

Meta-Analysis in Summarizing Research Results

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Introduction

Research involves the creation of novel knowledge, while meta-research entails the consolidation of a vast body of existing scientific knowledge to enhance the practical application of scientific principles and their effects. Social science encompasses academic disciplines focused on studying society and the interactions among individuals within it. Agricultural extension is a fundamental field within social science. Social science research primarily addresses societal issues, offering insights into how society perceives science and innovation and how these impact people's lives. Meta-analysis is a statistical technique used to combine the results of multiple scientific studies, enabling the creation of easily interpretable aggregate measures. Meta-analysis also aids governments in formulating and implementing policies to achieve specific objectives. One significant challenge in social science is policy formulation, which cannot rely solely on the findings of individual studies due to their limited scope. Thus, meta-analysis is a valuable tool for advancing society by improving the implementation of programs and projects.

The results of meta-analysis are a reliable source of evidence that enhances the precision of effect estimates, addresses questions not addressed by individual studies, resolves controversies stemming from apparently conflicting studies, and more. Since extension education is an applied social science focused on disseminating programs to grassroots levels, meta-analysis takes it a step further to enhance progress positively.

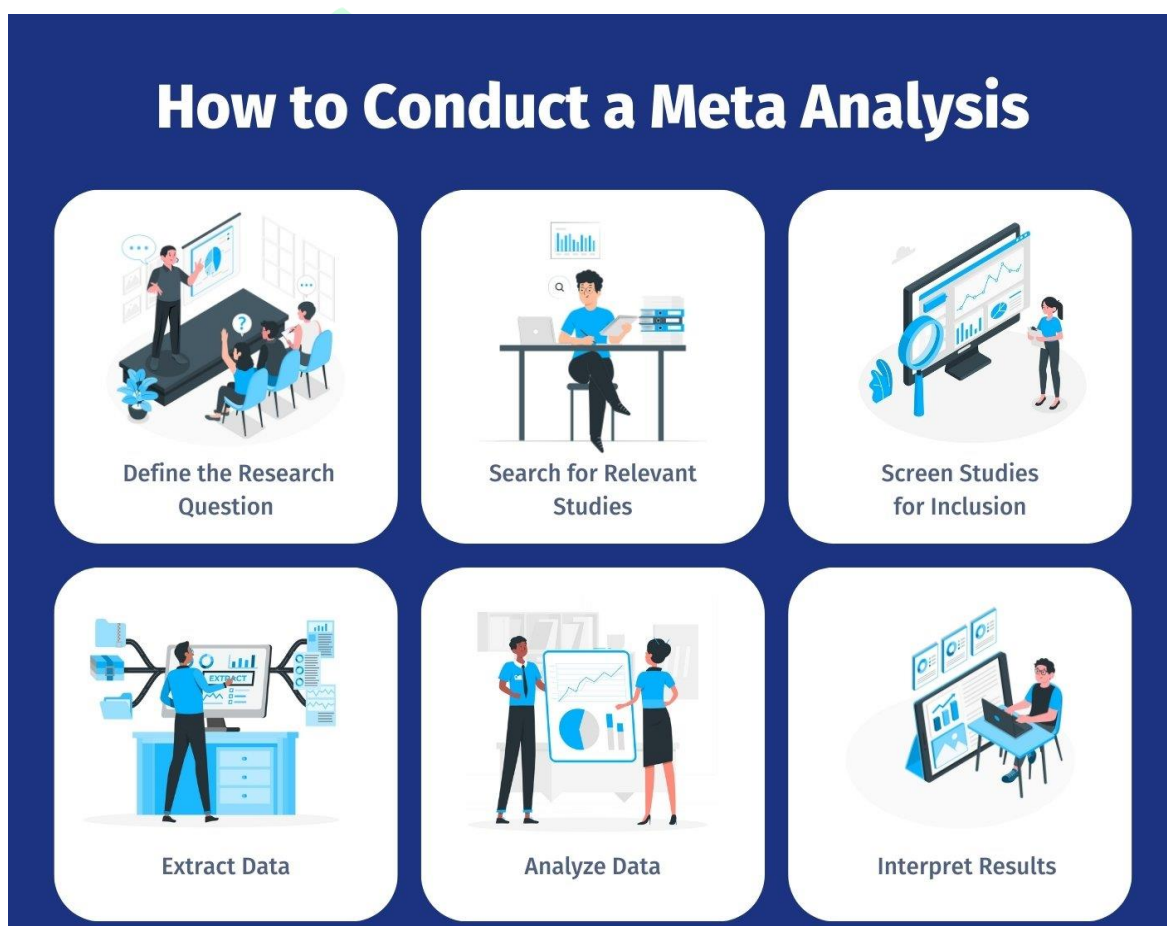
Concept of Meta-Analysis

Meta Analysis was first put forth by Gene Glass in 1976 and defined as “a statistical synthesis method that provides the opportunity to view the whole picture in a research context by combing and analyzing the quantitative results of many empirical studies”. A Meta-Analysis is a valid, objective, statistical and scientific method of analyzing and combining different results. It

is also known as overview synthesis, summarizing analysis, quantitative synthesis and so on and so forth.

