) is a theory which states that speech comes from involuntary verbal responses to emotions such as pain, fear, surprise, excitement, or pleasure, and has limited applicability too. The ding-dong theory states that speech reflects a harmony connected with real-world objects, and that objects were named after their real-world properties.

Other theories have included the yo-he-yo theory, the ta-ta theory, the chew-chew theory, the la-la theory, the lah-di-dah theory, the ma-ma theory, the hey-you theory, the uh-oh theory, the yakkety-yak theory, the looky-look theory, the putting the baby down theory, the singing theory, the watch the birdie hypothesis, and the babbling theory among others. We have briefly reviewed these theories in a previous paper; these are not only unrealistic and mutually exclusive, but also show how cut-off much of scientific endeavour has been from reality. Better theories have included theories based on Behaviourism, Noam Chomsky's theory of Universal grammar, the conversation theory, the meme theory among others, but these too are not based on data collected from diverse sources and contexts. Theories such as the Monogenesis theory and the theory of Universal grammar also do not hold up to in-depth scrutiny, despite the interest they may have generated, and can easily be refuted and falsified, much in the same manner as unscientific theories such as the Divine origin theory can be refuted and falsified. This is one reason why mainstream social sciences may be held in low esteem in non-European cultures, though this must be ratified through valid social science research methods.

We have proposed a theory known as the 'Epochal polygenesis approach', and these was based on some raw data; we had also proposed that this needed to be refined further based on data collected over space and time. This is of course, a bonafide approach to hypothesis-building, and is an intrinsic part of scientific method. Examples of other theories are 'The Sapir-Whorf Hypothesis' which is a theory of linguistic determinism: this theory argues that language moulds man's perception of reality, but is mostly neither provable nor unprovable, Theories such as Zip's law, are

²⁸ On the origin and spread of languages: Propositioning Twenty-first century axioms on the evolution and spread of languages with concomitant views on language dynamics Sujay Rao Mandavilli ELK Asia Pacific Journal of Social Science Volume 3, Number 1 (2016)

only statistical laws, and such concepts may have limited downstream utility. Other approaches such as those proposed in our paper on the Indo-Europeanization of the world from a Central Asian homeland can prove useful, but exceptions must be sought out, and documented, just as they must be sought out and documented for the principles of language dynamics, or language replacement, for example.
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➤ *Hypothesis in Psychology*

Psychology is the study of mind and of human behaviour. It also studies functions of the human mind, and factors affecting behaviour in a given context. Different schools in psychology have included structuralism (study of structure of mind and elements of thought), functionalism (adaptation of mind to environments), Gestalt psychology, behaviourism, psychoanalytic theory, humanistic psychology, existential psychology, psychobiology, cognitive psychology, evolutionary psychology, and cultural psychology. Some of these perspectives have been reactionary, and have not always been based on raw or hard data.

The major perspectives in psychology have included cognitive, behavioral, psychodynamic, socio-cultural, biological, humanistic, and evolutionary. Most researchers in psychology have indeed based their theories on some scientific method, and techniques in psychology have been based on naturalistic observation, case studies, survey research, the correlation method, and the experimental method, and even though much data has been collected to prove theories such as the theory of operant conditioning which is based on reinforcement, for example, it has been from a limited, western perspective. Some attempt has also been made to understand cultural variation, acclimatization, and adaptation; the processes of acculturation, enculturation and identity-formation have also been studied, though not necessarily in diverse contexts.

Some Anthropologists such as Margaret Mead have also studied adolescence in specific contexts such as Samoa and the USA, albeit from a limited perspective, and puberty and child-rearing have been studied too. Other Anthropologists have studied national character, for example, Ruth Benedict (Japan), Geoffrey Gorer (Russia). Culture and personality studies have been developed by Anthropologists such as Edward Sapir and Ruth Benedict.

²⁹ Towards a comprehensive compendium of factors impacting language dynamics in post-globalized scenarios: Presenting principles, paradigms and frameworks for use in the emerging science of language dynamics Sujay Rao Mandavilli ELK Asia Pacific Journal of Social Sciences Volume 6, Issue 3 (April –June 2020)

³⁰ Addendum to "The Indo-Europeanization of the world from a Central Asian homeland: New approaches, paradigms and insights from our research publications on Ancient India" which was published in Journal of Social Science Studies, Macrothink Institute, Volume 3, Number 1 in 2015 Sujay Rao Mandavilli

Others such as psychologist Arbram Kardiner and cultural anthropologist Cora du Bois have developed concepts such as modal personality, but most research has been from an etic perspective, and some of it has been targeted towards Western audiences. Fields such as educational psychology, too, have developed from western perspectives, (though the differences in outcomes based on “race” in American contexts have often been studied. We have discussed this in detail in an earlier paper on Anthropological pedagogy, and there has been limited output on study of educational outcomes in relation to traditional cultural mores, and belief systems, or in relation to identity formation.

