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Article

A Review of Chi-Square Test of Hypothesis and Its Applications in Real-Life Situations

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Abstract

The chi square test is an essential method in statistical research because it allows scholars to examine whether two categorical variables share a meaningful relationship by comparing observed and expected frequencies to evaluate evidence against the null hypothesis. This paper presents an overview of the chi square probability distribution and its core properties, including its mean, variance, moment generating function, and characteristic function. It also outlines the types of data that suit the chi square framework, the conditions required for valid use, and the limitations that researchers must consider along with alternative statistical options when assumptions are not satisfied. The discussion further explores the three major applications of the chi square procedure which are the goodness of fit test, the test of homogeneity, and the test of association or independence, each illustrated through examples drawn from research settings and educational contexts.

Keywords: Chi-square tests, categorical variables, probability, moment-generating function, goodness of fit test, test of association, test of homogeneity.

1. Introduction

Statistical hypothesis testing forms the cornerstone of empirical research across numerous disciplines, enabling researchers to draw meaningful conclusions from data in the presence of uncertainty and variability. Among the various hypothesis testing techniques available to modern researchers, the chi-square test stands out as one of the most versatile and widely utilised tools for analysing categorical and count data (Zhang, 2025). Whether examining the independence of variables in contingency tables or assessing the goodness of fit of observed data to theoretical distributions, the chi-square test has become indispensable in fields ranging from medical research and social sciences to quality control and epidemiology. The test's widespread adoption reflects not only its computational simplicity but also its remarkable flexibility in addressing diverse research questions that naturally arise when working with frequency data and categorical measurements. As modern data collection methods continue to generate increasingly complex datasets, understanding the nuances of chi-square testing becomes ever more critical for researchers seeking to extract valid and reliable conclusions from their empirical investigations.

Despite its prominence in statistical practice, significant gaps remain in how practitioners understand and apply the chi-square test correctly in real-world contexts. Many researchers encounter confusion regarding the test's underlying mathematical assumptions, the conditions necessary for its proper application, and the circumstances under which alternative approaches might prove more appropriate (Ahad et al., 2023). The literature reveals that incorrect application of the chi-square test remains surprisingly common, often resulting from misunderstandings about sample size requirements, the treatment of expected frequencies, and the interpretation of test results in different study designs. Furthermore, while numerous textbooks provide theoretical exposition of the chi-square test, relatively few resources adequately address the practical challenges that emerge when applying this technique to authentic research problems that contain data anomalies, missing values, or unusual distributional characteristics. This disconnects between theoretical knowledge and practical implementation creates a genuine need for comprehensive guidance that bridges the gap between abstract statistical principles and their real-world application in diverse research settings.

The present paper addresses this critical gap by providing a comprehensive review of chi-square testing methodology, with particular emphasis on its mathematical properties, conditions for appropriate application, and practical implementation strategies. The primary objectives of this review are threefold: first, to elucidate the fundamental mathematical properties and theoretical underpinnings of the chi-square test, including its relationship to other statistical distributions and its asymptotic behaviour (Aslam & Smarandache, 2023); second, to examine rigorously the conditions and assumptions that must be satisfied for valid chi-square testing, with special attention to sample size requirements and the handling of small expected frequencies; and third, to demonstrate through concrete examples how practitioners can appropriately implement chi-square testing procedures in authentic research scenarios encountered across medical, social, business, and scientific domains. By systematically addressing these three dimensions, this review aims to equip researchers with both theoretical understanding and practical wisdom necessary to deploy the chi-square test appropriately while avoiding common pitfalls that compromise statistical validity and lead to erroneous conclusions.

The chi-square distribution emerges naturally from the sum of squared independent standard normal random variables, and its mathematical characteristics have been thoroughly documented since its formalization in the early twentieth century. When researchers compute a chi-square test statistic from observed and expected frequency data, this statistic approximately follows a chi-square distribution with degrees of freedom equal to the number of independent categories minus one (Pho & Truong, 2023). The shape and behaviour of this distribution change markedly depending on the degrees of freedom involved; with smaller degrees of freedom, the distribution displays greater right skewness, while larger degrees of freedom produce a distribution approaching normality. Understanding these mathematical properties proves essential for practitioners who must interpret test statistics correctly and determine appropriate critical values for hypothesis testing at specified significance levels. Moreover, researchers must grasp how violations of the test's underlying assumptions particularly regarding minimum expected frequencies and sample independence can distort the distribution of the test statistic and compromise the validity of statistical inferences.

