Volume 6, Issue 09, September 2021 ISSN (online): 2456-0006
International Journal of Science Technology Management and Research
Available online at: www.ijstmr.com

Provisional Formulation Explore Different Factors for Research in a Proper Direction

Sajjan Verma
M Tech 4th Semester
Computer Science and Engineering Department
Lord Krishna College of Technology
Indore M.P. India

Dr. Vijay Kumar Verma
Associate Professor
Computer Science and Engineering Department
Lord Krishna College of Technology
Indore M.P. India

Abstract: ***A hypothesis, which is a provisional formulation, plays significant role in empirical or socio-legal research. It not only navigates research in a proper direction but also contributes in testing or suggesting theories and describing a social or legal phenomenon. Role of hypothesis in navigating research: A hypothesis, regardless of its source, states what a researcher is looking for. It also suggests some plausible explanations about the probable relationships between the concepts or variables indicated therein. In fact, it navigates the research. Without it, no further step is possible in empirical research or non-doctrinal legal research. A hypothesis helps the researcher in drawing 'meaningful conclusions' supported by 'relevant' empirical data. A hypothesis also performs a descriptive function. Each time a hypothesis is tested empirically, it tells us something about the phenomenon it is associated with. If the hypothesis is empirically supported, then our information about the phenomenon increases. Even if the hypothesis is refuted, the test tells us something about the phenomenon we did not know before. In the proposed work we use hypothesis testing to explore different factors for***

Keywords: Provisional, Formulation, Factors

I. INTRODUCTION

.

A hypothesis, when empirically proved, helps us in testing an existing theory. A theory is not a mere speculation, but it is built upon facts. It is a set of inter-related propositions or statements organized into a deductive system that offers an explanation of some phenomenon. Facts constitute a theory when they are assembled, ordered and seen in a relationship. Therefore, when a hypothesis is 'tested', it not only supports the existing theory that accounts for description of some social phenomenon but also in a way 'tests' it. Suggest new theories: A hypothesis, even though related to some existing theory, may, after tested, A hypothesis or a set of hypotheses may originate from a variety of sources. The source of hypothesis, however, has an important bearing on the nature of contribution in the existing body of knowledge. A few prominent sources of hypothesis are discussed here below. Hunch or intuition: A hypothesis may be based simply on hunch or intuition of a person. It is a sort of virgin idea. Such a hypothesis, if tested, may ultimately make an important contribution to the existing science or body of knowledge. However, when a hypothesis is tested in only one study, it suffers from two limitations. First, there is no assurance that the relationship established between the two variables incorporated in the hypothesis will be found in other studies. Secondly, the findings of such a hypothesis are likely to be unrelated to, or unconnected with other theories or body of science. They are likely to remain isolated bits of information. Nevertheless, these findings may raise interesting questions of worth pursuing. They may stimulate further research, and if substantiated, may integrate into an explanatory theory. Findings of other: A hypothesis may originate from findings of other study or studies. A hypothesis that rests on the findings of other studies is obviously free from the first limitation, i.e. there is no assurance that it may relate with other studies. If such a hypothesis is proved, it confirms findings of the earlier studies though it replicates earlier study conducted in different concrete conditions.

FORMULATE A RESEARCH HYPOTHESIS.

Before researchers can begin working on a question that interests them, they need to formulate a research hypothesis. This is an important step in the scientific method because this determines the direction of the study. Scientists need to scrutinize previous work in the area and select an experimental design to use that helps them find data that either supports or rejects their hypothesis. Research hypotheses are of different types: simple, complex, directional, non-directional, associative, causal, inductive & deductive, null, and alternative or research.

Simple Hypothesis: This predicts the relationship between a single independent variable and a single dependent variable (DV). For example: Lower levels of exercise postpartum will be associated with greater weight retention (DV).

Complex Hypothesis: This predicts the relationship between two or more independent variables and two or more dependent variables. Example of a complex multiple independent variable hypothesis - low risk pregnant women who value health highly believe that engaging in health promoting behaviours will result in positive outcomes;perceive fewer barriers to health promoting activities; are more likely than other women to attend pregnancy-related education programs (DV).

