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Quantifying, Measuring, and Correlating Socio-Cultural Variables: An Indispensable Technique for Diverse Fields of the Social Sciences

Sujay Rao Mandavilli

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Abstract: The core objective of this paper is to demonstrate by means of suitably crafted examples, how we believe qualitative research should be performed for various fields and sub-disciplines of the social sciences. We also describe the concept of quasi-statistical research design here, a concept that we believed needed to be made much more popular in a previous publication of ours. This paper is also then aligned with our previous concepts of motion variables and a synchronic- diachronic analysis. We begin this paper suitably by defining what variables are, and reviewing different types of variables, and research design. We also explain what social and cultural variables are, and how they have a bearing on this paper. We also then propose and present the various steps of our postulated approach, such as causation, probabilistic causation, and cause and effect analysis, so that a great degree of transparency is accomplished. The examples provided in this paper are both variegated and refreshing, and provide meat, substance, and overall direction to our paper. We believe that this will be a very useful and important paper, because it provides a template that may help social science researchers to break free from a non social sciences mold.

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I. INTRODUCTION

The core objective of this paper is to demonstrate by means of suitably crafted examples, how we believe qualitative research should be performed for various fields and sub-disciplines of the social sciences. We also describe the concept of quasi-statistical research design here, a concept that we believed needed to be made much more popular in a previous publication of ours. Our interpretation of the term quasi-statistical is also slightly different from mainstream interpretations of the term, though we believe our approach is superior. This paper is also then aligned with our previous concepts of motion variables and a synchronic- diachronic analysis. We begin this paper suitably by defining what variables are, and reviewing different types of variables, and research design. We also explain what social and cultural variables are, and how they have a bearing on this paper. We also then propose and present the various steps of our postulated approach, such as causation, probabilistic causation, and cause and effect analysis, so that a great degree of transparency is accomplished. The examples provided in this paper are both variegated and refreshing, and provide meat, substance, and overall direction to our paper. We believe that this will be a very useful and important paper, because it provides a template that may help social science researchers to break free from a non social sciences mold, and carry out much better and higher quality research.

- *What are Variables?*

The term "variable" is quite central to most fields and branches of mathematics and statistics. A variable is a symbol or a notation that represents a quantity that may change or vary within the context of a problem or a study. This is opposed to a constant whose value is fixed, and does not change within the context of the problem. Variables may be a whole number, a fraction, a decimal, a category, a bounded range, a ration, or any other measurable characteristic. Variables are used for the primary purpose of representing unknown values in equations and formulas, or to represent data that is being measured or analyzed in the context of a problem. Examples of variables may include length, breadth, height, weight, volume, mass, temperature, or derived computations of all these. They may also represent not so easily quantifiable parameters such as levels of anxiety and depression. They may also represent categorical values such as colour or occupation. In some cases, the order may matter such as birth order, and such variables are said to be ordinal. Variables may also be qualitative and quantitative, and in such cases, quantification techniques may be employed.

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Variables may also be classified into independent variables and dependant variables. The independent variable is said to be the antecedent variable while the dependent variable is said to be the consequent variable. This is because the latter is dependent upon, or affected by the former. Variables between the independent variables and the dependant variables are said to be Intervening variables. To illustrate, the temperature to which a body is heated may be the independent variable, and the reaction based on certain parameters are the dependant variables. Defining all three is crucial to the understanding and formulation of the problem, and the success of the endeavour. Active variables are those variables which a researcher manipulates or changes, and attribute variables refers to the attribute of an object. Random variables are those variables whose value may change either freely or within a range. Measurement variables refer to those variables whose value is being measured. We also have concepts such as nominal scale, ordinal scale, interval scale, and ratio scale, and these names are self-explanatory. We also have discrete variable and continuous variable based on the precision of their values, and we also have extraneous variables which are extraneous to the problem, and not intrinsic to it. [1] [2] [3] [4] [5]

➢ *Three Types of Variables from our Perspective*

We are primarily engaged in qualitative research or mixed method research, which are the predominant methods in the social sciences. Quantitative and statistical techniques, even when and where used, would be for the most part, be subsidiary to qualitative inputs and techniques. There may indeed be some exceptions here, but we adopt a ninety ten stance here. Therefore, the following types of variables are important from our perspective.

- Qualitative variables with no scope for quantification: Qualitative variables, which are also known as categorical variables, represent attributes, characteristics, qualities, or categories that cannot be measured numerically. Some of these cannot be quantified, though they may be represented as categories. For example, fashion trends in a country cannot be quantified. However, societies may be ranked on the basis of their fashion consciousness. We may have high fashion countries and low fashion countries. Therefore, we must not fall ever for rigid interpretations. Different types of analysis are indeed possible based on the facts and the circumstances of the case. Dogma, and fixed thinking are anathema to meaningful, and high quality qualitative social sciences research, and must be jettisoned or thrown out of the window.
- Qualitative variables with scope for quantification: As explained above, qualitative variables, which are also known as categorical variables, represent attributes, characteristics, qualities, or categories that cannot be measured numerically. However, in many cases, they can indeed be quantified, and represented either ordinally or nominally, i.e., cardinally. For example, we may assign grades in a drawing competition. Otherwise, we may rank students in a drawing completion on an ordinal basis. More complex analyses may even indeed be performed, and we may present quantitatively-derived scores in the form of a normal distribution, or compute mean scores, median scores, modal scores, and standard deviations. We may use interval scales and ratio scales too. For quantification, standard techniques such as Likert's scale, Thurstone's scale, paired comparison scale, continuous rating scales, itemized verbal scales, itemized numeric scales, and semantic differential scales may be used. There are some more, and we have discussed them in brief in our previous publications.
- Quantitative variables: Purely quantitative variables would largely be uncommon in the social sciences, though they could still be employed on a case to case basis. Quantitative variables refer to those variables that are primarily measured numerically or statistically, representing quantities or amounts. The magnitude or degree expressed in such variables is often used further in downstream mathematical or statistical analysis for meaningful analysis and data interpretation. Examples of such variables may include weight, height, age, mass, density, volume, temperature, or a sum total of values.

