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Pursuing Bullet-Proof Research Design: Towards 360 Degree and Stakeholder-Driven Research Design for Better and Faster Scientific Progress

Sujay Rao Mandavilli

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Abstract: The objective of this paper is to emphasize the need for reliable and bullet-proof research designs. We begin this paper by discussing what a research design is, tracing its history, and discussing the types of research design as well. We then emphasize the need for 360 degree approaches to research design, and also trace it to our previously published COMPASS model. We also differentiate between a hypothesis and a research design in order to bring out the importance of research design in scientific studies. We emphasize the need for stakeholder-driven approaches in this paper, along with interdisciplinary and transdisciplinary approaches. The need for cross-cultural approaches to research, and cross-cultural research design is stressed along with dialectical approaches. We also discuss previously-published, but less than ideal studies such as fertility and IQ studies, national IQ studies, race and IQ studies, and some other examples to add substance to our paper. We hope, anticipate and expect that the present paper will become a vital one in twenty-first century research studies, as it can go a long way in ensuring a reliable and robust research design.

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I. INTRODUCTION

The objective of this paper is to emphasize the need for reliable and bullet-proof research designs. We begin this paper by discussing what a research design is, tracing its history, and discussing the types of research design as well. We then emphasize the need for 360 degree approaches to research design, and also trace it to our previously published COMPASS model. We also differentiate between a hypothesis and a research design in order to bring out the importance of research design in scientific studies. We emphasize the need for stakeholder-driven approaches in this paper, along with interdisciplinary and transdisciplinary approaches. The need for cross-cultural approaches to research, and cross-cultural research design is stressed along with dialectical approaches. We also discuss previously-published, but less than ideal studies such as fertility and IQ studies, national IQ studies, race and IQ studies, and some other examples to add substance to our paper. We hope, anticipate and expect that the present paper will become a vital one in twenty-first century research studies, as it can go a long way in ensuring a robust and an inclusive research design. This paper extends our paper on cross-cultural research design, and is related to it without violating , contradicting or transgressing any of its principles. [1] [2] [3]

- *What is Research Design?*

We must begin this paper by discussing and explaining what exactly a research design is. Simply put, a research design refers to a comprehensive plan that clearly delineates how a research study will be conducted, and what its several stages and steps will be. A research design also acts as a blueprint and a template, guiding researchers accurately through different stages of the research process, beginning from a definition of the research problem to the analysis of data. The objective of a well-defined research design is to make sure that the research study is well-structured, carefully thought through, precise,

[1] McRaney, David (2022). *How Minds Change: The Surprising Science of Belief, Opinion, and Persuasion*. New York: Portfolio/Penguin

[2] Gauchat, Gordon William (2008). "A Test of Three Theories of Anti-Science Attitudes". *Sociological Focus.* **41** (4): 337–357

[3] Marburger, John Harmen III (10 February 2015). *Science policy up close*. Crease, Robert P. Cambridge, MA: Harvard University Press

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rigorous, and produces reliable, consistent, predictable, and valid results always. A research design begins by defining the research problem, or the issue that needs to be addressed through the mechanism of research. Data collection methods are then specified, and these may include surveys, interviews, questionnaires, and experiments. A sampling strategy also needs to be prepared as a part of the research process, and sampling and non-sampling errors identified. Data analysis also needs to be performed subsequently, and a strategy prepared for the same. Analysis may be accomplished either through a statistical approach, qualitative approach, or a quasi-statistical approach.