Real-world applications of chi-square testing span an impressive range of substantive domains and research contexts, from investigating associations between demographic variables in social surveys to detecting adverse events in medication safety monitoring and assessing independence of factors in occupational health research (Syahara et al., 2025). In medical research, chi-square tests have been employed to evaluate whether the quality of nursing services relates to family satisfaction in hospital settings, whether vaccination knowledge correlates with actual vaccination behaviours, and whether occupational characteristics predict health outcomes. Beyond healthcare, chi-square testing proves valuable for marketing researchers examining relationships between consumer characteristics and brand preferences, for quality control engineers monitoring manufacturing processes for independence between production variables, and for social scientists investigating whether demographic factors associate with attitudinal or behavioural measures (Petcu et al., 2025). These diverse applications underscore the chi-square test's remarkable utility, yet they simultaneously highlight the necessity for practitioners to maintain vigilance regarding when and how this test should be appropriately employed. Successful application requires careful verification that data meet the test's assumptions, thoughtful consideration of whether categorical analysis represents the most appropriate analytical approach for addressing specific research questions, and accurate interpretation of results within the context of actual subject matter expertise and research objectives.

2. Methodology

This research aims to provide an in-depth review of the chi-square test of hypothesis, examining its theoretical underpinnings, applications, and practical relevance in various real-world scenarios. The review focuses on how the test is used, the conditions necessary for its application, and its limitations.

2.1 Conditions for the Application of the Chi-Square Test

The chi-square test is a robust nonparametric statistical tool that requires specific conditions to be met for valid and reliable results. The foundational requirement is that the data must be categorical or nominal in nature, representing frequencies or counts rather than continuous measurements (Valarmathi et al., 2024). Researchers must ensure adequate sample size, as the chi-square test exhibits improved performance and validity with larger samples, reducing the risk of unreliable p-values when observations are sparse or unevenly distributed across categories (Cao et al., 2024).

One of the most critical conditions involves adequate cell counts, where each cell in the contingency table should contain a sufficient number of observations. The classical guideline suggests that expected frequencies in each cell must be at least five to ensure that the chi-square distribution appropriately approximates the test statistic; however, this requirement has been subject to ongoing debate in the statistical literature regarding its strict necessity. Additionally, observations must be mutually exclusive and independent, meaning each observation can belong to only one category and the response of one participant should not influence another's response (Valarmathi et al., 2024).

The chi-square test also requires random sampling to ensure that the sample accurately represents the population from which it is drawn (Valarmathi et al., 2024). Variables included in the analysis must be distinct and non-overlapping, with clear category definitions to prevent ambiguity in data classification. Furthermore, the test assumes that the expected frequencies are derived from a valid theoretical distribution or hypothesis, making accurate specification of null and alternative hypotheses essential for proper test implementation.

2.2 Limitations of Chi Square Test

Despite its widespread utility, the chi-square test carries several important limitations that researchers must acknowledge. A fundamental constraint concerns its sensitivity to small cell frequencies and small sample sizes, which can lead to inaccurate p-values and unreliable statistical inferences when data are sparse or unevenly distributed across categories (McHugh, 2013). The test exhibits difficulty when attempting to interpret results involving large numbers of categories, particularly when the independent or dependent variable contains twenty or more categories, making the output complex and challenging to interpret meaningfully (McHugh, 2013).

The chi-square test is fundamentally dependent on sample size in a problematic manner: the test statistic becomes arbitrarily large or small simply by multiplying all cell entries by a constant, regardless of whether rows are actually proportional, which creates theoretical concerns about the validity of applying this test to physical measurement data that depend on units of measurement (Gurvich & Naumova, 2025). Another significant limitation is the test's binary nature regarding hypothesis testing—it provides only a p-value indicating whether an association exists, without offering information about the strength or direction of the relationship between variables. Consequently, effect size measures such as Cramér's V must be computed separately, and this measure has been documented to produce relatively low correlation values even for highly significant results (McHugh, 2013).

