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Statistical Hypothesis Testing in Scientific Research: The Role of Correlation Coefficients in Enhancing the Quality of Media and Communication Studies.

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Abstract

This study investigates the role of correlation coefficients in statistical hypothesis testing and their contribution to improving the quality of scientific research in media and communication studies. It focuses on the methodological conditions required for the correct application of Pearson and Spearman correlation coefficients, particularly in relation to data type, distribution, and measurement level. The research highlights common errors in selecting and interpreting correlation methods, which may affect the validity of scientific results.

It also emphasizes the importance of choosing appropriate statistical tools to ensure accurate analysis of relationships between variables. The findings show that correct use of correlation analysis enhances the reliability and objectivity of research outcomes. In addition, the study underlines that correlation does not imply causation, requiring careful theoretical interpretation. Overall, the study contributes to improving methodological rigor in quantitative media research and strengthening the quality of academic publications.

Keywords: *Correlation coefficients; Hypothesis testing; Media research; Methodology; Statistical analysis*

I. INTRODUCTION

The use of statistical methods in media and communication research has become essential for testing hypotheses and examining relationships between variables in a scientific and objective manner. Among these methods, correlation coefficients are widely used to measure the strength and direction of relationships, particularly in quantitative studies. However, the validity of their application depends on strict methodological conditions that are not always properly observed in academic research.

Despite their importance, many studies still face methodological limitations related to the incorrect selection and interpretation of correlation coefficients, especially the confusion between Pearson and Spearman methods, as well as the neglect of statistical assumptions such as data type, distribution normality, and measurement level. These issues may lead to inaccurate results and weaken the scientific credibility of research outputs.

Accordingly, the problematic of this study is formulated as follows:

How can correlation coefficients be properly applied within statistical hypothesis testing in order to enhance the accuracy, validity, and overall quality of scientific research in media and communication studies?

This main question gives rise to the following sub-questions:

- What are the theoretical and methodological foundations of statistical hypothesis testing in scientific research ?
- What are the required conditions for selecting appropriate correlation coefficients ?
- What are the main differences between Pearson and Spearman correlation coefficients in terms of assumptions, application, and interpretation ?
- How do data type and statistical distribution influence the choice of correlation method ?
- To what extent do correlation coefficients contribute to improving the accuracy and objectivity of scientific results ?
- What are the most common methodological errors in the application of correlation analysis in scientific research?

1. Scientific Hypothesis Concept

1.1. Linguistic Definition

The hypothesis is considered one of the fundamental concepts in scientific research methodology, as it represents a preliminary assumption or a tentative explanation formulated by the researcher to address the research problem in preparation for empirical testing and verification.

The term *Hypothesis* originates from the Greek roots *Hypo*, meaning “under” or “less,” and *Thesis*, meaning “proposition” or “statement.” Accordingly, a hypothesis reflects a lower degree of certainty than established scientific facts because it remains subject to testing, validation, modification, or rejection according to research findings. (Badr, 1992)

1.2. Conceptual Definition

Researchers have provided several definitions of the scientific hypothesis. Among the most significant are the following:

Mohammed Obaidat, Mohammed Abu Nasar, and Aqla Mubaideen define the hypothesis as:“A set of proposed assumptions or explanations for a research problem expressing a possible relationship between an independent variable and a dependent variable in a testable form.” (Obeidat et al., 1999)

Ahmed Badr defines it as:“A tentative conclusion proposed by the researcher to explain observed facts and phenomena and to guide the research process.” (Badr, 1992)

Hamad Abdul Ghani Saudi and Mohsen Ahmed Al-Khudairi define it as: “A formulation of probabilistic assumptions that explain the causes and dimensions of a problem and provide proposed solutions for reducing its effects in light of interacting variables.” (Al-Eisawy & Al-Eisawy, 1992)

Amer Qandilji defines it as:“An intelligent and provisional inference formulated by the researcher as a preliminary explanation of the research problem.” (Qandilji, 1999)

1.3. Components of the Scientific Hypothesis

A scientific hypothesis generally consists of two principal variables:

• Independent Variable

The independent variable refers to the factor assumed to influence or explain the phenomenon under investigation. It is manipulated or examined by the researcher in order to determine its impact.