Measures will also need to be implemented to ensure validity and consistency of research results. Any research design that yields imprecise, inconsistent or erroneous results is deemed to be fundamentally flawed and poorly-designed. As they say, the proof of the pudding lies in the eating. The research design must also specify the type of research being performed (whether it may be descriptive research, co-relational research, quasi-experimental research, experimental research, etc). It must also specify the research problem to be resolved, underlying hypotheses, list of independent, intervening and dependent variables, data collection methods, and data analysis techniques. The research design must also come with a traceability matrix that traces the research problem end to end. [4] [5] [6]

Research design has evolved significantly over the ages, and early forms of it as mooted by early philosophers such as Aristotle, Plato and Socrates, were firmly entrenched in philosophical inquiry with some practical observation added later on. More concrete and robust research methods developed along with the rise of formal scientific methods and the institution of social sciences, with major progress having been accomplished throughout the course of the twentieth century, particularly after the end of the Second World War. Empirical observation and experimentation were also later added, and major progress was made throughout the renaissance and enlightenment era. It is even said that the great inventor and polymath Leonardo da Vinci meticulously and painstakingly made notes of his observations, and systematically documented all his findings. The design methods movement of the 1960's with the involvement of Bruce Archer and John Chris Jones led to the formalization of research design methods. Progress may have largely plateaued since then, with Eurocentrism ruling the roost in the 1970's. The post-colonial movement too proved to be largely unscientific, and we must set right this anomaly. [7] [8]

There are many ways by which research designs can be classified. Research designs are often classified into qualitative research design, quantitative research design, mixed methods research design, and a quasi-statistical approach. We had discussed and debated all this previously, and had even thrown new light and new meaning to the term "quasi-statistical". Research designs may also be descriptive and may describe the characteristics of a given situation (for example, they may include case studies, naturalistic observations, and surveys); they may also be correlational and examine relationships between variables (for example, they may include case control studies and observational studies); they may be experimental and determine cause and effective relationships, (for example, they may include field experiments, controlled experiments, quasi-experiments); they may pertain solely to reviews such as literature review and systematic reviews, etc. In some cases, a meta-analysis or analysis of data may need to be performed. Confirmatory research seeks to confirm a pre-existing hypothesis, while exploratory research examines datasets in order to identify patterns of correlation between them. State problems study the given state of a phenomenon at a period in time, while process problems analyze changes over time. Research designs may also be fixed or flexible to any given degree, and with respect to one or more of their characteristics or attributes.

- *Approach Adopted in this Paper*

We had also recommended 360 degree approaches previously, particularly with respect to hypothesis formulation and evaluation. This would naturally require, and also encompass wide and overarching perspectives on any given issue. We had also proposed the COMPASS model in a previous paper, and each of the letters in the preceding words would stand for comprehensiveness, objectivity, multidisciplinarity, precision, accuracy, stringency, and systematicity, respectively. There are also many Fundamental differences between hypothesis and research design. A hypothesis is a specific, and a testable statement that is made at the commencement of a study, while research design represents an overall and overarching plan or framework for conducting the study, clearly specifying the methods, tools, techniques and procedures that are to be used. Therefore, a hypothesis only defines variables and postulates a set or series of relationships

[4] Robson, C. (1993). Real-world research: A resource for social scientists and practitioner-researchers. Malden: Blackwell Publishing

[5] Diekmann, Andreas (2011). "Are Most Published Research Findings False?". *Jahrbücher für Nationalökonomie und Statistik*. **231** (5–6): 628–635

[6] Creswell, J.W. (2012). Educational research: Planning, conducting, and evaluating quantitative and qualitative research. Upper Saddle River, NJ: Prentice Hall

[7] Mantel N, Haenszel W (April 1959). "Statistical aspects of the analysis of data from retrospective studies of disease". *Journal of the National Cancer Institute*. **22** (4): 719–748

[8] Cheung AC, Slavin RE (1 June 2016). "How Methodological Features Affect Effect Sizes in Education". *Educational Researcher*. **45** (5): 283–292

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between them, while a research design provides a clear plan and a roadmap for testing the hypothesis.