The chi-square test also assumes independence between observations, rendering it inappropriate for paired data or repeated measures designs without modifications such as McNemar's test. When conducting multiple comparisons across numerous contingency tables simultaneously, the test does not provide built-in protection against inflated family-wise error rates, potentially leading to increased Type I errors if corrections are not applied (Cao et al., 2024).

2.3 Alternative Methods to Chi-Square Test When Conditions Are Violated

When chi-square test assumptions are violated, several robust alternative methods are available to researchers. Fisher's exact test has emerged as a particularly valuable alternative for analyzing 2×2 contingency tables, especially when sample sizes are small or expected cell frequencies fall below five (Bolboacă et al., 2011). This test provides exact p-values rather than relying on asymptotic approximations, making it more reliable under conditions where the chi-square test might produce misleading results. The Fisher's exact test has been characterized as the "golden test" for analyzing independence in contingency table data, offering superior performance when classical chi-square assumptions are threatened (Bolboacă et al., 2011).

For larger contingency tables or when multiple cells contain small frequencies, researchers may employ the exact unconditional test, which maintains the nominal significance level across all sample sizes without requiring minimum cell count assumptions (Bolboacă et al., 2011). The Yates correction for continuity provides a conservative approach that adjusts the chi-square test formula to improve performance with small samples, though modern statisticians debate its necessity given the availability of exact tests (Bolboacă et al., 2011). When analyzing repeated measures or paired categorical data, the McNemar's chi-square test offers an appropriate modification of the classical test, specifically designed to account for the correlation structure inherent in paired observations.

The U-statistic permutation (USP) test represents a newer nonparametric approach that guarantees control of Type I error rates at nominal levels for all sample sizes and has demonstrated dramatically greater power than traditional chi-square tests under various scenarios (Kelter, 2021). Mantel-Haenszel tests can be applied to stratified contingency table analysis, providing alternative approaches that can accommodate the specific structure of study designs (Bolboacă et al., 2011). Additionally, logistic regression offers a flexible modeling alternative that can handle categorical outcomes while simultaneously accommodating continuous predictors and interaction terms, providing effect size estimates along with significance testing.

2.4 The Three Applications of Chi-Square

The three primary applications of chi-square tests address distinct research questions in categorical data analysis, each with specific methodological considerations. The Goodness-of-Fit test evaluates whether an observed frequency distribution of categorical data conforms to a theoretically expected distribution (Valarmathi et al., 2024). This application tests whether sample data follow a specified probability distribution, such as testing whether student enrollment across academic programs matches predicted or uniform distributions. Researchers use this test when investigating whether experimental data deviate significantly from theoretical expectations, making it fundamental for validating distributional assumptions and detecting departures from null hypotheses regarding population proportions.

The Test of Independence investigates whether a relationship exists between two categorical variables within a single sample, examining whether the categories of one variable are independent of categories in another variable (Valarmathi et al., 2024). This application is widely used in medical, social, and behavioral research to determine associations between treatments and outcomes, such as investigating whether a specific intervention type is associated with patient recovery status. The test compares observed frequencies against expected frequencies calculated under the assumption that the two variables are completely independent, with significant deviations suggesting that the variables share a genuine relationship.

The Test of Homogeneity compares the frequency distributions of a categorical variable across multiple independent populations to determine whether distributions are similar across groups (Valarmathi et al., 2024). This application tests whether the pattern of responses or characteristics is consistent across different populations, such as comparing whether purchasing preferences differ significantly across demographic groups or geographic regions. The test examines whether the proportion structure for a categorical outcome remains constant across different population subgroups, making it particularly valuable for quality control, educational research, and epidemiological studies investigating whether disease patterns differ across geographic areas or time periods.