➢ *Types of Research Design*

We are primarily engaged in qualitative research or mixed method research which are the predominant methods in the social sciences. Therefore, the following types of research design are important from our perspective. We must reiterate here that a research design is an overall plan or method that defines the scope or direction of a research study. It is an extremely useful, if not outright indispensible component of a research process, or a research methodology, and is usually defined upfront, at the start of the research process.

[1] *Stover, Christopher; Weisstein, Eric W. "Variable". In Weisstein, Eric W. (ed.). Wolfram MathWorld. Wolfram Research.*

[2] *Tabak, John (2014). Algebra: Sets, Symbols, and the Language of Thought. Infobase Publishing*

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

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

[5] Advocating output criteria based scientific and research methodologies: Why the reliability of scientific and research methods must be measured based on output criteria and attributes Sujay Rao Mandavilli IJISRT, August 2023

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- Qualitative research design: Qualitative research design primarily makes use of qualitative research methods such as surveys, questionnaires, focus group discussions, ethnography, participant observation method, and interviews as a vehicular medium of investigative research. Qualitative research design is also often and increasingly being used for qualitative analysis, and understanding the deeper and hidden meaning behind phenomena and the "why" and "how" behind observations, rather than just quantifying them for the purposes of a superficial analysis. It also focuses on in-depth exploration of experiences, perspectives, and meanings through phenomenology, analysis of lived experiences and thick and rich analysis.
- Quantitative research design: Purely quantitative research design is rather uncommon from our perspective, though it could still be employed on a case to case basis. This kind of a research design uses a single, or a wide variety of mathematical and statistical research techniques as the sole basis of analysis. Such an approach may include identifying sources of statistical or numerical data, analyzing them mathematically or statistically, collating them, testing hypothesis, and drawing inferences. Correlational and experimental research designs are also usually factored into the mix.
- Mixed methods research design: Mixed method research design involves as mix of both qualitative and quantitative design. There are no standard guidelines for mixed method research design, though a judicious and a harmonious mix and blend of both qualitative and quantitative techniques may be used. What is judicious and harmonious would naturally depend on the circumstances of the case. The objective of mixed methods research design is to bring out the best of both worlds, and leverage the strengths of both qualitative and quantitative research techniques. It can however be costly and cumbersome in many cases, and must be used judiciously and with utmost caution and vigilance.
- Quasi-statistical research design: We throw our weight behind what we have called quasi-statistical research design. As a matter of fact, we proposed that the term which already exists, needed to be made much more popular in a previous publication of ours. We had laid bare the broad contours of our proposed approach, while at the same time, leaving adequate and ample scope for interpretation and reinterpretation. Logic and reasoning need to be extensively used in a quasi-statistical approach, along with other qualitative and quantitative data culled from many sources. However, we believe that quantitative data must be used only to the extent it is necessary in social sciences research, and checks and balances included to ensure that it does not lead to erroneous results and conclusions; such data must be vetted and validated thoroughly, and due diligence performed adequately by the researcher.

➢ *Social Variables*

Social variables are attributes or characteristics that describe individuals or groups of individuals within the context of a society with a bearing on other social and cultural variables. In addition, they are also quantifiable, or directly measurable, and have some practical value in a research study. Social variables are foundational to sociological research, given the fact that they allow researchers to study and investigate the complex relationships between various aspects of social life. Some common examples of social variables may include demographic variables of various types such as age, gender, ethnicity, marital status, sociocultural group, socioeconomic status, educational attainment, and income bracket, purely social variables such as class, sociocultural background and antecedents, participation in social networks, dependence on social and governmental support, religious affiliation, political affiliation, linguistic background, etc. likewise, social variables may also be used to perform behavioral analysis by exploring and investigating, attitudes, customs, norms, beliefs, traditions, cultural preferences etc, and may be used to explore social phenomena and how they reflect on individual patterns of behavior.

➢ *Cultural Variables*

Cultural variables refer to a complex set of factors that are at the intersection between cultures and individuals, and influence peoples' perceptions, attitudes, behavioral patterns, norms, mores, and cultural values. These variables may be wide-ranging and complex, and may include aspects such as communication styles, non-verbal language, assertiveness and general temperament, importance given to religion and tradition, outgoing nature, etc. Understanding these variables can play a major role in influencing the direction and outcome of research. For this however, the researcher must be aware how to use cultural data properly, and define cultural variables appropriately. He must also know what data to use, and what data to ignore for the purpose of any given analysis, given that this is not a purely mathematical approach.

➢ *Sociocultural Variables*

Sociocultural variables may be taken to mean a combination of both social and cultural variables, or the common denominator or the common component i.e. intersection between the two. It all depends on the context of the research, and no hard and fast rules can be defined or put in place. Some researchers may even wish to define and use the term sociocultural variables as an omnibus term comprising both social and cultural variables.

➢ *Economic Variables*

Economic variables are attributes and general characteristics that describe the state and functioning of different kinds of economies. Such variables are usually measurable and quantifiable for the purpose of an analysis. Such variables are often categorized into either macroeconomic and microeconomic variables depending on the context, with each providing different types of insights into various aspects

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of economic activity or functioning of the economy. Macroeconomic variables, such as GDP, GDP growth rates, interest rates, government borrowing, inflation rates, along with other forms of trend analysis and ratio analysis, analyze the overall status and performance of the economy, while microeconomic variables, such as commodity prices and labour wage rates, focus on micro units. These concepts are slightly off the mark from our perspective, even though economics is a valid and a bona fide social science, and would satisfy all the essential observations of our approach. Sociocultural variables are however, well within our radar, ambit and purview. They must be focused upon by other researchers and gone though with a fine tooth comb in order to collate them with the narratives proposed here.