• Dependent Variable

The dependent variable represents the outcome or response affected by the independent variable. It reflects the observable effect resulting from the relationship under study.

It should be noted that the nature of variables is not fixed, as a variable may function as an independent variable in one study and as a dependent variable in another according to the objectives, design, and methodological orientation of the research.

In methodological literature, these variables may also be referred to as:

- **Manipulated Variable:** the variable controlled by the researcher.
- **Measured Variable:** the variable observed and measured by the researcher. (Warda, 2021)

Table 01. Components of Scientific Hypotheses

Variable Type	Definition	Function in Research	Example in Media Studies
Independent Variable	Factor assumed to influence the phenomenon	Explains or affects another variable	Type of media content
Dependent Variable	Variable affected by the independent variable	Measures the outcome	Level of audience engagement

Source: Prepared by the researcher (2026), based on scientific literature in research methodology and statistical analysis.

1.4. Types of Hypotheses in Scientific Research

Scientific hypotheses vary according to the number of variables and the nature of relationships among them.

a. Single-Variable Hypothesis (Descriptive)

This type focuses on describing a single phenomenon or variable.

Example: Increasing use of social media among university students.

b. Two-Variable Hypothesis (Relational)

This hypothesis examines the relationship between two variables.

Example: There is a relationship between media exposure and political awareness among youth.

c. Multi-Variable Hypothesis (Complex Explanatory)

This type includes several independent variables affecting a single dependent variable. (Angers, n.d.)

Example: Media exposure, educational level, and social affiliation influence political attitudes among youth.

1.5. Statistical Forms of Hypothesis Testing

In scientific research, hypotheses are commonly formulated in statistical forms to facilitate empirical testing and objective interpretation of research findings.

a. Alternative Hypothesis *(H1):*The alternative hypothesis assumes the existence of a statistically significant relationship between variables and seeks to verify it empirically.

Example: Audience attitudes toward a product differ according to exposure to advertisements.

b. Null Hypothesis *(H0):* The null hypothesis assumes the absence of a statistically significant relationship between variables and serves as the basis for statistical testing. (Obeidat et al., 1999) **Example:** There are no statistically significant differences in audience attitudes toward a product based on advertisement exposure.

1.6. Conditions for Formulating Scientific Hypotheses

The formulation of scientific hypotheses requires adherence to a number of methodological and logical conditions to ensure validity, precision, and research applicability.

A well-formulated scientific hypothesis should satisfy several methodological conditions, including:

- Clarity and precision in defining variables.
- Reliance on theoretical and empirical foundations.
- Testability and measurability.
- Objectivity and neutrality.
- Internal consistency without contradiction.
- Possibility of proposing alternative hypotheses.
- Avoidance of researcher bias before data collection.
- Precise specification of relationships among variables.
- Practical feasibility of testing.
- Logical consistency with scientific principles.
- Limiting the number of hypotheses to avoid dispersion. (Warda, 2021)

1.7. Characteristics of a Good Hypothesis

A good scientific hypothesis is characterized by the following:

- It expresses a probabilistic and testable relationship.
- It is grounded in scientific knowledge and prior experience.
- It contributes to explaining the phenomenon under study.
- It facilitates systematic understanding of the research problem.

1.8. Sources of Scientific Hypotheses

Scientific hypotheses may be derived from several major sources, including:

- The researcher's personal knowledge and intellectual experience.
- Field observation and practical experience.
- Previous studies and scientific literature. (Alian & Ghunaim, 2000)
- Established scientific theories.
- The surrounding social and cultural environment.
- Academic specialization and disciplinary background.

2. Statistical Hypothesis Testing in Media and Communication Research

2.1. Concept of Statistical Analysis

Statistical analysis represents one of the essential methodological foundations in scientific research, particularly in media and communication studies, where researchers rely on data interpretation to explain communication phenomena and audience behavior scientifically and objectively.

