

We can still rely on the results of our post-hoc analysis, but with specific considerations due to the violation of the normality assumption. Here's a breakdown of how to interpret our findings in light of the normality issue:

### 1. Reliability of the Results

- **Non-parametric Context:** If we used a non-parametric test like Dunn's test, our results are generally more reliable despite the normality violation. Non-parametric tests are less affected by the distribution of data, making them suitable for our situation.
- **Statistical Significance:** The extremely low p-values for the comparisons indicate strong evidence against the null hypothesis. This suggests that the differences in log-transformed sales between the categories are statistically significant.

### 2. Interpretation of Findings

- **Furniture vs. Office Supplies:** The p-value of  $1.534319 \times 10^{-138}$  shows an overwhelming significance, indicating that sales performance in these categories is notably different.
- **Furniture vs. Technology:** A p-value of  $5.207264 \times 10^{-02}$  is just below the alpha level, supporting a significant difference in sales between these categories.
- **Office Supplies vs. Technology:** The p-value of  $2.001982 \times 10^{-154}$  reinforces that there is a significant difference in sales between these two categories.

### 3. Implications for Decision-Making

- **Strategic Focus:** The significant differences among categories imply that we should tailor our strategies—such as sales tactics, inventory management, and marketing efforts—according to the distinct performance metrics of each category.
- **Resource Allocation:** Understanding which categories perform better can inform our resource allocation and promotional strategies to enhance overall sales performance.

### 4. Cautions and Considerations

- **Practical Significance:** While the statistical differences are clear, we should assess the effect sizes to understand the magnitude of these differences and their implications for business decisions.
- **Acknowledging Normality Violations:** We must be transparent about the normality violation when reporting results. While the statistical methods used allow for meaningful

interpretation, acknowledging the data's distribution characteristics will provide a more nuanced understanding of the results.

## Conclusion

In summary, while the normality assumption violation does warrant caution, the significant results from our post-hoc analysis can still be considered reliable, especially if non-parametric methods were used. We should interpret the findings in the context of their practical implications and ensure to communicate the nuances of the analysis clearly when making business decisions.