➢ *The Essentials of our Approach*

The following are the essentials of our approach, and they would make for bare and elementary common sense if absorbed and grasped thoroughly, and viewed from a proper perspective. They are presented in a sequential, easy to grasp, step by step format.

- For the social sciences, we recommend quasi-statistical approaches: In case of a quasi-statistical approach, an approach that we strongly and earnestly recommend, statistical data is employed and indeed used, though only to the extent necessary. Such data is ratified against other perspectives, and corroborated by multiple lines of evidence, including logic and reasoning, and creative thinking. Qualitative research methods provide the anchor of research, though statistical methods are also thrown judiciously into the mix. Common sense tests must be passed, and the veracity and truth claims of data will be cleared only if it passes all the above litmus tests. We must at the very outset, define what is meant by statistical data here. Statistical data refers to numerical data that is systematically gathered and analyzed from primary sources, in order to identify patterns and trends, and perform further downstream analysis. Likewise, mathematical techniques of which there can indeed be many, are only a small part of the entire process, and are used only to the extent possible, practicable, and necessary. The researcher must always exercise due caution and due diligence while obtaining and handling mathematical and statistical data. Other qualitative data is pursued and as much qualitative data as is possible must be systematically gathered. Another anchor of our approach is the realization that each research problem is unique and is different. Therefore, the entire research methodology must be driven by the facts of the case, and the problem at hand.
- Identification of concepts, and understanding subject matter knowledge thoroughly: Identification of concepts, and understanding subject matter knowledge thoroughly is yet another important concept from the point of view of our perspective, and the researcher must leave no stone unturned to understand all the concepts and the subject matter thoroughly. A concept is an abstract idea that is the foundation for more concrete ideas and thoughts.
- Defining variables is the next step of the process. A variable as opposed to a constant is something whose value can change throughout the context of the problem. We may also discuss what a parameter is, at this juncture. A parameter is a variable that is used to pass data into a more complex function or expression. Independent variables – can be just about anything- causes for how people think, act, behave, or how data is passed on to such variables. We then also have dependant variables which are dependent on the value of the independent variable. Independent variables are causation variables while dependant variables are effect variables. Tracing and tracking variables is also extremely important as they must be tracked and traced throughout the research process. The difference between causation variables and correlation variables may also be understood because correlation does not imply causation, and the two are different from each other.
- Quantification techniques: Quantification techniques are used to quantify abstract, qualitative data. They are also often used to find out the magnitude, density or order of something. We may use the Likert's scale, Thurstone's scale, Q-sort technique, semantic differential scale etc, for this purpose. We had discussed all these previously multiple times in our earlier papers.
- Identifying factors: The term factor in research refers to elements that can influence or determine the research outcome. There may be many factors contributing to an effect, and all these must be identified judiciously and assiduously. Readers may refer to our paper on hypothesis building here, and the identification of factors is crucial, central and critical to the entire process of hypothesis building. We may also state here that factors are causation variables, causation variables are factors. Enumeration techniques may also be used to systematically list out all elements. A 360 degree and systematic approach is required to ensure that not factors are consciously or inadvertently left out.
- Identifying correlational patterns: Identifying correlational patterns is the next step of the entire research process and research analysis. Correlation implies a statistical relationship between two variables in which case a change in one variable leads to a change in the other variable. It connotes the strength and direction of the relationship between two variables, though it does not automatically imply causation. Correlation analysis is often achieved by drawing scatter diagrams, and we can have perfectly positive correlation, no correlation, or negative correlation, to various values in between. The correlation index is represented in a range of values between one and minus one. We also use Pearson's correlation coefficient, Spearman's rank correlation. We must also use research questions and research problems to determine variables, and asking why, how, what, where, when questions all the time. One trick

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and techniques is to keep asking why (or in some cases, how) until it is no longer possible or feasible to do so.