Statistical analysis is defined as a systematic scientific process through which researchers collect, organize, classify, and analyze data in order to derive meaningful scientific information that contributes to explaining the studied phenomenon and supporting scientific research. It is also considered a methodological procedure that enables researchers to study a specific population through identifying its characteristics and distinctive features by relying on representative samples analyzed according to precise scientific standards, thereby allowing the generalization of results with a degree of accuracy and objectivity.

The importance of statistical analysis lies in its capacity to help researchers obtain accurate and reliable findings. Furthermore, it facilitates the management of large quantities of data collected by institutions and organizations and transforms them into meaningful information suitable for scientific interpretation and analysis. (Amani, 2007)

2.1.1. Descriptive and Inferential Statistics and Their Relationship to Hypothesis Testing

Statistical analysis in scientific research is generally divided into two complementary branches: descriptive statistics and inferential statistics. Together, they constitute the methodological basis for statistical analysis and hypothesis testing in scientific studies.

Descriptive statistics aim to describe, organize, and summarize data within the sample or statistical population through the use of measures of central tendency such as the arithmetic mean, median, and mode, in addition to measures of dispersion that indicate the variability of data. This branch is limited to presenting the characteristics of the collected data without extending conclusions beyond the studied sample.

Inferential statistics, on the other hand, go beyond description toward analysis and generalization. They rely on representative samples drawn from the statistical population in order to derive conclusions that can be generalized to the entire population. (Ali & Bhaskar, 2016)Inferential statistics therefore constitute the scientific basis for testing statistical hypotheses and interpreting relationships between variables in media and communication research.

In this context, hypothesis-testing methods are employed to verify the validity of the scientific hypotheses proposed in the research by comparing the observed results with statistically expected values. This process relies on a variety of statistical tests selected according to the nature of the data and the conditions governing their application.

These statistical tests are generally classified into two major categories:

- **Parametric Tests**, such as the *T-Test* and *Analysis of Variance (ANOVA)*, which are used when the assumptions of normal distribution and homogeneity of variance are satisfied.
- **Non-Parametric Tests**, such as the *Chi-Square Test*, *Mann–Whitney Test*, and *Kruskal–Wallis Test*, which are employed when statistical assumptions are not fulfilled or when dealing with qualitative data.

Accordingly, the relationship between descriptive statistics, inferential statistics, and hypothesis testing is complementary in nature. Descriptive statistics provide a preliminary description and organization of data, whereas inferential statistics and hypothesis-testing procedures enable researchers to analyze data scientifically and derive findings that may be generalized to the broader statistical population.

2.2. Parametric and Non-Parametric Statistical Tests

Parametric and non-parametric statistical tests constitute essential inferential procedures in media and communication research. Their selection depends mainly on the nature of the data, sample characteristics, and the statistical assumptions associated with the studied population.

2.2.1. Parametric Statistical Tests

Parametric statistical tests are statistical procedures that assume the existence of specific characteristics within the statistical population. These procedures rely on statistical estimators derived from the sample and are mainly based on measures such as the arithmetic mean and standard deviation.

The primary distinction between parametric and non-parametric approaches lies in the fact that parametric methods depend on quantitative statistical measures, whereas non-parametric methods do not require such assumptions.

From this perspective, statistics differentiates between several parametric tests, including the Independent Samples *T-Test*, Paired Samples *T-Test*, *Analysis of Variance (ANOVA)*, and *Z-Test*. These tests are based on assumptions related to the statistical population, particularly normal distribution and homogeneity of variance.

Accordingly, the parametric approach may be defined as a set of statistical methods that require the fulfillment of specific assumptions concerning the population from which the sample is drawn. This requires a precise distinction between the concepts of "population" and "sample," as each possesses distinct characteristics in statistical analysis.

2.2.2. Non-Parametric Statistical Tests

Non-parametric statistical tests represent alternative procedures used when the assumptions required for parametric tests are not satisfied or when dealing with qualitative variables such as nominal and ordinal data.

These tests are considered particularly suitable when the collected data are not normally distributed or when the sample size is relatively small. Commonly used non-parametric tests include the *Chi-Square Test*, *Mann–Whitney Test*, and *Kruskal–Wallis Test*.