We had discussed how the ‘Sociology of science’ could be used to create intellectual revolutions the world over in a previous paper, but this remains mostly a pipedream. Studies on topics such as Islam and Hinduism have often been based on western perspectives, and critics of Islam such as Wafa Sultan have also adopted stereotyped western perspectives on Islam and have catered to non-Islamic audiences. Emic perspectives on Hinduism and Islam have been promoted by non-western scholars, but these have often lacked rigour and credibility. These studies were also not based on an understanding of a wider cultural background, or scientific principles, and were not taken seriously. What would be the outcome, we could ask, if a large number of scholars from diverse cultural backgrounds, imbued with a scientific mindset, took up cross-cultural studies?^{31 32 3334 35 36 37}

➤ *Hypotheses in the Physical Sciences*

The Out of Africa theory or hypothesis (also known as the OOT or OAT) or sometimes as the “Recent out of Africa theory or hypothesis” is a model that proposes the origin and dispersal of homo sapiens or modern humans out of Africa in more recent times. According to this hypothesis, humans evolved in the north eastern part of Africa from other local archaic hominins, spreading to the rest of the world from around. 70,000 years ago, and replacing, archaic hominins found outside Africa by admixing with them.

³¹ General psychology, consultant editor Naima Khaton, 2012 Dorlin Kindersley (India) Pvt limited

³² General psychology, S K Mangal, Sterling, 1998

³³ Ruth Benedict, The chrysanthemum and the sword

³⁴ Coming of age in Samoa, Margaret Mead, 1928

³⁵ Keep your powder dry: An Anthropologist looks at America, Margaret Mead, 1942

³⁶ Why ‘Anthropological Pedagogy’ may matter: Positioning ‘Anthropological Pedagogy’ as a game changing paradigm in Twenty-first century Anthropology and Twenty-first century Pedagogy Sujay Rao Mandavilli Published in Indian Education Research Journal (IERJ), July 2018

³⁷ Generic Identity Theory for the Twenty-first Century: Towards grand unified approaches in identity formation, identity transformation and identity dilution or neutralization Sujay Rao Mandavilli Elk Asia Pacific Journal of Social Sciences Volume 5, Issue 3, 2019

This hypothesis is sometimes known as recent single-origin hypothesis or RSOH, replacement hypothesis, or recent African origin model or RAO. Reasons for such spread are rarely given, and if provided, are seldom convincing. The causes for anatomical differences between humans around the world are also usually not explained. Routes for migration into Europe, Asia and eventually into the new world have also been proposed, but are seldom convincing. Others claim that migrations took place in waves starting 270000 years ago, and not receding until around 70000 YBP. There are also different variants of the Out of Africa theory, and no one version has gained widespread acceptance till date. This theory is just a hypothesis, and has not been reconciled with data from Europe and Asia. The multiregional hypothesis, proposed by Milford Wolpoff and others, is another model which seeks to provide an alternative explanation to the "Out of Africa" model. According to this hypothesis, hominins arose in different parts of the world simultaneously or at different periods in time, and subsequent human interbreeding took place to give birth to a single human species. There are many variants of this theory, and this model must be differentiated from pure polygeny which is akin to parallel evolution and states that humans evolved independently in different parts of the world with almost no gene flow among populations.

Casual, less rigorously researched theories also give a bad name to science as such and may even, though “fuzzy logic” undermine the sanctity of much more credible theories such as Charles Darwin’s theory of evolution. Scientists have to contend from reactions from different parts of the world, who as such remain skeptical of much of scientific activity. Some variations could be expected among Anthropologists on issues such as the anatomical classifications of humans, but hypothesis such as the OAT must be constituted as weak, or bad and do not take into consideration evidence already collected from many disciplines. Such theories must also be differentiated from theories such as ‘The theory of punctuated equilibrium’, which is an example of a good hypothesis, though untested.

➤ *Hypotheses in Other Sciences*

This approach can be used in the other sciences too. For example, a study of road accidents may be based on data gathered only from European or American contexts. Driving habits and road conditions in Asia, Africa and South America may be altogether different. Data collected from such surveys are often used to design automobiles, and to build safer automobiles, but as data is often collected from limited sources, automobiles safety is jeopardized. Car safety tests developed with European or American conditions in mind are often used in other countries regardless of thought, thus compromising passenger safety. Sometimes, fuel efficiency ratings are based on tests carried out within a particular geography, thus misleading people from other regions of the world.

VIII. CONCLUSION

This short and brief paper extrapolates, elucidates and elaborates on an important principle we had developed in the paper on Anthropological Economics a few years ago, and where we had just mentioned it in passing. This approach we believe is a crying need of the day, as we proceed to challenge old Eurocentric paradigms pertaining to the pre-globalized world, and ensure that the just rewards and the attendant benefits of science are reaped and felt across the world across cultures. We hope that scientists across the world along with those in European cultures will embrace these methods, approaches and techniques unequivocally, and unhesitatingly in the interests of science and scientific endeavour as a whole, for it is our firm belief that such approaches, will serve the cause of science and humanity as a whole much better.