- We may also non-mathematically and non-statistically identify causation. Causation is the process or act of influencing something. The term is also linked to causality, where an event, state or process, contributes to another event, state or process. Causation may be classified into direct causation and indirect causation, and the names are rather self-explanatory. In case of probabilistic causation, the occurrence of one event increases the probability or change of another event occurring, though it does not automatically guarantee it. Causality is also often classified into absolute causality, conditional causality, and contributory causality, and the names are self-explanatory.
- We may also define relationships between variables as many to many relationship between cause and effect variables, one to many relationship between cause and effect variables, many to one effect between cause and effect variables, and a one to one relationship between cause and effect variables. The relationship between the variables must be carefully monitored throughout the research process. Overlapping variables: Overlapping variables typically occurs when the same data point or observation is included in multiple categories or groups. In other words, two factors are combined, leading to an erroneous conclusion. In some cases, a factor is needlessly split up into splinter categories. This error can be handled through aggregation or disaggregation of factors.
- Data gathering, data analysis and data interpretation: Data gathering, data analysis and data interpretation must also be performed systematically. The primary sources of data could be through surveys, questionnaires, structured, semi-structured and unstructured interviews, ethnography and participant observation methods. Data analysis also includes data sorting and data categorization. While gathering, analyzing and interpreting data, biases and prejudices such as confirmation bias should be eliminated. Statistical and non-statistical errors must also be avoided.
- Research methodology: A standardized scientific method or research methodology must also be followed. This would include several distinct steps such as hypothesis generation, hypothesis evaluation, hypothesis testing, etc. Of late, some researchers such as Karl Popper have proposed a free-form approach that we cannot concur with fully. However, we do recommend output-criteria based approaches. We have also written extensively on scientific method, and our papers are online or publicly available. Readers are well-advised to go through these papers including our papers on hypothesis formulation. Techniques, such as ethnography are not yet widely or firmly established in many fields of the social sciences, and we believe it is now time to rectify and set right this anomaly. From our perspective, cross-cultural inputs also need to be obtained throughout the research process.
- Randomized controlled trials: Randomized controlled trials may also be used, given that they form a standard and an intrinsic part of any research methodology. Experimental research design must be distinguished from quasi-experimental research design. In the case of the former, subjects are randomly assigned between the control group and the experimental group or the intervention group. Placebos may also additionally be used. We may also have single blind study and double blind study. In the former case, only the subjects are not aware which group they are being assigned to, while in case of the latter, both subjects and researchers are unaware. We may also have before and after research study or after intervention research study. In the case of the latter, typically only the control group is used. Double control group study is often used where other extraneous variables such as measurement errors need to be isolated. We also have other concepts such as parallel, crossover, factorial, and cluster randomized controlled trials, all of which are beyond the scope of this paper.
- Identifying lead indicators and lag indicators: Lead indicators refer to factors that anticipate or predict future events or trends. These indicators enable adjustments or course-corrections to be made proactively. Lag indicators which refer to trailing indicators reflect on past events and past performances. Both lead and lag indicators must be constantly and proactively throughout the research process, ad course-corrections initiated systematically and proactively.
- Logic and reasoning: Logic and reasoning are two tightly and closely interrelated aspects of the thinking process. Logic is used to evaluate the veracity and efficacy of the though process, while reasoning supports it by drawing inferences and conclusions. We may bear in mind the concept of fuzzy logic too, which we had proposed and discussed in a previous paper. The latter would make great sense, and would be critical in the context of social sciences research.
- Creative thinking: Creative thinking refers to the ability of an individual to generate new, original, creative and innovative ideas by examining issues from different and diverse (often, entirely new) perspectives and breaking away from traditional and conventional (i.e. regimented) molds of thinking. Creative thinking often involves problem-solving, innovation, and decision-making across all a diverse cross-section of disciplines. Often, lateral thinking and out of the box thinking techniques are also often used to generate unconventional ideas and perspectives. Brainstorming, focus group discussions, six thinking hats techniques, and creative interplay may also be used.
- Corroboration with multiple lines of evidence: Corroboration refers to additional evidence or data with provides added evidence or conformation for a closely-observed data set, a theory or a hypothesis. Corroborative evidence must be sought out always from multiple disciplines and fields, and from independent sources. This would provide added confirmation, and is an essential hallmark of interdisciplinary, multidisciplinary, and

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transdisciplinary studies. Data and evidence must also be evaluated comprehensively, thoroughly and meticulously, and outliers or deviant data adequately justified.

- Drill down analysis may be performed to drill down complex data into more granular units and units that can be much more easily analyzed and dissection. Slice and dice analysis may also be performed, and in the case of the latter data is analyzed repeatedly on the basis of different dimensions, in order to identify new perspectives and bring out hidden meaning.
- Identifying causes: Cause identification may be performed and we may perform a root cause analysis, cause and effect analysis, and a causal analysis here; fishbone diagrams and Ishikawa diagrams may also be used here. We may also establish a cause and effect chain, and in some cases, a circular cause and effect chain. We had explained many of these widely-known concepts in several of our previously published papers, while some others are explained in different sections of this paper.
- Pattern identification and generalization: Pattern analysis refers to a process of structurally and systematically identifying, observing, examining, and interpreting patterns in data in order to discover or uncover meaningful and critical insights and relationships. Several techniques may be adopted for the purposes of detecting regularities, proper structures, and clearly discernible trends, which are further used in order to make meaningful predictions, concrete classifications, and to gain a deeper understanding of complex and seemingly intractable issues. We may also arrive at generalizations or generalized conclusions which can be used as useful input data for similar studies. Such approaches are referred to in science as nomothetic approaches, and are contrasted with idiographic approaches.
- Combination with synchronic-diachronic studies: Synchronic-diachronic studies towards the cause of which we had dedicated and entire research paper, are a combination of temporal and spatial analysis. The two terms originated in the context of linguistics, though we propose they be suitably extended to all fields of the social sciences, with virtually no modifications. Such studies are indeed essential and necessary in several branches of the social sciences, though they are seldom performed. We had also introduced the concept of motion variables in this context, - as their bidirectional movement must be observed carefully to elicit meaningful insights, though the term motion variables has a different connotation currently.
- Qualifying if necessary, and identifying the risks involved: A risk is a situation involving exposure to uncertainties or danger. Risk analysis must be systematically, meticulously and periodically performed in order to uncover risks of different types and categories. Compensating and mitigating strategies and techniques must then be put in place. In some fields of study, these are known as controls. Risks must be identified and addressed at every stage of the research process.
- Identifying potential exceptions to the analysis: Identifying potential exceptions to every conclusion must be carried out on a systematic and a continuous basis and we had referred to this as exceptionism; We had also referred to this as the sociological ninety ten rules as a handy moniker, and had even dedicated an entire paper to this. As a part of this general exercise, exceptions must be sought out proactively, and distinct research strategies formulated to address them. Exceptions would be of vital and paramount importance to the social sciences we have argued, and this would differentiate social sciences, and set it apart from the other sciences.
- Providing a path of remedial action wherever possible: We must also provide a clear path to remedial action wherever possible, and devise remedial action strategies as quickly, as early and as comprehensively as practically possible. Remedial actions refer to course-corrections, and actions taken to counter or annul observed deficiencies and anomalies.

➢ *Examples to Illustrate How Sociological Research must be Performed*

We not present below some suitable examples to illustrate how sociological research must be performed from our perspective, and from the point of view of this paper. We believe that these examples are highly representative of different kinds of social sciences research, and many of them are quite humorous and amusing too. While some readers may complain that examples from economics have been given the short-rift, this is somewhat deliberate. Economics is an altogether different animal that deserves to be treated separately.