2.5 General Procedure for carrying out Chi square Hypothesis testing

i. Define H_0 (null hypothesis) and H_1 (alternative hypothesis) clearly based on the research question.
ii. Choose the significance level (α): Typically set at 0.05 or 0.01, depending on the field of study and research requirements.
iii. Calculate the degrees of freedom (df): Determine the df based on the number of categories in the data.
iv. Collect and organize the data: Gather observed frequencies and calculate expected frequencies if necessary.
v. Calculate the chi-square statistic:

$$x^2 = \sum_{i=1}^{r}\sum_{j=1}^{c}\frac{\left(O_{ij} - E_{ij}\right)^2}{E_{ij}}$$

Where O_{ij} is the observed frequency and E_{ij} is the expected frequency

vi. Determine the critical value using chi-square distribution table or statistical software to find the critical value based on the df and α.
vii. Compare the calculated χ^2 value with the critical value: If the calculated χ^2 exceeds the critical value, reject H_0; otherwise, fail to reject H_0.
viii. Interpret the results explaining the findings in the context of the research question, considering practical significance.

3. Results

This section demonstrated the three applications of Chi square using real-life data.

3.1 Test of Goodness of Fit

To assess the goodness of fit, data from Tom Clark and Liam Foster were utilised. This data represents the frequency of burglaries committed in Sheffield by days of the week for the year 2010 (Table 1-3).

Table 1: Number of Burglaries Committed by Day of the Week

Days of the Week	Burglaries committed
Sunday	44
Monday	54
Tuesday	61
Wednesday	65
Thursday	52
Friday	95
Saturday	98

Source: Clark & Foster (2015).

Hypothesis:
H_{01}: Burglaries committed are uniformly distributed across the week.
H_{11}: Burglaries committed are not uniformly distributed across the week.
Using Minitab, we have the exact result above with the same interpretation.

Table 2: Goodness-of-Fit Test for Burglaries by Day of the Week

Category	Observed	Test Proportion	Expected	Contribution to Chi-Square
Sun	44	0.142857	67	7.8955
Mon	54	0.142857	67	2.5224
Tue	61	0.142857	67	0.5373
Wed	65	0.142857	67	0.0597
Thu	52	0.142857	67	3.3582
Fri	95	0.142857	67	11.7015
Sat	98	0.142857	67	14.3433

Table 3: Chi-Square Goodness-of-Fit Test Results

N	DF	Chi-Sq	P-Value
469	6	40.4179	0.000

Since the p-value is less than 0.05 (alpha level). Therefore, we reject the null hypothesis, indicating that burglaries are not uniformly distributed throughout the week.

3.2 Test of Association/Independence of Attributes

To examine the relationship between gender and perceived safety while walking alone in the dark, we utilize data from the 2000 British Crime Survey, which includes a sample size of 19,319 individuals (Table 4, 5). This survey was administered to a cross-sectional sample of the public in England and Wales between January 1999 and February 2000.

Hypothesis:

H_{02}: There is no significant difference in the perception of safety between men and women when walking home at night.
H_{12} A significant association exists between gender and the perception of safety when walking home alone at night.

Table 4: Cross-Tabulation of Gender and Perceived Safety While Walking Alone at Night *(2000 British Crime Survey)*

	Very Safe	Fairly Safe	A Bit Safe	Very Unsafe
MALE	3475	3930	1031	365
Expected	2158	3723	1836	1084
FEMALE	1262	4242	2999	2015
Expected	2579	4449	2194	1296

Source: Kershaw et al. (2000)

$$E_{ij} = \frac{Row\ Total\ \times Column\ Total}{Overall\ Total} \quad E_{11} = \frac{8801\ \times 4737}{19319} = 2158$$

Table 5: Chi-Square Test of Independence for Gender and Perceptions of Safety

	Chi-Square	DF	P-Value
Pearson	3021.992	3	0.000

Conclusion:

Since the P-value is 0.000, which is less than the significance level of $\alpha = 0.05$, we reject the null hypothesis. This indicates a significant association between gender and the perception of safety when walking home alone at night.

3.3 Test of Homogeneity

Ivy League schools receive many applications, but only some can be accepted. At the schools listed in Table 6, two types of applications are accepted: regular and early decision.

