# Chi-Square Analysis

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This report contains chi-square analysis of categorical variables

in the customer journey data.

# Chi-Square Analysis Report

## Introduction

This report presents chi-square analysis of categorical variables in the customer journey data. Chi-square tests are used to determine if there is a significant association between categorical variables. The analysis includes contingency tables, expected frequencies, standardized residuals, and visualizations.

## Data Overview

The dataset contains 1000 customer journey records. Each record represents a customer interaction with the following categorical attributes: source, device, and outcome.

## Variable Distributions

Distribution of customer sources:

Mobile App: 28.5%
Website: 27.6%
Social Media: 22.1%
Email: 13.6%
Referral: 8.2%
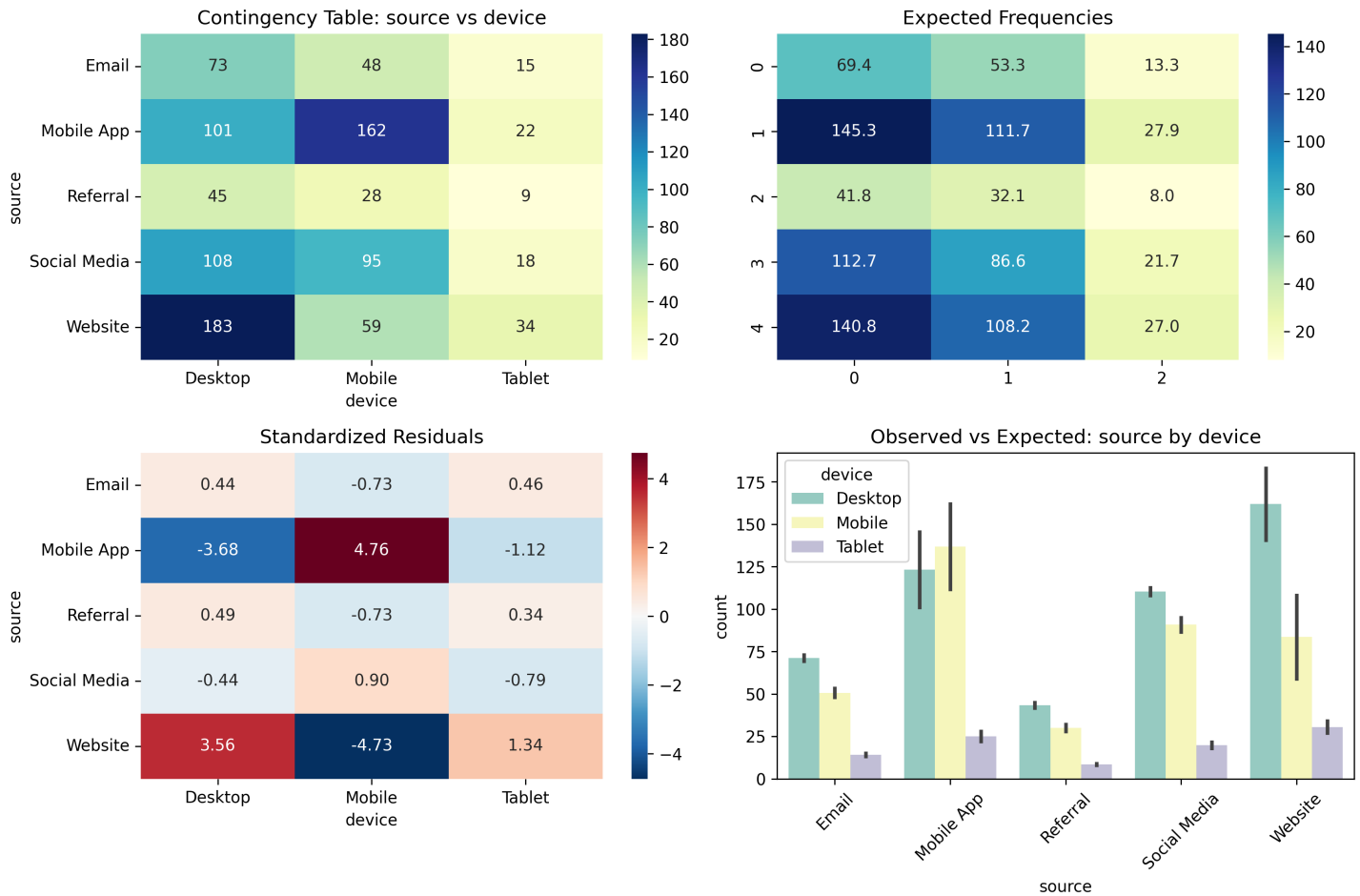
Distribution of customer devices:

Desktop: 51.0%
Mobile: 39.2%
Tablet: 9.8%

Distribution of customer outcomes:

Add to Cart: 30.5%
Browse: 29.7%
Bounce: 20.5%
Purchase: 19.3%

# Chi-Square Analysis Report

## Chi-Square Analysis: source vs device



Contingency Table: source vs device



Expected Frequencies



Standardized Residuals



Observed vs Expected: source by device

Chi-square test results:

Chi-square statistic: 77.69
Degrees of freedom: 8
P-value: 0.0000

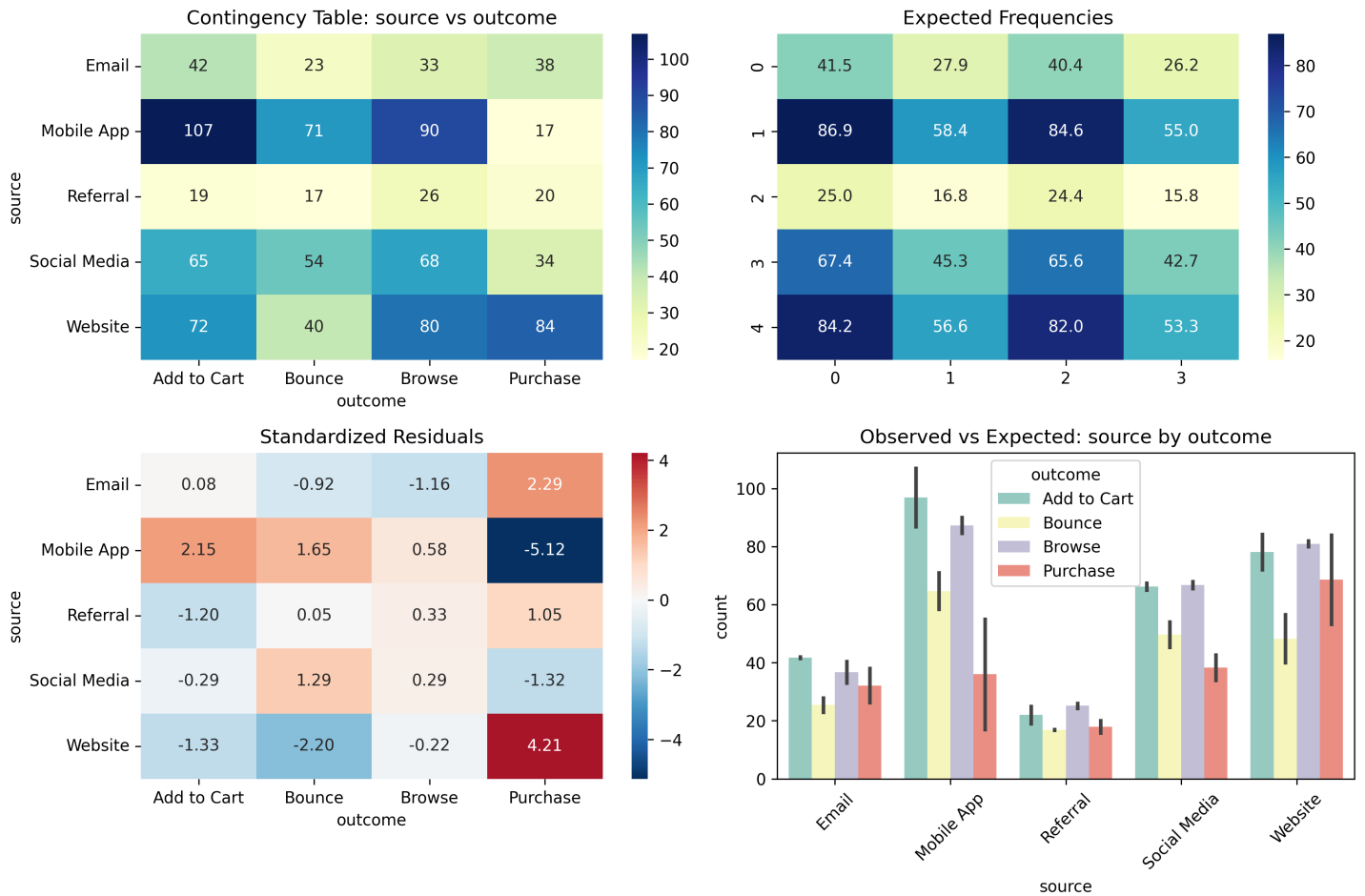Conclusion: There is a significant association between the variables (p < 0.05).