➢ *Awareness Regarding Pollution in India*

Pollution is a major and a serious issue in India, particularly in its large and busy cities. Global warming is also a hot button topic and an issue of major and serious concern in India, more so given the fact that is sits on a global warming hotspot. Many people have strived to increase awareness regarding global warming, more so, stalwarts such as Al Gore and Rajendra Pachauri. How did each individual raise awareness about global warming, and what impact did each of their efforts have? How did various non-governmental organizations raise awareness about global warming? How did various national governments shape awareness about global warming? What effect did they have, and what cause did they serve? What role did people's – particularly those of thinkers and leaders - personal experiences play in shaping global warming? What are the causation variables, intervening variables and effect variables here? Can causation be clearly identified and demonstrated in this context? Is the study itself meaningful and beneficial? Can reliable conclusions be drawn? These are some of the questions that we must ask. As an extended study, we may wish to assess and analyze calls for lower population growth due to excessive resource consumption versus calls for lower population growth due to

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excessive environmental pollution and environmental degradation. Which of these holds good and why? How do patterns change over time? Can a holistic analysis be performed? What would be the limitations and bottlenecks? [6] [7]

- *Maggi Noodles was Meant to Supplant Traditional Indian Breakfasts*

Maggi noodles were meant to supplant traditional Indian breakfasts. How did it fare here? Traditional Indian breakfasts may have changed over time. How did they change? Why did they change? Can a qualitative assessment of changing consumer preferences be carried out? How did it impact the demand for Maggi noodles? What are the causation variables? What are the intervening variables here? What are the effect variables here? How can a correlation be established? What is the impact of changing consumer tastes and changing consumer preferences on the demand for Maggi noodles? How do we track changes to variables over time? What role does culture play here? Is it possible to initialize, track and monitor cultural variables? How are all the factors correlated, and why are they correlated?

- *Cultural Factors Impeding Africa's Development*

What are the factors impeding Africa's development? How can developmental indicators and developmental outcomes be defined? What research design do we adopt here? How must the research be performed? How can factors be split up into cultural and non-cultural factors? How do we measure these across space and time? What are the variations across nation and community, and why do these persist? How do we bridge chasms through interventions, and how do we measure the success of these interventions? How do we bring laggards up to speed, and how do we learn from well-performing nations? What is the multi-dimensional relationship between variables, and how do we measure them? What will the qualitative component of research here, and what will be the quantitative component? [8]

- *How much English Proficiency is Required for Success in Various Fields?*

How much English proficiency is required for success in various fields? Can we tie this to the theory of linguistic expectation and the theory of non-linguistic expectation? How does the theory of linguistic expectation and the theory of non-linguistic expectation vary for different professions? How do these change over time? How can we relate this to synchronic-diachronic studies? How will language dynamics change, increasing or reducing the demand for the English language? What are the variations across culture and job market? Do these variations converge or diverge? What is the level of performance of non-English speakers versus performance of English speakers in various professions? What role does the English knowledge play in such differences? Are such differences systemic or coincidental? What role does the knowledge of other languages play here? Can technical skills override the absence of linguistic skills? Can English skills be acquired from English medium schools alone, or can they be acquired from vernacular schools? What role does the ranking and rating of schools play here? What is the connection between the level of English proficiency versus success in life? Are attitudes of employers towards the English language changing? If so, how and why? What research design do we adopt to carry out all the above studies? [9]

- *Fertility Studies*

We may also wish to perform and carry out studies on total fertility rates as follows: What are the different causes of low fertility rate? What are the causes of high fertility rates in some cultures? How do they operate in unison, and in conjunction? What are the interrelationship between various factors such as female literacy, higher income, government pensions and the like, and how do these factors cross-influence each other? How do these factors change over time, and how can such changes be quantified? Is there any correlation between the number of children couples have and their ability to educate them? If more educated people procreate less? How will this affect the quality of human resources in the long-term? How will this affect the economy since high-profile individuals tend to be high spenders? Will be ever reach as stage where people will procreate in the ratio of their ability to produce high-quality human resources? How do we define high-quality human resources, and what are the other determinant factors in this context? What is the impact of low fertility rates on real wages? How do we study this across space and time? What is the impact of low fertility rates on GDP growth? How do we study this across space and time? What is the impact of pronatalist policies on quality of human resources given the fact that the poor may respond more proactively to such calls? What are the causes for fertility rate decline and different rates in different countries? Will the momentum and trajectory be maintained? Will children taking care of their parents in their old age determine total fertility rates in a different context or situation? Why is parents' confidence in children eroding? What aspects of the above study are reliable, and what aspects of the above study are unreliable? How is the anti-natalist movement in Bangalore working? What factors are contributing to people deciding not to have kids in Bangalore? Are impacts of low TFR in USA, India, and Japan different given the fact

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[7] Doney, Scott C.; Fabry, Victoria J.; Feely, Richard A.; Kleypas, Joan A. (2009). "Ocean Acidification: The Other CO_2 Problem". *Annual Review of Marine Science*. **1** (1): 169–192

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that the USA is a consumption oriented economy, and that Japan is an export-oriented economy. What is India's situation given the fact that India has plenty of surplus labour? [10]

- *Is the Importance Given to Education by People in a Given Area Increasing or Decreasing?*

Is the importance given to education by people in a given area increasing or decreasing? If so , what are the causes? How can government policies and government intervention help? Is the importance given to education by people in a socioeconomic groups increasing or decreasing? If so, what are the causes? How can government policies and government intervention help? What types of interventions specifically are required? How can the impact of such interventions help? Can legislation help, and if so what clauses should be inserted? What is the impact of child labour on education? What is the impact of child labour legislation on education? What is the correlation between parents' income level on children's' education? What is the correlation between parents' educational attainment levels and their children's' education? Can a neutralization of forces ever happen to produce equal outcomes? How do we initiate and measure causation variables, intervening variables and effect variables? What will be the qualitative and the quantitative components of such an analysis?