Directional Hypothesis: This may imply that the researcher is intellectually committed to a particular outcome. They specify the expected direction of the relationship between variables i.e.journal articles generally use this form of hypothesis. The investigator bases this hypothesis on the trends apparent from previous research on this topic. Considering the example, a researcher may state the hypothesis as, 'High school students who participate in extracurricular activities have a lower GPA than those who do not participate in such activities.' Such hypotheses provide a definite direction to the prediction.

Non directional Hypothesis: This form of hypothesis is used in studies where there is no sufficient past research on which to base a prediction. Do not stipulate the direction of the relationship. Continuing with the same example, a non-directional hypothesis would read, The academic performance of high school students is related to their participation in extracurricular activities.

Associative Hypothesis: Associative hypotheses propose relationships between variables, when one variable changes, the other changes. Do not indicate cause and effect.

II. LITERATURE SURVEY

In 2012 Ruud WETZELS, Raoul P. P. P "A Default Bayesian Hypothesis Test for ANOVA Designs" This article presents a Bayesian hypothesis test for analysis of variance (ANOVA) designs. The test is an application of standard Bayesian methods for variable selection in regression models. We illustrate the effect of various g-priors on the ANOVA hypothesis test. The Bayesian test for ANOVA designs is useful for empirical researchers and for students; both groups will get a more acute appreciation of Bayesian inference when they can apply it to practical statistical problems such as ANOVA. We illustrate the use of the test with two examples, and we provide R code that makes the test easy to use[1].

In 2013 Joginder Kaur " Techniques Used in Hypothesis Testing in Research Methodology – A Review" This paper reviews the methods to select correct statistical tests for research projects or other investigations. Research is a scientific search on a particular topic including various steps in which formulating and testing of hypothesis is an important step. To test a hypothesis there are various tests like Student's t-test, F test, Chi square test, ANOVA etc. and the conditions and methods to apply these tests are explained here. Only the correct use of these tests gives valid results about hypothesis testing[2].

In 2014 Jeremy Orloff and Jonathan Bloom "Frequentist statistics is often applied in the frame work of null hypothesis significance testing(NHST).We will look at the Neyman- Pearson paradigm which focuses none hypothesis called the null hypothesis. There are other paradigms for hypothesis testing, but Neyman-Pearson is the most common. Stated simply, this method asks if the data is well outside the region where we would expect to see it under the null hypothesis. then we reject the null hypothesis in favor of a second hypothesis called the alternative hypothesis the evidence of the data will be consider ed purely through the likelihood function it will not be weighted by our prior belief. We will need a notion of extreme data, 95out of 100 heads in a coin toss or a May fly that lives for a month[3].

In 2015 Valentina Cipriani, "Ophthalmic statistics note 7: multiple hypothesis testing—to adjust or not to adjust" The primary objective of this study was to determine whether bevacizumab was superior to standard NHS care and this single test of significance provided strong evidence. Closer inspection of the study reveals however that a variety of different treatments were used within the NHS standard care arm and it was natural that investigators would wish to establish evidence of efficacy between bevacizumab and each of these alternative treatment modalities. Similarly, while the study had revealed evidence of a treatment effect on visual acuity, investigators were interested also to examine efficacy on other measures of visual function such as contrast sensitivity.3 Clinical trials can be expensive and it would seem very wasteful and indeed perhaps unethical not to explore the data further. However, a single question at the outset has led to many questions of interest and many tests of significance being proposed [4].

In 2016 Ayotunde Ola Kolawole Hypotheses And Hypothesis Testing A hypothesis testing is the pillar of true research findings. This write-up substantiates the role of a hypothesis, steps in hypothesis testing and its application in the course of a research exercise. The world that we are living is full of uncertainties. Scientifically, we can't have 100 percent confidence on assumption especially in the context of a social science research field. Human reasoning is complex and can be complicated; this is why we have to rule out chances or assumption as a plausible explanation for the results from a research study. In this vein, Statisticians have devised a means of drawing inferences from research findings through hypothesis testing. Further light is being shed on decision errors and rules of interpreting hypothesis test result. Procedures of hypothesis test in regression analysis, t-test and chi-square goodness of fit test were also expatiated. Statistical software like SPSS, STATA, JMP etc. have eased us the stress of all the rigorous calculations stated in this text. The manual step is to justify that results from these software are not magic. In the case of large data, the manual method is not efficient. This will later bring us to the next line of action; that is, practical analysis of data using a statistical software[5].