Although the two approaches differ methodologically, both belong to inferential statistics and enable researchers to generalize findings to the statistical population. Nevertheless, the degree of confidence and accuracy varies according to the nature of the data and the statistical method employed. (Al-Najjar, 2015)

Table (02): Types of Statistical Tests

Main Type	Tests	Purpose	Data Type
Parametric Tests	Independent Samples T-Test	Comparing means of two independent groups	Quantitative data + normal distribution
	Paired Samples T-Test	Comparing means of the same group (before/after)	Quantitative data + normal distribution
	Z-Test	Testing differences in large samples	Quantitative data
	ANOVA (F-Test)	Comparing means of more than two groups	Quantitative data + homogeneity of variance
Non-Parametric Tests	Chi-Square Test	Testing relationships between categorical variables	Nominal data
	Mann–Whitney U Test	Comparing two independent groups	Ordinal or non-normal data
	Wilcoxon Signed-Rank Test	Comparing two related groups	Ordinal data
	Kruskal–Wallis Test	Comparing more than two groups	Ordinal or non-normal data

Source: Prepared by the researcher (2026), based on relevant statistical and methodological references.

2.3. Statistical Hypotheses

Statistical hypotheses are temporary scientific propositions related to the parameters of the statistical population under study, which are not precisely known to the researcher. They represent hypothetical solutions to the research problem and are tested using appropriate statistical methods based on sample data .

In media and communication research, statistical hypotheses are widely used in studying media effects, measuring audience attitudes, and analyzing the relationship between media exposure and behavior or opinions.

2.3.1. Types of Statistical Hypotheses

Statistical hypotheses are mainly divided into two types:

• Null Hypothesis (H_0)

The null hypothesis states that there is no statistically significant difference or relationship between the study variables or between a population parameter and a hypothesized value. It assumes that any observed variation in the data is due to chance rather than a real effect of the studied variables .

• Alternative Hypothesis (H_1)

The alternative hypothesis represents the researcher's proposed assumption, indicating the existence of a statistically significant relationship or difference between variables. It is accepted when the null hypothesis is rejected based on statistical test results derived from sample data.

2.3.2. Errors in Hypothesis Testing

When testing statistical hypotheses, researchers may encounter two types of errors:

a. Type I Error (α)

This occurs when the null hypothesis is rejected even though it is true in reality. It is also called the level of statistical significance, commonly set at 0.05 in social and media research.

b. Type II Error (β)

This occurs when the null hypothesis is accepted even though it is false in reality. It is related to statistical power; the higher the power of the test, the lower the probability of this error. (Younes & Mostafa, 2021)

2.3.3. Importance of Statistical Hypotheses in Media and Communication Research

Statistical hypotheses are essential in media and communication studies, as they contribute to:

- Transforming media phenomena into measurable variables
- Testing the effects of media on audiences in a scientific manner
- Identifying relationships between demographic variables and media behavior
- Supporting research findings with statistical evidence instead of subjective impressions
- Enhancing the objectivity and scientific accuracy of media studies

2.3.4. Methods of Statistical Hypothesis Testing

Hypothesis testing is a fundamental step in scientific research, particularly in media and communication studies, as it aims to verify research hypotheses and interpret relationships between variables in a systematic and precise manner .

A. Descriptive Analysis

Descriptive analysis is the first stage of data processing, aiming to provide an initial overview of sample characteristics and variable distribution. It includes:

- Frequency tables showing distribution of responses
- Percentages used for comparison between categories
- Measures of central tendency such as mean, median, and mode

This method is used in media research to understand audience characteristics such as exposure levels and usage patterns without analyzing causal relationships.

B. Qualitative Analysis

Qualitative analysis focuses on interpreting quantitative results and transforming them into meaningful conceptual insights linked to the theoretical framework of the study. It goes beyond numerical data to explain their meaning within the social and communication context.

In this stage, the researcher:

- Links statistical results to theoretical frameworks
- Interprets relationships between variables based on hypotheses
- Converts numerical data into explanatory meanings of the phenomenon

This analysis answers the question: *What do these results mean within the communication and social context?*

C. Inferential (Statistical) Analysis

Inferential analysis is the most important stage in hypothesis testing, as it relies on statistical methods that allow generalization from the sample to the population.