- *Other Social and Cultural Studies*

Here are some interesting questions: What are the attitudes towards unmarried men in a given area? What is the variation by group or class? How are such attitudes changing? Why are they changing? What are the attitudes towards unmarried women in a given area? What is the variation by group or class? How are such attitudes changing? Why are they changing? What are the different causation variables in each context? What are the intervening variables and what are the effect variables? Are there any secondary effects involved? Can studies be replicated in other contexts and cultures? If so, why? If not, why? Is there any correlation between fertility and IQ? Is there any correlation between wealth of a nation and IQ? The last two studies are probably egregious. How do we prove that they are egregious? Is a computation of mathematical value of emic perspectives of various elements and attributes of a cultural taxonomy possible? What are the risks and uncertainties involved in such a quantification, and is such an exercise generally reliable? Is a computation of mathematical value of etic perspectives of various elements and attributes of a cultural taxonomy possible? What are the risks and uncertainties involved in such a quantification, and is such an exercise generally reliable? Is a reconciliation between emic and etic values possible? Why do people see each other differently? Can cultural worlds be bridged? How can we identify cultural bias? How do we measure and quantify counter cultural bias? Do these effect each other, and is a reconciliation ever possible?

How do we identify, assess and quantify bias in the review of other scholars work? How much of such bias is cultural, and how much is individual, i.e. non-cultural? Does an individual oppose a culture or a language? If so why? How do we quantify opposition? How can we work proactively to bring about a change in attitudes? Is there any correlation between India's economic performance and the self-confidence of Indians? How do we measure this? How many of the above studies are reliable, and if they are unreliable, why are they unreliable? What are the risks involved, and how do we propose countermeasures? Let us evaluate the relationship between two individuals. What factors cause the relationship to improve? What factors cause the relationship to deteriorate? What are the effects of an improving relationship? What are the effects of a deteriorating relationship? How do we propose a path of remedial actions? What are the causation variables? What are the effect variables? What is the relationship between effect variables? How do we establish a cause and effect chain? Are such studies reliable? What are the causation factors that determine sociocultural change? How do these drive sociocultural change? Can causation be clearly established?

We also have another unanswered and potentially useful question in linguistics. It is a very well-known fact that Sanskrit, which comprises two primary variants, namely Vedic Sanskrit and Classical Sanskrit is vocabulary-rich. Is it not reasonable to expect from the detailed step by step and century by century acculturation model that we had prepared and presented in several of our previous publications and papers, that many of these worlds came from the Indus valley civilization, in addition to being internally generated or derived from Old Avestan? What are the pitfalls and risks associated with such a hypothesis? Will it lend credence that the Indus script was a full-fledged logo-syllabic script as we had proposed? What are the risks and the pitfalls associated with the second hypothesis? This is an interesting case, because we infer the effect, but do not know the cause. Additionally, and not in any way related to the above, how can we assess mind-orientation, cultural-orientation, mindspace, thought worlds, and worldviews, qualitatively, and then quantify our observations? What would be the risks in our approach? Good food for thought, indeed. Also, suppose Mahindra wants to launch a car in Australia, how are customer variables captured, and translated into products? Identifying sociocultural variables, both causation ones, and effect ones, must be practiced by force of habit, and by dint of habit, until it becomes second nature. [11]

[10] How Fertility Changes Across Immigrant Generations." *Research Brief #58*, Public Policy Institute of California, 2002

[11] Identifying tools and techniques for picking out cultural bottlenecks: Another crucial component of the symbiotic approach to socio-cultural change IJISRT, October 2024 Sujay Rao Mandavilli

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➢ *Is there Any Correlation Between Race and IQ?*

Many social scientists frown on the word race as an artificial and an antiquated construct, and have called for replacing the problem-ridden term race with the word "ethnicity" to refer to groups of people based on their shared culture, ancestry and history, along with ethno-biological attributes. The term race fell into gradual decline after the Second World war, and racism was condemned in severe terms by the United Nations and other agencies. The term is as such largely seen in a negative connotation, and a negative light today. Another criticism is that race is a static definition and not a dynamic definition as miscegenation occurs all the time. We have different types of IQ tests such as cognitive abilities tests, differential ability scales, differential ability scales, Naglieri nonverbal ability tests, Otis Lennon school abilities test, Stanford Binet tests, etc. We also have fluid and crystallized scores, and IQ tests as such do not offer absolute bullet-proof certainty. Therefore, any attempts to correlate "race" and "IQ" may be erroneous and prejudice-laden. Social sciences have yet to mature, and many studies are of poor quality. [12] [13]

➢ *Urban Dynamics*

Let us evaluate the construction of the Navi Mumbai international airport. How many planes will get diverted from Chattrapathi Shivaji international airport to the new airport? How many services will remain in the old airport? How will this impact population dynamics in the Mumbai metropolitan region? How many people will shift out of Mumbai into Navi Mumbai? How many people will shift from other areas to Navi Mumbai? What are the probabilities of different scenarios? Will the airport have an impact on urban dynamics at all? How do we evaluate probabilistic causation? Let us evaluate the construction of NAINA city in Maharashtra. How will this impact population dynamics in the Mumbai metropolitan region? How many people will shift out of Mumbai into NAINA city? How many people will shift out of Navi Mumbai to NAINA city? How many people will shift from other areas to NAINA city? What are the probabilities of different scenarios? What are the similarities and differences between the above two case studies? How reliable are cause and effect studies in this regard? Are authorities aware of urban dynamics? How do we generate awareness in various stakeholders? What are the hidden and latent risks in any studies? We may also apply conditional causation here i.e., the factor is necessary, but not sufficient, and other factors may also be involved. For example, the success of NAINA city may be contingent on a new flyover, bridge, railway line, etc. [14] [15] [16]

➢ *How do Marxist Intellectuals See the World?*

How do Marxist intellectuals see the world? For this, understanding Marxist ideology is a must. Performing a thorough analysis of Marxist ideology is absolutely required. Deriving factors from an analysis of Marxist ideology will also need to be performed. How does ideology impact perceptions, thought worlds, world views and decision outcomes? Identifying causation variables or factors is required. We must also establish a cause and effect chain, identify effect variables and clearly establish relationships. The underlying risks behind such a study also need to be stated upfront. Can such a study at all be performed reliably? If so, why? If not, why?