Table 6: Distribution of Regular versus Early Decision Admissions for a Cohort of Six Ivy League Universities

Application Type Accepted	Brown	Columbia	Cornell	Dartmouth	Penn	Yale
Regular	2115	1792	5306	1734	2685	1245
Early Decision	557	627	1228	444	1195	761

Source: Agresti (2018)

We want to know if the number of regular applications accepted follows the same distribution as the number of early applications accepted. That is a test of homogeneity.

Hypothesis

H_{03}: The distribution of regular applications accepted is the same as the distribution of early applications accepted.

H_{13}: The distribution of regular applications accepted is not the same as the distribution of early applications accepted

Table 7: Observed and Expected Frequencies of Applications Accepted by Institution and Decision Type (Regular vs. Early)

	Brown	Columbia	Cornell	Dartmouth	Penn	Yale	Total
Regular	2115	1792	5306	1734	2685	1245	**14877**
Expected	2019	1828	4937	1646	2932	1516	
Early Decision	557	627	1228	444	1195	761	**4812**
Expected	653	591	1597	532	948	490	
Total	**2672**	**2419**	**6534**	**2178**	**3880**	**2006**	**19689**

Table 7: Observed and Expected Frequencies of Applications Accepted by Institution and Decision Type (Regular vs. Early)

	Chi-Square	DF	P-Value
Pearson	436.556	5	0.000

Conclusion

Since the P-value is 0.000, which is less than the significance level of $\alpha = 0.05$, we reject the null hypothesis. This suggests that the distribution of regular applications accepted differs from the distribution of early applications accepted.

4. Discussion

The probability density function of the chi-square distribution is derived from the square of a normal variate and is given by:

$$f_Y(y) = \frac{1}{2^{n/2}\Gamma(n/2)} y^{n/2-1} e^{-y/2} for\ n, y > 0$$

where n represents the degrees of freedom. The mean of the chi-square distribution is equal to the degrees of freedom, and the variance is twice the degrees of freedom. The moment generating function and the characteristic function are:

$$M_X(t) = (1-2t)^{-n/2}$$

$$\varphi_X(t) = (1-2it)^{-n/2}$$

The chi-square test has several important applications in real-world scenarios, including:

4.1 Goodness of Fit Testing

This test determines whether a sample dataset follows a specified distribution. For example, it can assess whether patient data follows a normal distribution, a key application in medical research. Findings in previous literature support the widespread use of the chi-square goodness of fit test, particularly in genetics for evaluating Mendelian inheritance patterns. Misinterpretation, however, can occur when expected frequencies are too low, leading to inaccuracies in the test.

4.2 Testing for Independence

This test assesses whether two categorical variables are related or independent. An example is examining whether gender influences voting preferences. Prior studies have consistently used this test to explore relationships in social and behavioral sciences.

4.3 Homogeneity Testing

This application checks whether frequency counts are consistent across different samples. For example, comparing defect rates between two manufacturing plants. In a practical application, data from burglaries committed in Sheffield across the days of the week in 2010 were analyzed for goodness of fit. The p-value of 0.000, significantly below the alpha level of 0.05, led to the rejection of the null hypothesis, indicating that burglaries were not uniformly distributed across the week.

Further, data from the 2000 British Crime Survey, with a sample size of 19,319, was analyzed to examine the association between gender and perceived safety when walking alone at night. The p-value (0.000) was again less than the alpha level (0.05), leading to the rejection of the null hypothesis and confirming a significant association between gender and perceptions of safety.

Finally, an analysis was conducted to determine whether the distribution of regular applications accepted differed from that of early applications accepted. The significant p-value of $0.000 < \alpha = 0.05$ demonstrated that the distributions were indeed different. In summary, the chi-square test has proven to be a robust and flexible tool for hypothesis testing across a wide range of fields. Its ability to reveal significant patterns in categorical data has made it indispensable, though researchers must remain vigilant about meeting the test's assumptions to ensure valid results.