It includes:

- Measures of correlation between variables
- Statistical significance tests such as Chi-Square, T-Test, and ANOVA
- Determination of significance levels (0.05 or 0.01) for hypothesis decision-making

2.4. Level of Statistical Significance

When testing statistical hypotheses, accepting the null hypothesis does not indicate absolute certainty regarding its validity. Instead, it is accepted at a predetermined level of confidence (such as 95% or 99%), which reflects the degree of reliability in statistical decision-making. This is referred to as the confidence level, and it is directly associated with the probability of error in hypothesis testing.

The level of statistical significance, also known as the significance level (α), represents the probability of rejecting the null hypothesis when it is actually true in reality. This type of error is known as Type I Error.

2.4.1. Relationship between Confidence Level and Significance Level

If the confidence level = 95%

→ α = 5% (0.05)

If the confidence level = 99%

→ α = 1% (0.01)

This relationship shows that increasing the confidence level reduces the significance level and therefore reduces the probability of error in statistical decision-making.

2.4.2. Statistical Representation of the Significance Level

The significance level is represented as an area under the probability distribution curve. This area is known as the rejection region, which defines the range of values for which the null hypothesis is rejected if the test statistic falls within it.

The rejection region may take two forms:

• One-tailed test

In a one-tailed test, the rejection region is located on one side of the distribution curve (either right or left), depending on the direction of the hypothesis.

• Two-tailed test

In a two-tailed test, the significance level is divided equally between both sides of the distribution curve, with α/2 allocated to each tail. (Kafrouni, 2011)

3. Correlation Coefficients in Scientific Research and Their Role in Enhancing the Quality of Scientific Articles

3.1 Definition of Correlation Coefficients

3.1.1 Concept of Correlation

Correlation, in its general scientific meaning, refers to co-variation, i.e., the simultaneous change between two variables. In other words, the change in one phenomenon is associated with a change in another. This association may be positive (direct), where an increase in one variable is accompanied by an increase in the other, or negative (inverse), where an increase in one variable corresponds to a decrease in the other (Mufti, 2022).

3.2 Concept of Statistical Correlation

Statistical correlation is a fundamental concept in quantitative analysis used to identify the nature, direction, and strength of relationships between variables. It represents the degree of shared variation between two variables, with values ranging from -1 to +1, indicating positive, negative, or no linear relationship .

+1 → Perfect positive correlation

-1 → Perfect negative correlation

0 → No linear correlation

Correlation analysis contributes to improving scientific article quality by enabling hypothesis testing and verifying statistically significant relationships between variables, thus enhancing objectivity and reliability (Swinscow & Campbell, 1997). However, its application requires methodological conditions such as linearity and, in the case of Pearson correlation, normal distribution of data .

Table (03): Reading Guide for Correlation Coefficient Values

Correlation Coefficient (r)	Reading / Interpretation

+1.00	Perfect positive correlation
+0.70 to +0.99	Strong positive correlation
+0.30 to +0.69	Moderate positive correlation
+0.01 to +0.29	Weak positive correlation
0.00	No correlation
-0.01 to -0.29	Weak negative correlation
-0.30 to -0.69	Moderate negative correlation
-0.70 to -0.99	Strong negative correlation
-1.00	Perfect negative correlation

3.3. The Importance of Correlation Coefficients in Enhancing Scientific Article Quality

a. Supporting Scientific Accuracy in Relationship Analysis

Correlation coefficients allow researchers to determine both the direction (positive/negative) and strength of relationships between variables in a precise quantitative manner. This reduces subjective interpretation and increases methodological rigor.

For example, a correlation of 0.70 indicates a strong positive relationship, while -0.45 indicates a moderate negative relationship, providing a clear scientific basis for interpretation instead of descriptive assumptions.

b. Hypothesis Testing

Correlation is a key tool in testing research hypotheses, as it enables empirical verification of assumed relationships between variables.

For instance, if a hypothesis states:

"There is a statistically significant relationship between exposure to digital advertising and consumer purchasing behavior,"

and Pearson correlation yields $r = 0.58$ at $\alpha = 0.05$, the hypothesis is statistically supported, strengthening the scientific validity of the research.

c. Enhancing the Credibility of Results

Correlation coefficients improve the credibility of research findings by relying on numerical data rather than subjective interpretation. They also reduce bias and support reproducibility.