Interpretation of standardized residuals:
- Values > 2 indicate cells with more observations than expected
- Values < -2 indicate cells with fewer observations than expected
- Values between -2 and 2 indicate cells with approximately expected observations

# Chi-Square Analysis Report

## Chi-Square Analysis: source vs outcome



Contingency Table: source vs outcome

| source | Add to Cart | Bounce | Browse | Purchase |
|---|---|---|---|---|
| Email | 42 | 23 | 33 | 38 |
| Mobile App | 107 | 71 | 90 | 17 |
| Referral | 19 | 17 | 26 | 20 |
| Social Media | 65 | 54 | 68 | 34 |
| Website | 72 | 40 | 80 | 84 |

Expected Frequencies

| | 0 | 1 | 2 | 3 |
|---|---|---|---|---|
| 0 | 41.5 | 27.9 | 40.4 | 26.2 |
| 1 | 86.9 | 58.4 | 84.6 | 55.0 |
| 2 | 25.0 | 16.8 | 24.4 | 15.8 |
| 3 | 67.4 | 45.3 | 65.6 | 42.7 |
| 4 | 84.2 | 56.6 | 82.0 | 53.3 |

Standardized Residuals

| source | Add to Cart | Bounce | Browse | Purchase |
|---|---|---|---|---|
| Email | 0.08 | -0.92 | -1.16 | 2.29 |
| Mobile App | 2.15 | 1.65 | 0.58 | -5.12 |
| Referral | -1.20 | 0.05 | 0.33 | 1.05 |
| Social Media | -0.29 | 1.29 | 0.29 | -1.32 |
| Website | -1.33 | -2.20 | -0.22 | 4.21 |

Observed vs Expected: source by outcome

Chi-square test results:

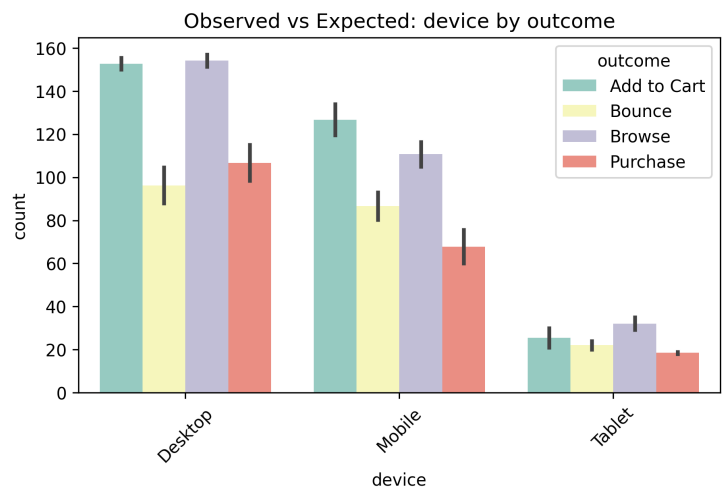Chi-square statistic: 72.07
Degrees of freedom: 12
P-value: 0.0000

