

Let's evaluate the results by focusing on those tests that met the minimum expected frequency of 5 and discuss the reliability of the insights they provide.

Results Meeting the Expected Frequency Requirement

1. Ship Mode vs. Segment

- **Chi-squared Statistic:** 25.84
- **P-value:** 0.00024
- **Degrees of Freedom:** 6
- **Insight:** This test met all requirements, indicating a statistically significant association between Ship Mode and Segment. This may suggest that specific customer segments tend to prefer certain shipping modes.

2. Order Month vs. Segment

- **Chi-squared Statistic:** 63.63
- **P-value:** 6.39e-06
- **Degrees of Freedom:** 22
- **Insight:** With a p-value far below 0.05, there is a statistically significant association between the Order Month and Segment, which may imply that certain customer segments are more active during specific months.

3. Ship Mode vs. Region

- **Chi-squared Statistic:** 22.14
- **P-value:** 0.0085
- **Degrees of Freedom:** 9
- **Insight:** This association is statistically significant, suggesting that shipping preferences may vary by region, possibly due to logistics, availability, or regional customer behavior.

4. Order Month vs. Region

- **Chi-squared Statistic:** 91.46
- **P-value:** 2.14e-07
- **Degrees of Freedom:** 33

- **Insight:** This indicates a strong association between Order Month and Region, suggesting seasonal purchasing trends vary regionally.

5. Segment vs. Ship Mode

- **Chi-squared Statistic:** 25.84
- **P-value:** 0.00024
- **Degrees of Freedom:** 6
- **Insight:** Reinforces that customer segment and shipping mode are significantly associated, with certain segments showing a preference for specific shipping options.

6. Order Month vs. Ship Mode

- **Chi-squared Statistic:** 87.40
- **P-value:** 8.23e-07
- **Degrees of Freedom:** 33
- **Insight:** Indicates a significant association between Order Month and Ship Mode, suggesting that shipping preferences vary by time of year.

7. Segment vs. Order Month

- **Chi-squared Statistic:** 63.63
- **P-value:** 6.39e-06
- **Degrees of Freedom:** 22
- **Insight:** This significant association may point to specific customer segments showing distinct ordering patterns throughout the year.

8. Region vs. Order Month

- **Chi-squared Statistic:** 91.46
 - **P-value:** 2.14e-07
 - **Degrees of Freedom:** 33
 - **Insight:** There is a meaningful association between Region and Order Month, potentially reflecting regional sales trends across different months.
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Interpretation Summary

These results confirm that the segments, shipping modes, and regions align differently with ordering months and preferred ship modes, reflecting potential seasonality and logistical choices. This detailed breakdown, focusing on those with sufficient expected frequencies, supports exploring further customized strategies for each segment and regional market trends based on these preferences.

For the results that didn't meet the required frequency, we'll treat them as potentially significant but interpret them cautiously due to the limitations on reliability in those cases.