In 2017 Jinyuan Chang, Chao Zheng Simulation-Based Hypothesis Testing of High Dimensional Means Under Covariance Heterogeneity In this article, we study the problem of testing the mean vectors of high dimensional data in both one-sample and two-sample cases. The proposed testing procedures employ maximum-type statistics and the parametric bootstrap techniques to compute the critical values. Different from the existing tests that heavily rely on the structural conditions on the unknown covariance matrices, the proposed tests

allow general covariance structures of the data and therefore enjoy wide scope of applicability in practice. To enhance powers of the tests against sparse alternatives, we further propose two-step procedures with a preliminary feature screening step. Theoretical properties of the proposed tests are investigated. Through extensive numerical experiments on synthetic data sets and an human acute lymphoblastic leukemia gene expression data set, we illustrate the performance of the new tests and how they may provide assistance on detecting disease-associated gene-sets. The proposed methods have been implemented in an R-package HDtest and are available on CRAN[6].

In 2018 Sanjoy Datta Concept of Testing of Hypothesis The major purpose of hypothesis testing is to choose between two competing hypotheses about the value of a population parameter. For example, one hypothesis might claim that the wages of men and women are equal, while the alternative might claim that men make more than women. B. The hypothesis actually to be tested is usually given the symbol H0, and is commonly referred to as the null hypothesis. It is the hypothesis of no difference. It can be defined as the hypothesis which is under our consideration and may have possible chances of rejection under the assumptions which are true. It is a statistical hypothesis that states that there is no difference between a parameter and a specific value, or that there is no difference between two parameters. C. The other hypothesis, which is assumed to be true when the null hypothesis is false, is referred to as the alternative hypothesis, and is often symbolized by HA or H1. It is a statistical hypothesis that states the existence of a difference between a parameter and a specific value, or states that there is a difference between two parameters[7].

In 2019 Bradley E. Alger " Hypothesis-Testing Improves the Predicted Reliability of Neuroscience Research" Critics often cite statistical problems as prime contributors to the "reproducibility crisis" of science, expressing great concern about research that bases major conclusions on single p-valued statistical tests. The critics also argue that the predicted reliability of neuroscience research in particular is low because much of the work depends heavily on small experimental sample sizes and, hence, its statistical tests lack adequate "power." It isn't known how common the practice of basing major conclusions on single tests is in neuroscience or how the statistical criticisms affect the validity of conclusions drawn by laboratory research that evaluates hypotheses via multiple tests. I review a sample of neuroscience publications to estimate the prevalence and extensiveness of hypothesis-testing research. I then apply R.A. Fisher's method for combining test results to show that the practice of testing multiple predictions of hypotheses increases the predicted reliability of neuroscience research[8].

In 2020 Dan-Yu Lin et al proposed **"Evaluating the Efficacy of COVID-19 Vaccines".** They demonstrate the advantages of this strategy through realistic simulation studies. They showed how this approach can provide rigorous interim monitoring of the trials and efficient assessment of the durability of vaccine efficacy. They presented a simple and rigorous framework to consider the totality of evidence when evaluating the benefit of a COVID-19 vaccine in reducing SARS-CoV-2 infection, COVID- 19, and severe COVID-19. The proposed methods are more robust to different scenarios of vaccine efficacy than the use of a single primary endpoint. They recommend using the combined test to provide an overall assessment of worthwhile vaccine efficacy, then using the sequential test to determine the endpoints against which the vaccine is efficacious [12].

III. PRPOSED APPROACH

Statisticians follow a formal process to determine whether to reject a null hypothesis, based on sample data. This process, called hypothesis testing, consists of four steps .

a. State the hypotheses: This involves stating the null and alternative hypotheses. The hypotheses are stated in such a way that they are mutually exclusive. That is, if one is true, the other must be false.
b. Formulate an analysis plan: The analysis plan describes how to use sample data to evaluate the null hypothesis. The evaluation often focuses around a single test statistic.
c. Analyze sample data: Find the value of the test statistic (mean score, proportion, t statistic, z-score, etc.) described in the analysis plan.
d. Interpret results: Apply the decision rule described in the analysis plan. If the value of the test statistic is unlikely, based on the null hypothesis, reject the null hypothesis.