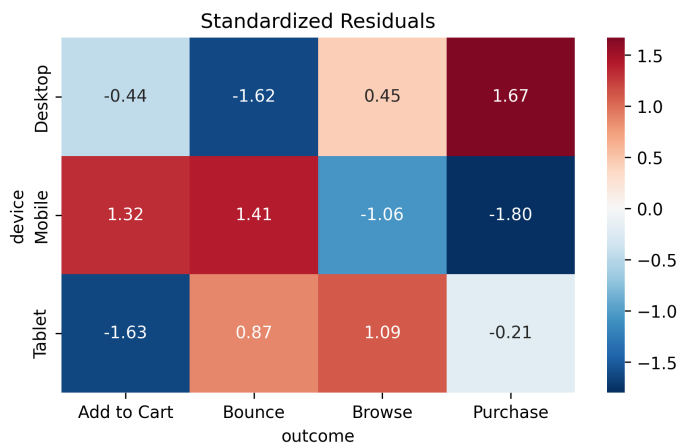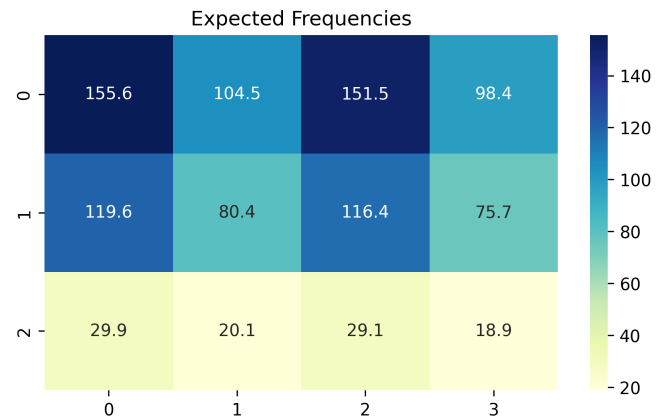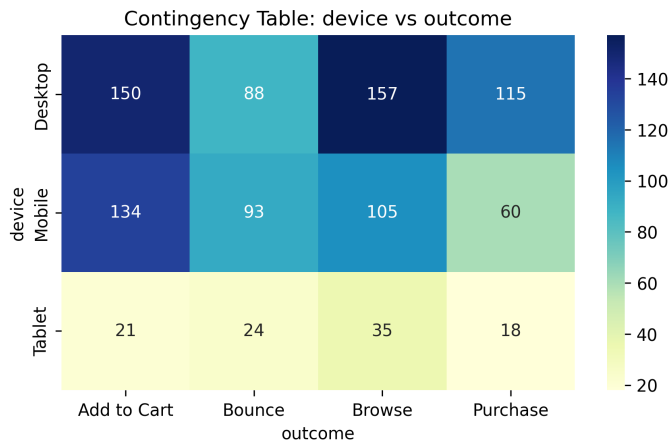Conclusion: There is a significant association between the variables (p < 0.05).

Interpretation of standardized residuals:
- Values > 2 indicate cells with more observations than expected
- Values < -2 indicate cells with fewer observations than expected
- Values between -2 and 2 indicate cells with approximately expected observations

# Chi-Square Analysis Report

## Chi-Square Analysis: device vs outcome



Chi-square test results:

Chi-square statistic: 18.54
Degrees of freedom: 6
P-value: 0.0050

Conclusion: There is a significant association between the variables (p < 0.05).

Interpretation of standardized residuals:
- Values > 2 indicate cells with more observations than expected
- Values < -2 indicate cells with fewer observations than expected
- Values between -2 and 2 indicate cells with approximately expected observations