➢ *How does Language Ideology Affect Linguistic Proficiency?*

The term language ideology is becoming an increasingly important issue in linguistics and in social and cultural anthropology. In sum, language ideology refers to the sum total of beliefs and attitudes that people have about language and the role it plays in shaping society. It also crucially probes and investigates how language may be perceived, used, and evaluated, often both explicitly and implicitly in relation to social identities, cultural mores and norms, and power dynamics. Therefore, language ideology may be perceived as a crucial mediating link, and an intervening variable. Therefore, there may be a general belief in India that the English language is superior, and this causes people to learn it more. Elites may also see themselves to be superior to the rest of the Indian population, and this may cause them to swivel towards English. Causation, intervening and effect variables must be carefully defined, with exceptions noted, and questionnaires, surveys, interviews, and other qualitative techniques used. Also, additionally, does ethnic pride decrease the amount of importance people give the English language? How do we measure this? [17]

➢ *A Country's Development in Inversely Proportional to its Total Fertility Rate*

[12] Bartlett, Steve; Burton, Diana (2003). *Education Studies: Essential Issues*. Sage

[13] Aligning theorization and hypothesis-building with cultural and cross-cultural frames of reference: A heuristic aid to better theorization and hypothesis-building Sujay Rao Mandavilli IJISRT June 2024

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[16] Delineating "Cultural limits" and "Anthropological limits" as central theorems in the social sciences: Some more useful and practicable techniques for social sciences research Sujay Rao Mandavilli This paper is based on my paper on Anthropological economics and has been published directly in Social Sciences Research Network (SSRN) in July 2024

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We may also investigate the hypothesis, "Is a country's development in inversely proportional to its total fertility rate?" If so, why? If not, why? What is meant by development here? Is quantification possible? Can metrics and measures be developed to measure development? Is there any element of certainty involved, or are we dealing with fuzzy logic here? We believe that the meaning of the term development in this context is erroneously and notorious unreliable and hazy. Total fertility rate can of course be measured, though we need reliable surveys in this context. There may however be a direct and a measurable correlation between "development" and TFR. We need a large number of studies involving cases studies, and an inductive approach. Intervening variables need to be defined, and exceptions to this rule systematically investigated. [18]

- *Children Who Grow Up without Love and Affection Grow Up Feeling no Empathy for Others*

Causation variables could be neglect or lack of attention, maternal abuse, parental abuse, improper schooling, etc. one must however, take care of overlapping variables, a concept that we had discussed previously in this paper, and carry out a perfect and a well-rounded study. In many cases, people can be interviewed, surveys carried out and original data and feedback obtained. This should be relatively easy except for events that happened in the past, or the remote past, and in such cases, historical data needs to be obtained. We can have many cases, for example, the case of Josef Fritzl the monster of Amstetten, the strange case of Natascha Kampusch, the case of Peter Niers, the infamous German of the sixteenth century, the case of the Mexican Angel Maturino Resendiz. We may also probe and investigate how Sanford Clark was treated by Gordon Stewart Northcott in Wineville or Mira Loma in the 1920's. The last case is particularly data rich, and we have autobiographies and plenty of archival data and secondary data. We also then have the strange case of Dr Jekyll and Mr Hyde a novel that we penned by the English Author Robert Louis Stevenson in 1886. We also then have the very interesting case of Buffalo Bill who was a famous American soldier, bison hunter, and a great showman of the late nineteenth and early twentieth centuries. Why did Rustom Cama and Bhikaji Cama think differently even though they were married to each other for several long years? How did all these behavioural patterns come about? How did Gandhi's experiences in South Africa shape him? Is this a one off instance, or can patterns be identified? We need to define a set of causation variables and effect variables here, though we may make use of other techniques such as the ethnography of enculturation, the sociological ninety-ten rules, and the certainty uncertainty principle. [19]

- *Do People with a High IQ have a Low EQ?*

An intelligence quotient (also abbreviated to as IQ in short) refers to a total score that is derived from a set of standardized tests or subtests that are primarily designed to assess and evaluate human intelligence scores. While originally, IQ as a score was obtained by dividing a person's mental age rating, by the person's physical age in years, which was then multiplied by a factor of one hundred to obtain the final IQ score, nowadays however, normal distributions are more often used. Emotional intelligence, which is measured by means of emotional quotient, is a rather more recent and a modern concept, and refers to the ability of an individual to understand, manage, and handle emotions. High emotional quotient reflects a greater understanding and awareness of the self and surroundings. It is generally believed or assumed that a high IQ means a lower EQ and vice versa. In this case, IQ may be taken to be the causation variable, while EQ may be taken to mean the effect variable. The relationship between the two is by no means certain; as a matter of fact, it is notoriously unreliable. We are stepping into the domain of statistical laws here, not causal laws. We may also take into account and consideration the concept of probabilistic causation here; in this case, the relationship between the two variables in purported to be inverse; this may most often be the case, though not always. Some people with a very high IQ may also have a very high EQ. We must also bear in mind the fact that correlation and causation are two different things; correlation does not always imply causation. Therefore, social sciences research is an altogether different animal here; not only is qualitative data most often used, but logic and reasoning is almost always necessary. We also recommend an inductive approach here, and a case study method. Large tomes of data must ideally be studied in order to uncover patterns, and make informed assessments. [20] [21]

- *Jaguar's Product Rebrand Disaster*

Jaguar is currently thought to be undergoing a major bottom-up corporate restructuring transformation, rapidly phasing out its lineup of petrol-powered vehicles and transitioning to an all-electric product portfolio. The brand logo and the brand messaging was also changed, and an emphasis placed on SUV's. This marked a departure from the traditional sports car image. Jaguar's recent marketing efforts, especially its rebrand, have been considered to a disaster, resulting in a backlash from loyal customers and a catastrophic decline in sales which essentially fell off a cliff. This strategy obviously failed, and proper investigative research may be required to be performed in order to figure out why this happened. For