We also recommend carrying forward all the elements and essentials of our paper on 360 degree hypothesis formulation. However, our paper on 360 degree approaches to hypothesis formulation is much more comprehensive, given the nature of the issue involved. We must also naturally adopt a stakeholder-focused and a stakeholder-driven approach at all times. Who are stakeholders? Stakeholders refer to individuals who stand to gain or lose from an outcome of a research area, or a topic of study. For example, studies pertaining to race and IQ study may adversely impact some individuals and their points of view also need to be naturally always taken into account and consideration. We had written about identity theory extensively in the past, and this represents a fundamental reality; it would be naïve and foolish to brush it under the carpet without further ado. The entire process of colonialism was naturally driven by vested interests, and colonizers did not obviously did not consider oppressed or subjugated peoples in any step of the decision making process. Thomas Babbington Macaulay and others even suggested that native Indian knowledge and knowledge systems were pretty much useless and worthless. Did they take any views of Indians into account? Indians may also likewise myopic given their lack or exposure, but all this may change in a generation or two. 360 views therefore means taking all relevant and pertinent views into account, and developing hypotheses, paradigms, frameworks, and research designs accordingly.

Stakeholder-driven approaches would also naturally involve taking into account and consideration, interdisciplinary stakeholders, and transdisciplinary stakeholders as well. Therefore, stakeholders from all areas of study that may potentially be impacted – either positively, or adversely, must be involved in the formulation of the research design. The research design can of course be modified at a later point in time as and when more stakeholders are identified; however, there must practically be as less rework as possible, and all issues must be clearly stated upfront. This will also ensure that other parties are not harmed, or their concerns ignored, and that this is factored in right from the beginning of the research process. Cross-cultural studies must also be encouraged at all times, and cross-cultural research design adopted along with dialectical approaches. Cross-cultural research design requires researchers to systematically and methodologically compare phenomena across different cultures to understand not only cultural similarities and dissimilarities, but also the influence and impact of culture on human behavior and the breadth of human experience. While many useful concepts do already exist, they are seldom assiduously or rigorously followed in the real world, even in important and crucial studies; hence, this paper. [9] [10] [11] [12] [13]

➢ *Some Useful Examples*

We now review some potentially very useful examples below to boost and bolster our case. As a matter of fact these would be so obvious, that they could even be considered no-brainers. Many more can be found, but we will limit the number of examples here, in the interests of space and time. We leave it to researchers to rack their own brains accordingly and come up with more examples of their own. There will of course be no dearth or paucity of real-world examples; much of present day research in many segments fails to meet the mark, or fails to cut the ice.

➢ *Fertility and IQ*

The claimed relationship between fertility and intelligence (whatever the latter may mean) has been investigated repeatedly in several research studies. Some researchers claim that, measures of intelligence such as educational attainment and literacy (however, intelligence, whatever that may mean, and however that may be measured, is quite different from both education and literacy) are negatively correlated with fertility rate in “some contexts”. This is an egregiously bad statement, and there are several non-sequitors involved, along with a poor definition of terms. This only goes a long way to show that scientific method and scientific objectivity still have a long way to go. Such studies are also mostly seen to be western-centric, and such research designs may be deemed to be non-representative and non-comprehensive from our perspective. We have also stressed and emphasized the need for self-contained scholarship in the past. While some correlation may have been established in the past to attest to the above claim, we must understand that correlation or association does not automatically imply causation. Other factors, such as differentials in educational attainments may have been involved. That is why we need synchronic diachronic studies as well, and more involved and multifaceted research. Some subjects around a century ago were even initially

[9] Minimizing the time taken between hypothesis generation, hypothesis testing and refinement: A necessary adjunct in the epoch of fast-paced science Sujay Rao Mandavilli IJISRT, August 2025

[10] Towards 360 degree approaches to hypothesis formulation and evaluation: Another epochal milestone in twenty-first century science Sujay Rao Mandavilli Published in IJISRT, July 2025

[11] Towards “Thick analysis” of statements, propositions and assertions: Compendious evaluations with immense benefits in research Sujay Rao Mandavilli Published in SSRN, July 2025, IJISRT, July 2025 and elsewhere

[12] Amplifying the importance of synchronic-diachronic approaches in social sciences research: Unleashing the power of this technique for better sociocultural analysis Sujay Rao Mandavill Published in IJISRT, July 2025, SSRN, July, 2025