Objectives of Meta-Analysis

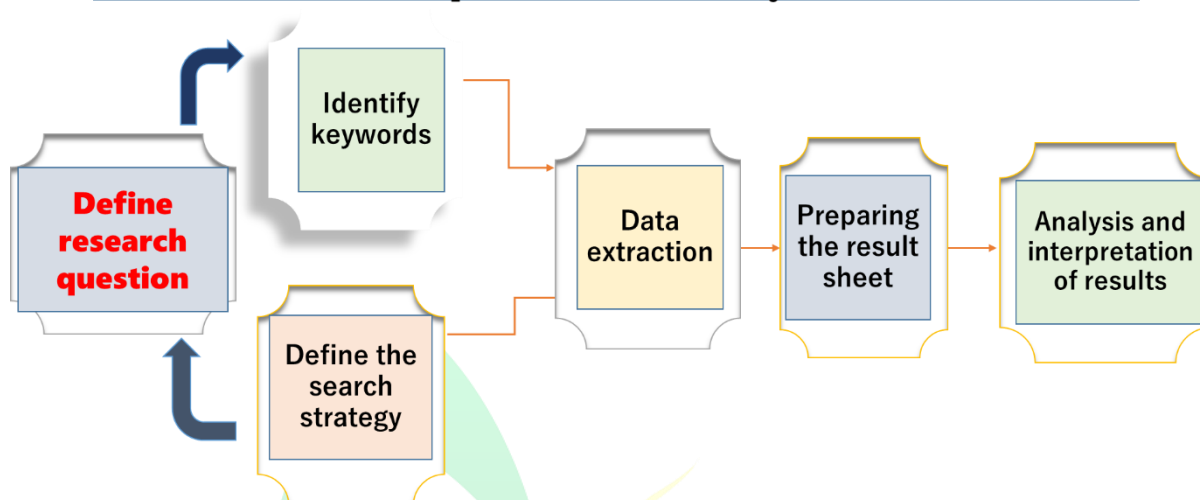
The main objectives of meta-analysis include consolidating and summarizing findings from various individual studies, scrutinizing variations in results across studies, enhancing the accuracy of effect estimation, investigating and delving deeper into a particular matter, recognizing gaps in the available evidence, and formulating new hypotheses for future research.



Why Meta analysis is important??

- Derive the pooled estimate
- Improves the precision of estimates of effect
- Generate new hypothesis
- Try to settle the controversies from apparently conflicting studies
- Answers the questions not posed by individual studies and gives the summary effect

Steps in meta analysis



Advantages of Meta-Analysis:

- Meta-Analysis helps to combine studies with small samples and aggregating them gives higher statistical power to the combined results.
- External validity: the results can be generalized to a larger population and can be used in policy formulation and inconsistency of results across studies can be quantified and analyzed
- Hypothesis testing can be employed on summary estimates.
- Enhanced precision and accuracy of estimates result from using more data.
- Moderators can be introduced to elucidate variations between studies.
- The presence of publication bias can be explored.

Limitations of Meta-Analysis:

- Excessive focus on individual effects can hinder the ability to draw valid conclusions due to publication bias.
- Neglects qualitative disparities and the quality of studies.
- Overemphasis on individual effects can be problematic.
- Simpson's paradox, often referred to as the "apples and oranges criticism."
- Challenges in drawing valid conclusions due to publication bias.
- Subjective in coding the effect size.
- Dependence on the availability of statistical software for meta-analysis.
- Fails to account for qualitative distinctions and the quality of studies.



- Limited coverage and the potential for improper blending of studies.

Conclusion:

In order to take the social science research to a long way in terms of its validity and utility, Meta-Analysis would play a pivotal role in achieving it. With due diligence it can solve insurmountable scientific and social problems and also try to attain extra mile to ace the progress on the bright side. Meta-Analysis is a useful tool in social science research to summarize the results of several studies, which increases the statistical power of the estimate. The gap in research supporting evidence-based policy can be rectified by employing Meta-Analysis while giving thoughtful attention to developmental concerns. The awareness and discerning observations of researchers can assist social science research in furnishing statistical proof that policymakers can use to undertake corrective measures for more effective policy implementation in society

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