[18] Craig, J (1994). "Replacement level fertility and future population growth". *Population Trends* (78): 20–22

[19] Fisher, Barry A. J.; William J. Tilstone; Catherine Woytowicz (2009). *Introduction to Criminalistics: The Foundation of Forensic Scien*

[20] *Matarazzo, Joseph D. (1972). Wechsler's Measurement and Appraisal of Adult Intelligence (5th ed.). Baltimore, MD: Williams & Witkins.*

[21] Plomin, Robert; DeFries, John C.; Knopik, Valerie S.; Neiderhiser, Jenae M. (2013). *Behavioral Genetics* (6th ed.). Worth Publishers

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example, we may want to quantify and assess people's loyalty to the logo, loyalty to the all-petrol image, distaste for electric vehicles, and preference for sedans. All these need to be quantified as causation variables, and initialized appropriately. Their impact of effect variables needs to be ascertained through the appropriate use of qualitative research techniques. We have several other cases from the automobile industry. For example, Tata Nano of 2008 failed because it sought to create a new product segment, because people saw it as a no-frills products, and because the Maruti Alto or other second-hand cars could be had at a slightly higher cost. We also had the decline of Packard in 1956 after it merged with Studebaker causing it to lose its sheen, attracting the ire and wrath of fans and die-hard loyalists. The new products were even derisively referred to as Packardbakers. The success of Chrysler 70 in 1924 holds inspiration because customers got a well-conceived and a well-rounded product at an affordable price. It was fast for the day, reaching a speed of 112 km/h. The failure of the Ford Edsel in 1957, however, holds lessons was many – as it was launched at the time of a recession, had confused product positioning and controversial styling. A subsequent redesign did not help, and the brand was discontinued three years later. Likewise, the decline of the Ford model T in 1927 happened due to the fact that it was a antiquated product, and the benefits of its low cost had expired in the eyes of its customers. Therefore, we may also make use of enumeration here, and such techniques can be used for predictive modeling too; for example, will the relaunched Tata Nano of 2025 succeed? If so, why? If not, why? How can we break up all the above studies into factors? Which factors are weak and which factors are strong? How do we quantify their strength? [22]

- *A British Think Tank Predicts that India's Total Fertility Rate will Reach a Certain Level by 2050*

A British think tank recently predicted that India's total fertility rate would reach a certain level by 2050, as a matter of fact, around 1.29 children per woman. The name of this think tank was the two centuries old Lancet. How was this precise figure arrived at? Is there any underlying basis for this computation, and if so, can it be made public? What are the various causation variables portrayed, and how do the impact effect variables multi-dimensionally? Can we demand that the entire methodology be made publicly available? Since this prediction is about the future, will it be reliable? Do course corrections need to be made from time to time? What are the assumptions made in this regard? Do these assumptions need to be revisited from time to time? [23] [24] [25] [26] [27] [28] [29] [30]

- *Circular Cause and Effect*

Another important concept that we must describe here, and it this juncture is that of a circular cause and effect chain, which is also often known as a causal loop, given that is defines a system where the output of a process or event acts as an input to another process of event, thereby creating a loop or cycle in the process. In other words, effects often become causes, and causes often become effects, making it a continuous loop instead of a linear unidirectional relationship. These loops are primarily classified into reinforcing loops (positive feedback loops) and balancing loops or counter-balancing loops (negative feedback loops). In case of reinforcing or positive loops, an initial push representing an initial change leads to a further cascading change in the same direction. For example, increased sales lead to resources being available for more advertising, which in turn leads to even more sales. This process continues until some logical or practical limit is reached. Likewise, population growth increases the population base, which in turn boosts population growth. In case of a

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

[30] 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

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balancing or a negative loop, an initial push leads to or promotes a countervailing force. For example, if a company decides to increase the price of one of its product, demand naturally falls depending on the elasticity of demand, and if demand falls, the company may be left with no other option but to reduce the price again. Therefore, the original situation is again reached.

From the point of view of the social sciences, and social sciences studies, we may have an indeterminate scenario, where the result or the direction of the result is indeterminate. We must posit or postulate this as a third scenario in this case; This will apply to the social sciences where the vagaries of human nature are of paramount importance and supersede. For example, let us analyze the interrelationship between population growth and economic growth – population growth may increase or decrease with income levels – social sciences are inexact – qualitative research is required, and inductive research is required. There may be a variation based on the culture or society in question. Let us provide another example; For example, students from underprivileged backgrounds may be humble, or they may become belligerent to even out inequalities. This may vary on a case to case basis as human behavior is inexact or imprecise. Therefore, ethnographic studies are of paramount importance, and patterns unearthed, though only to the extent possible.

II. CONCLUSION

The core objective of this entire paper was to demonstrate by means of suitably crafted and illustrated examples, how we believed qualitative research should be performed for various fields and sub-disciplines of the social sciences. We also then went on to describe the concept of quasi-statistical research design here, a concept that we believed needed to be popularized in a previous publication of ours. This paper was also then aligned with our previous concepts of motion variables and a synchronic- diachronic analysis of research questions. We began this paper suitably and appropriately by defining what variables were, and reviewing different types of variables, and research design. We also then explained what social and cultural variables were, and how they could have a bearing on this paper. We also then proposed and presented the various steps of our postulated approach, such as causation, probabilistic causation, and cause and effect analysis, so that a great degree of transparency could be accomplished. The examples provided in this paper were both variegated and refreshing, and provided meat, substance, and overall direction to our paper. We believe that this will be a very useful and important paper, because it provides a template that may help social science researchers to break free from a non social sciences mold, and accomplish research that is of foundationally and fundamentally better quality.