[13] Establishing the importance of self-contained scholarship in twenty-first century science: Selfcontained scholarship as an essential prerequisite for scientific progress Sujay Rao Mandavilli SSRN, December 2024

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identified from who's who listings; of course, this is not a representative samples; these can be avoided if a 360 degree approach is adopted; we also need post-publication review of research in addition to normal peer-reviews; we have been harping on this for a long time. Similar studies performed by Osborn and Bajema in the 1970's reached similar conclusions, though they may be dubious, and open to scrutiny.

Herrnstein and the political scientist Charles Murray, in their best-selling book "The Bell Curve", (published in 1994) argued that the average IQ of people of the United States was declining due to both skewed fertility rates and large scale immigration of groups with lower IQ levels than pre-existing American populations. Other studies such as those performed by Daniel R. Vining Jr, and Retherford and Sewell, have yielded different and inconsistent results; such deviations must be thrown out of the window as more balanced research is pursued. Some studies are quasi-political in nature; much of so called research is targeted at popular audiences, Results of research are often proclaimed or deemed to be conclusive even when they are not; since the 1990's, East Asia has the lowest levels of fertility observed anywhere in the world throughout recorded history; fertility levels of Blacks in the USA are also mostly below replacement. [14]

- *Nations and IQ*

The claimed or supposed relationship between nations and IQ or intelligence quotient scores is yet another controversial area of study, and this pertains to claimed or supposed differences between nations in average intelligence test scores, an investigation into their possible underlying causes, and their indirect correlation with measures of social well-being and economic prosperity. This is an extremely bad approach to research too, given that most nations are highly multi-ethnic, the United States included. This debate began in the 2000's when researchers Richard Lynn and Tatu Vanhanen constructed studies and published their IQ estimates for different countries across the world on the basis of literature reviews, student assessment models, besides several other methodologies. The results and conclusions arrived at by this duo stirred up a great deal of controversy, and their approach was severely criticized by "The European Human Behavior and Evolution Association" who formally issued a statement in 2020, teaming this work unscientific.

Subsequent research by eminent psychologists Earl B. Hunt, Jelte Wicherts and Heiner Rindermann has attempted to identity the underlying non-obvious causes or potential or claimed national differences in IQ, and a correlation with other variables such as GDP, life expectancy, and governance. Such studies also many not be fully scientific, given the fact that the logic and reasoning they employ may not be sound. The relationship between independent, dependant and intervening variables must be clearly established at all times, and logic and reasoning must be sound. As we have always said, keep asking why (even how) questions – as many of them as possible – until all answers to questions are satisfactorily found. This will be the acid test of any research process; also refer to our paper on the certainty uncertainty principle which can be widely used in research processes with unimaginable benefits. While we do agree that productivity levels and scientific output in many parts of the world is still abysmally low, there could be many causes for this, and certain factors must be constantly counterweighed against uncertain factors. Race and IQ is also a potentially hot button topic, and may be grossly misused. Of course, whites must also be involved in any research process, and their points of view also taken into account. [15]

There have been many black scientists such as Neil deGrasse Tyson, George Washington Carver, Alice Ball, Charles Henry Turner and others, and they have accomplished a great deal. Skin colour is determined by a pigment called melanin, and we have something called a Flynn effect. This represents a rise in standardized IQ scores over time due to nutritional and other factors. We also have concepts such as the Napoleon complex, and the comprehensive sociocultural persecution complex which we have proposed. People in developing countries must also lead research and follow robust and reliable methods to boot. This will naturally pre-empt any form of bias and prejudice, and researchers and scholars in the west must act as a counterweight to other forms of bias and unwarranted speculation too. Researchers must also study inferiority complex, the inferiority complex, the persecution complex, and its impact on a diverse set of individuals. The sociological ninety ten rules and hierarchical analysis may also be used to good and productive effect. The traditional term race such as those proposed by Francois Bernier, John Ray, Johann Friedrich Blumenvbach, and Bernhard Varen, is now considered to be largely obsolete; this has been accelerated with the arrival of modern genetics.