5. Conclusion

The chi-square test of hypothesis continues to serve as a fundamental statistical instrument for the analysis of categorical data across a broad spectrum of research fields. Its utility is illustrated through three principal applications: goodness-of-fit, test of independence, and test of homogeneity, each demonstrated with empirical examples in this review. Despite its versatility and relative computational simplicity, the validity of the chi-square test depends on strict adherence to its underlying assumptions, including sufficient sample size, adequate expected cell frequencies, and independence of observations. When these conditions are not satisfied, researchers must carefully consider alternative approaches such as Fisher's exact test or logistic regression to ensure the rigor and reliability of statistical inferences. Consequently, a comprehensive appreciation of both the theoretical foundations and practical limitations of the chi-square test is critical for its proper application and for promoting robust, evidence-based conclusions in both scientific inquiry and applied research contexts.

6. Recommendation

Based on this study, several recommendations are proposed to enhance the use of chi-square tests. Teaching strategies should address pedagogical challenges and incorporate interactive tools to improve student comprehension. Comparative studies with other nonparametric tests, such as Fisher's exact test and the Kruskal-Walli's test, are needed to guide appropriate test selection. The application of chi-square tests in machine learning and data mining, particularly for feature selection and model evaluation, should be explored. Finally, the development of user-friendly software or packages to facilitate implementation and interpretation would increase accessibility for practitioners across disciplines.

References

Ahad, N., Okwonu, F., Apanapudor, J. S., Arunaye, F., & Ojobor, S. A. (2023). Chi-square and adjusted standardised residual analysis. *American Statistical and Mathematical Sciences, 2023*, Article 985. https://doi.org/10.32802/asmscj.2023.985

Aslam, M., & Smarandache, F. (2023). Chi-square test for imprecise data in consistency table. *Frontiers in Applied Mathematics and Statistics, 9*, Article 1279638. https://doi.org/10.3389/fams.2023.1279638

Bolboacă, S. D., Jäntschi, L., Şeştraş, A. F., Şeştraş, R. E., & Pamfil, D. (2011). Pearson–Fisher chi-square statistic revisited. *Information*, 2(3), 528–545. https://doi.org/10.3390/info2030528

Cao, Y., Chen, R. C., & Katz, A. J. (2024). Why is a small sample size not enough? *The Oncologist*. 29(9): 761–76. https://doi.org/10.1093/oncolo/oyae162

Gurvich, V., & Naumova, M. (2025). Critical issues with Pearson's chi-square test. *Modern Mathematics and Modeling*, 3(2), 101-109. https://doi.org/10.64700/mmm.75

Kelter, R. (2021). Analysis of type I and II error rates of Bayesian and frequentist parametric and nonparametric two-sample hypothesis tests under preliminary assessment of normality. *Computational Statistics, 36*, 1263–1288. https://doi.org/10.1007/s00180-020-01034-7

McHugh, M. L. (2013). The chi-square test of independence. *Biochemia Medica, 23*(2), 143–149. https://doi.org/10.11613/BM.2013.018

Petcu, F.-Ș., Iorga, M., Semenescu, A., & Marcu, D. (2025). Analysis of research hypotheses regarding the use of electronic means of communication with ANAF. In *Proceedings of the International Conference on Business Excellence (PICBE)*. https://doi.org/10.2478/picbe-2025-0422

Pho, K.-H., & Truong, B.-C. (2023). Pearson chi-squared and unweighted residual sum of square tests of fit for a probit model. *Communications in Statistics – Simulation and Computation, 52*(4). https://doi.org/10.1080/03610918.2023.2202369

Syahara, R., Sari, I. N., & Silalahi, R. D. (2025). The relationship of the quality of nursing services with family satisfaction in the perinatology room of RSUD Muhammad Sani 2024. *Jurnal Kesehatan, 15*(2), Article 1686. https://doi.org/10.37776/zk.v15i2.1686

Valarmathi S., Hemapriya, A. S., & Sundar, J. S. (2024). Chi-square tests: A quick guide for health researchers. *International Journal of Advanced Research*, 12(10), 1214-1222. https://doi.org/10.21474/ijar01/19746

Zhang, S. (2025). Analysis and optimization of the applicability of hypothesis testing methods. *Computational Science and Technology, 24*(261). https://doi.org/10.54254/3029-0880/2025.24261

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