For example, a correlation of 0.78 between news credibility and audience trust provides strong empirical evidence supporting the conclusion.

d. Improving the Quality of Research Instruments

Correlation analysis is widely used to assess validity and reliability of research instruments such as questionnaires.

Examples include:

Cronbach's Alpha = 0.86 → high internal consistency

Test-retest Pearson = 0.80 → good stability over time

Spearman correlations → consistency of ordinal items

Split-half reliability = 0.85 → strong reliability

These indicators confirm measurement accuracy and improve research quality.

e. Guiding Scientific Interpretation of Results

Correlation helps researchers interpret results by identifying both strength and direction of relationships while preventing incorrect causal interpretations, since correlation does not imply causation.

For example, a correlation of 0.60 between social media exposure and anxiety does not confirm a direct causal relationship, as other variables may be involved.

f. Supporting Statistical Analysis Using SPSS

Statistical software such as SPSS facilitates correlation analysis by providing precise and structured outputs.

Example:

Pearson correlation = 0.65

Sig. (2-tailed) = 0.01

This indicates a statistically significant moderate positive relationship, improving analytical accuracy and efficiency.

3 .4 General Conditions for Using Correlation Coefficients

Correlation analysis is a fundamental statistical tool in scientific research, particularly in quantitative studies within media and communication. It is used to examine the existence, direction, and strength of relationships between variables. However, the validity of correlation results depends on several methodological conditions that must be carefully considered before applying any correlation coefficient.

a. Type of Data

The appropriate choice of correlation coefficient depends primarily on the nature of the variables under study. Quantitative data are typically analyzed using Pearson's correlation coefficient, as they involve numerical measurements that allow for precise statistical operations. In contrast, ordinal data are better suited for Spearman's correlation coefficient, as they are based on ranked categories rather than exact numerical values.

b. . Data Distribution

The distribution of data plays a critical role in selecting the appropriate correlation method. When data follow a normal (symmetrical) distribution, Pearson's correlation is generally applied due to its assumption of linearity and normality. However, when data are non-normally distributed or skewed, Spearman's correlation is preferred, as it does not require strict distributional assumptions and relies on rank-based analysis.

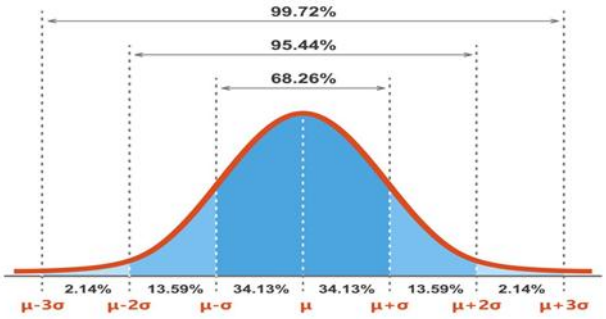


Figure (01): Normal distribution curve of data

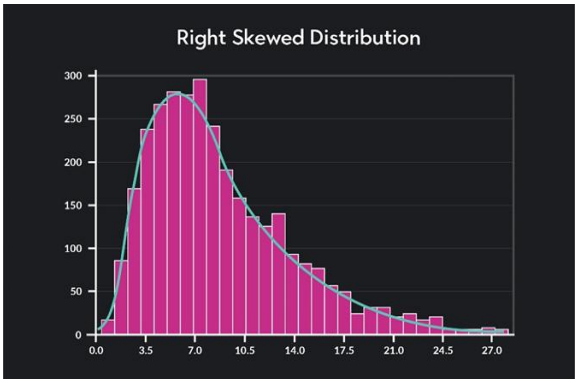


Figure (02): Positively skewed distribution

c. Homogeneity of Data

Statistical analysis requires a reasonable level of homogeneity between variables in terms of measurement scale and range of values. Significant disparities in units or magnitude may distort the interpretation of relationships and lead to biased results. In such cases, data standardization techniques (e.g., Z-scores) or the use of non-parametric methods such as Spearman's correlation are recommended to ensure methodological validity.

d. Distinction Between Correlation and Causation

A fundamental methodological principle in statistical analysis is that correlation does not imply causation. The existence of a statistical relationship between two variables does not

necessarily indicate a causal link, as the association may be influenced by external, intervening, or confounding variables. Therefore, researchers must interpret correlation results with caution and avoid drawing causal conclusions without sufficient theoretical or empirical justification.