Researchers now prefer terms such as ethno-biological identity which is dynamic rather than static given that there is always miscegenation involved. The traditional interpretation of races has now also been criticized by the American Association of Biological Anthropologists, and the American Anthropological Association. The world must more away from outdated concepts, quickly and fast. IQ tests are also criticized because of its potential for misuse and potential association with racism. In addition to all the above, IQ tests may not

[14] Quashing racism: Presenting the 'Comprehensive sociocultural persecution complex' as a logical extension and a practical application of the Certainty uncertainty principle for the social sciences Sujay Rao Mandavilli IJISRT, September 2023

[15] Mooting the concept of "Hierarchical analysis" in the context of a cultural taxonomy: A concept with widespread implications for social sciences research Sujay Rao Mandavill IJISRT, July 2024

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consider other aspects such as motivation, emotion, attitudes, mind-orientation, cultural-orientation, and other similar factors that may have a strong impact on an individual's eventual success in life. There are also many different types of IQ tests such as the Cognitive Abilities test, the Otis-Gamma test, the Naglieri non-verbal ability test, the Otis Lennon school abilities test, the differential ability scales test, the Naglieri non-verbal ability test, differential ability scales, and the Stanford Binet test.

- *Other Examples*

India also had a green revolution in the 1960's. The Green Revolution in India, was chiefly led by Swaminathan with inputs from Norman Borlaug, and led to impressive increases in crop yields. This was accomplished by introducing new and high-yielding varieties of both wheat and rice, accompanied by more modern farming techniques such as the use of chemical fertilizers, chemical pesticides, tractors and farm equipment and machinery, and improved irrigation techniques. It spite of its successes, it did produce negative environmental and social consequences, some of which are being felt even today. Many areas and regions are now moving towards organic farming – Sri Lanka messed it all up with an attempted sudden shift or transition, while Sikkim's efforts were rather more successful. Himachal Pradesh is now following in Sikkim's footsteps with some success. Of late, more modern agricultural techniques have been developed such as drip irrigation, vertical farming, intercropping, permaculture and regenerative agriculture. Drones and artificial intelligence are also being increasingly used in agriculture. While India has undoubtedly and unquestionably transitioned from subsistence agriculture to commercial agriculture, we direly need a second green revolution, and one that is primarily driven by the adoption of new technology. Vandana Shiva (an environmental activist) and other activists have also called out against Monsanto (subsequently acquired by Bayer), Dow, DuPont, and other companies, and against what she calls the poison cartel. Therefore, while more research is required – research particularly in areas such as regenerative faming and permaculture must be driven by cross-cultural teams. The right choice of participants is important, and participants must not only be technologically-savvy, but must possess a knowhow of scientific method. People from developing countries must also rise up to the occasion, and be familiar with science and how it works. For this to happen, educational systems may themselves need to improve, and the science of pedagogy may need to be recast as well. We have been writing about this for several years now.

II. CONCLUSION

The objective of this paper was to emphasize the need for reliable and bullet-proof research designs. We suitably began this paper by discussing what a research design was, tracing its history, and discussing the types of research design as well. We then emphasized the need for 360 degree approaches to research design, and also traced it to our previously published COMPASS model. We also differentiated between a hypothesis and a research design in order to bring out the importance of research design in scientific studies. We then emphasized the need for stakeholder-driven approaches in this paper, along with interdisciplinary and transdisciplinary approaches. The need for cross-cultural approaches to research, and cross-cultural research design were also stressed along with dialectical approaches. We also discussed previously-published, but less than ideal studies such as fertility and IQ studies, national IQ studies, race and IQ studies, and some other examples to add substance to our paper. We hope, anticipate and expect that the present paper will become a vital one in twenty-first century research studies, as it can go a long way in ensuring a robust and inclusive research design.