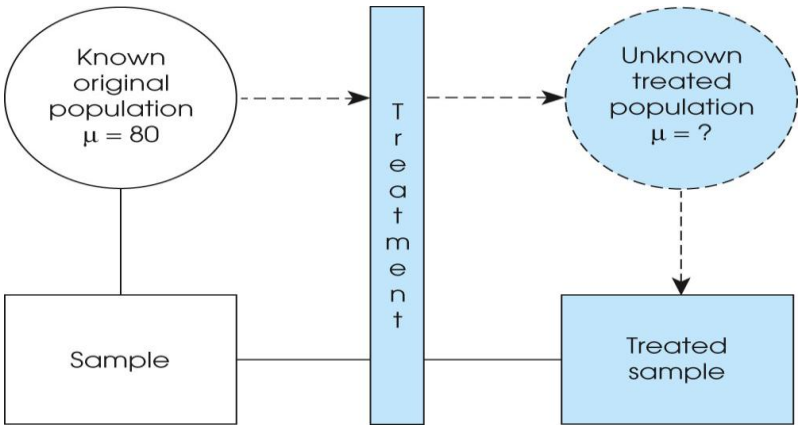

Figure1 sample size and treated sample size

The purpose of the hypothesis test is to decide between two explanations:
i. The difference between the sample and the population can be explained by sampling error (there does not appear to be a treatment effect)
ii. The difference between the sample and the population is too large to be explained by sampling error (there does appear to be a treatment effect).

CONCLUSION

This test is applied when we have one categorical variable from a single population. It is used to determine whether sample data are consistent with a hypothesized distribution. form the proposed work we can say that the chi-square goodness of fit test is appropriate when the following conditions are met, the sampling method is simple random sampling, the variable under study is categorical or qualitative, the expected value of the number of sample observations in each level of the variable is at least 5.
This approach consists of four steps: (1) state the hypotheses, (2) formulate an analysis plan, (3) analyze sample data, and (4) interpret results

REFERENCE

1. Ruud WETZELS, Raoul "A Default Bayesian Hypothesis Test for ANOVA Designs" Downloaded by [UVA Universiteitsbibliotheek SZ] at 03:17 06 November 2012.
2. Joginder Kaur "Techniques Used in Hypothesis Testing in Research Methodology – A Review" International Journal of Science and Research (IJSR) ISSN (Online): 2319-7064 Index Copernicus Value (2013): 6.14 | Impact Factor (2013): 4.438.
3. Jeremy Orloff and Jonathan Bloom Null Hypothesis Significance Testing 18.05class17,Null Hypothesis Significance Testing I, Spring 2014.
4. Valentina Cipriani, Ana Quartilho Ophthalmic statistics note 7: multiple hypotheses testing—to adjust or not to adjust Cipriani V, et al. Br J Ophthalmol September 2015 Vol 99 No 9.
5. Ayotunde O. Hypotheses And Hypothesis Testing Ekiti State University, Ado Ekiti Faculty of Agricultural Sciences Department of Agricultural Economics and Extension.
6. Jinyuan Chang, Chao Zheng Simulation-Based Hypothesis Testing of High Dimensional Means Under Covariance Heterogeneity Biometrics 73, 1300–1310 DOI: 10.1111/biom.12695 December 2017.
7. Sanjoy Datta Concept of Testing of Hypothesis West Bengal University of Animal and Fishery Sciences Preprint · September 2018 DOI: 10.13140/RG.2.2.35911.34721.
8. Bradley E. Alger Hypothesis-Testing Improves the Predicted Reliability of Neuroscience Research this version posted February 4, 2019 ; doi: https://doi.org/10.1101/537365 bioRxiv preprint.
9. Dan-Yu Lin, Donglin Zeng Evaluating the Efficacy of COVID-19 Vaccines medRxiv preprint doi: https://doi.org/10.1101/2020.10.02.20205906; this version posted October 5, 2020.
10. Ghaith Habboub The embedded biases in hypothesis testing and machine learning Department of Neurosurgery, Cleveland Clinic, Cleveland; Neurosurg Focus Volume 48 May 2020