4. Most Common Correlation Coefficients in Media and Communication Research

4.1 Pearson Correlation Coefficient

Definition

Pearson correlation measures the strength and direction of a linear relationship between two quantitative variables, ranging from -1 to +1.

Formula Concept

It is based on covariance divided by the product of standard deviations, producing a standardized measure of association.

Assumptions

- Quantitative data
- Linear relationship
- Normal distribution
- No outliers
- Homoscedasticity
- Independence of observations

Advantages

- Simple interpretation
- High statistical power
- Measures direction and strength
- Widely used in research
- Applicable in regression and advanced statistics

4.2 Spearman Correlation Coefficient

Definition

Spearman correlation is a non-parametric measure used for ordinal or non-normally distributed data, based on ranked values.

Characteristics

- Based on ranks
- Measures monotonic relationships
- No normal distribution required
- Resistant to outliers

Advantages

- Suitable for ordinal data (e.g., Likert scales)
- Simple and robust
- Works for non-linear monotonic relationships
- Less sensitive to extreme values

Correlation coefficients are essential statistical tools in scientific research, particularly in media and communication studies. They enhance analytical accuracy, support hypothesis testing, improve measurement quality, and strengthen the credibility of scientific findings. However, their validity depends on correct methodological application and proper interpretation, as misuse may lead to misleading scientific conclusions.

Table04 :Comparison Between Pearson and Spearman Correlation Coefficients (for Hypothesis Testing)

Criterion	Pearson Correlation Coefficient	Spearman Correlation Coefficient
Statistical Type	Parametric test	Non-parametric test
Data Type	Quantitative (interval / ratio)	Ordinal or ranked data
Purpose	Measures linear relationship between variables	Measures monotonic relationship between variables
Assumptions	Requires normal distribution and linearity	Does not require normal distribution
Data Basis	Uses raw numerical values	Uses ranked values (ranks)
Sensitivity to Outliers	Highly sensitive to extreme values	Less sensitive to outliers
Best Used When	Data are continuous and normally distributed	Data are ordinal or not normally distributed
Hypothesis Testing Role	Tests hypotheses about linear relationships between variables	Tests hypotheses about general association (rank-based relationship)
Example in Media Research	Relationship between hours of media exposure and audience engagement score	Relationship between audience satisfaction level (Likert scale) and platform preference ranking

Conclusion:

This study has highlighted the central role of correlation coefficients in statistical hypothesis testing within scientific research, particularly in media and communication studies. It has shown that the correct selection and application of correlation methods—especially Pearson and Spearman coefficients—depend on several methodological conditions, including the nature of data, distribution type, and measurement scale. Proper adherence to these conditions ensures more accurate, reliable, and scientifically valid results.

The analysis also confirmed that correlation analysis is not merely a technical procedure, but a critical interpretative tool that contributes to hypothesis validation, strengthens the objectivity of findings, and improves the overall quality of scientific articles. However, it does not establish causality, which requires careful theoretical interpretation and methodological caution.

Based on these findings, it can be concluded that many methodological errors in scientific research stem from inappropriate use or misinterpretation of statistical tools rather than from the data itself. Therefore, improving researchers' statistical competence and reinforcing methodological rigor are essential for enhancing the quality of academic production.

Recommendations:

- Strengthen training in statistical methodology for researchers in media and communication fields.
- Ensure proper selection of correlation coefficients based on data type and distribution.
- Encourage the use of statistical software (such as SPSS) with correct interpretation of outputs.
- Promote methodological awareness regarding the distinction between correlation and causation.

Research perspective:

Future studies may focus on expanding the application of multivariate statistical techniques and examining their role in improving predictive models in media research, as well as integrating advanced statistical approaches in communication studies to enhance analytical depth and precision.

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