GloBox A/B Test Analysis

Experiment: Food & Drink Landing Page Banner

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Abstract

This analysis presents the findings of an A/B test conducted by GloBox to evaluate the impact of a food and drink landing page banner on user conversions. The test revealed a significant increase in the conversion rate with the banner, indicating its effectiveness in driving user engagement. However, it did not result in a significant change in the average amount spent per user. The results were further analyzed by device, gender, and region, revealing variations in conversion rates.

Based on the results, it is recommended not to proceed with launching this experiment. However, if there is a strong interest in the experiment, it is suggested to implement the food and drink banner permanently. In doing so, focus on optimizing the design and placement of the banner, and develop personalized strategies tailored to different user segments. Continuous monitoring and analysis should be conducted to ensure ongoing optimization and success.

Introduction

GloBox, decided to conduct an A/B test to increase awareness and revenue in the food and drink category. The test involved displaying a banner highlighting key food and drink products to the test group while the control group did not see the banner. The goal was to determine if the banner had a significant impact on user conversions.

In this analysis, we conducted hypothesis tests to examine the difference in conversion rates and average amount spent per user between the control and treatment groups in an A/B test.

For the conversion rate, the resulting p-value was 0.0001, indicating statistical significance. We reject the null hypothesis that there is no difference in the user conversion rate between the groups. This suggests that displaying the banner to the treatment group had a positive impact on conversions.

The 95% confidence interval for the difference in conversion rates between the treatment and control groups was (0.0035, 0.0107). This interval suggests that the treatment group had a higher conversion rate than the control group, with a minimum improvement of 0.35% and a maximum improvement of 1.07%.

Regarding the average amount spent per user, the hypothesis test resulted in a p-value of 0.944, which is not statistically significant. We fail to reject the null hypothesis, indicating no significant difference in the mean amount spent per user between the groups.

The 95% confidence interval for the difference in average amount spent per user between the treatment and control groups was (-0.439, 0.471). This interval suggests that there is no substantial difference in the average amount spent between the groups.

Test Design

The Growth team decided to run an A/B test that highlighted key products in the food and drink category as a banner at the top of the website. The control group did not see the banner, while the test group saw it as shown below:

Group A: Control
existing landing page

Group B: Treatment
landing page with food & drink banner

Experiment Overview:

- The A/B test was conducted exclusively on the mobile website.
- Users visiting the GloBox main page were randomly assigned to either the control or test group based on their join date.
- The banner was displayed to the test group, while the control group did not see the banner.
- User conversions were tracked, considering any purchase made on the website.

Test parameters

We ran this experiment in Q1 2023 with the following parameters:

Date Range	Jan 25th-Feb 6th 2023(12 days)
Traffic Split	50/50
Platforms	Mobile-only(iOS + Android)
Countries	AUS, BRA, CAN, DEU, ESP, FRA, GBR, MEX, TUR, USA
Total Users	48943

Success Metrics

We chose the following metrics to measure the success of this experiment:

- User conversion rate (%): the percentage of users in the experiment that made a purchase during the experiment.
- Average amount spent ($): the average amount USD spent for all users in the experiment (both converted and not) during the experiment. This measures the expected change in overall revenue.

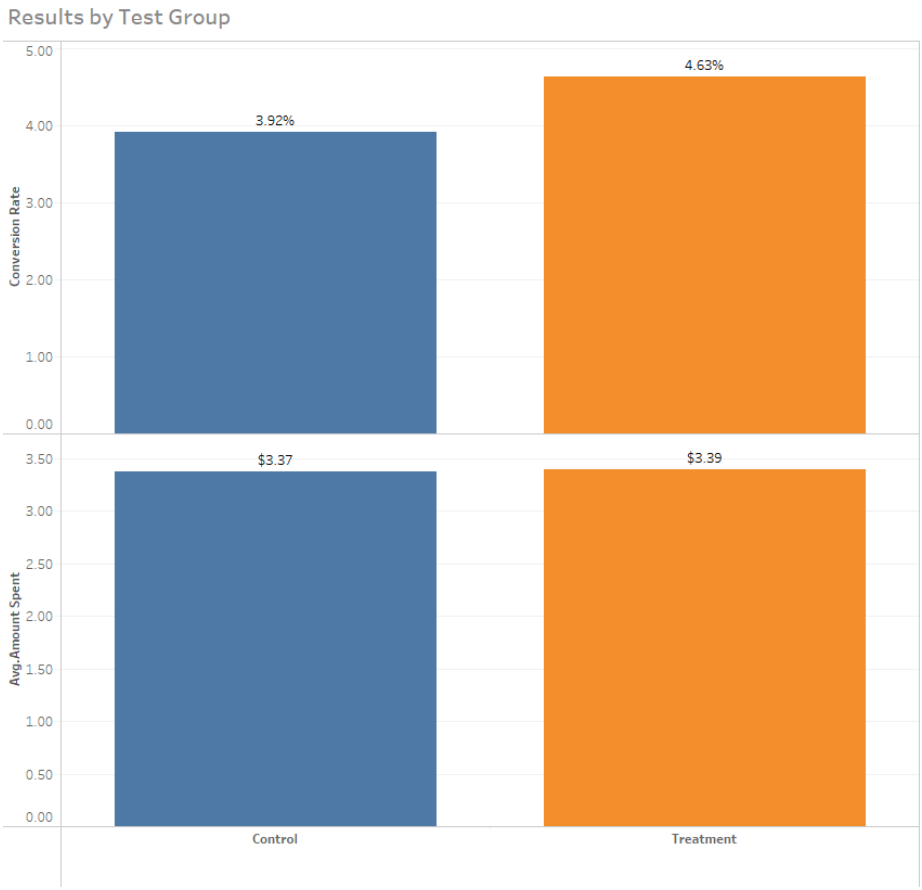
Results

Overall Results

We found that the banner led to a significant increase in user conversion rate, but the average amount spent per user (revenue) was unaffected.

Hypothesis tests for the equality between the two groups

- The conversion rate was 3.92% in the control group and 3.63% in the treatment group, which is a +18% relative change. Our hypothesis test result was $p= 0.0001<0.05$, indicating statistical significance. So, we reject the null hypothesis that there is no difference in the user conversion rate between the groups.
- The average amount spent per user was $3.37 in the control group and $3.39 in the treatment, which is a +0.5% relative change. Our hypothesis test result was $p=0.94>0.5$, which is not statistically significant. We fail to reject the null hypothesis, indicating no significant difference in the mean amount spent per user between the groups.



In addition, we can calculate the confidence intervals to determine the range of possible differences between the two groups for each of the metrics of interest.

Confidence intervals for the differences between the two groups

- With a 95% confidence level, we can state that the difference in conversion rates between the treatment and control groups falls within the range of 0.35% to 1.07%. Notably, this interval does not include zero, indicating a statistically significant result.

- With a 95% confidence level, we can state that the difference in the average amount spent per user between the treatment and control groups falls within the range of -$0.44 and $0.47. It is worth noting that this interval is centered almost exactly around zero, indicating that the result is not statistically significant.

Results Breakdown

When we breakdown the results by device, gender, and region, a few things stand out:

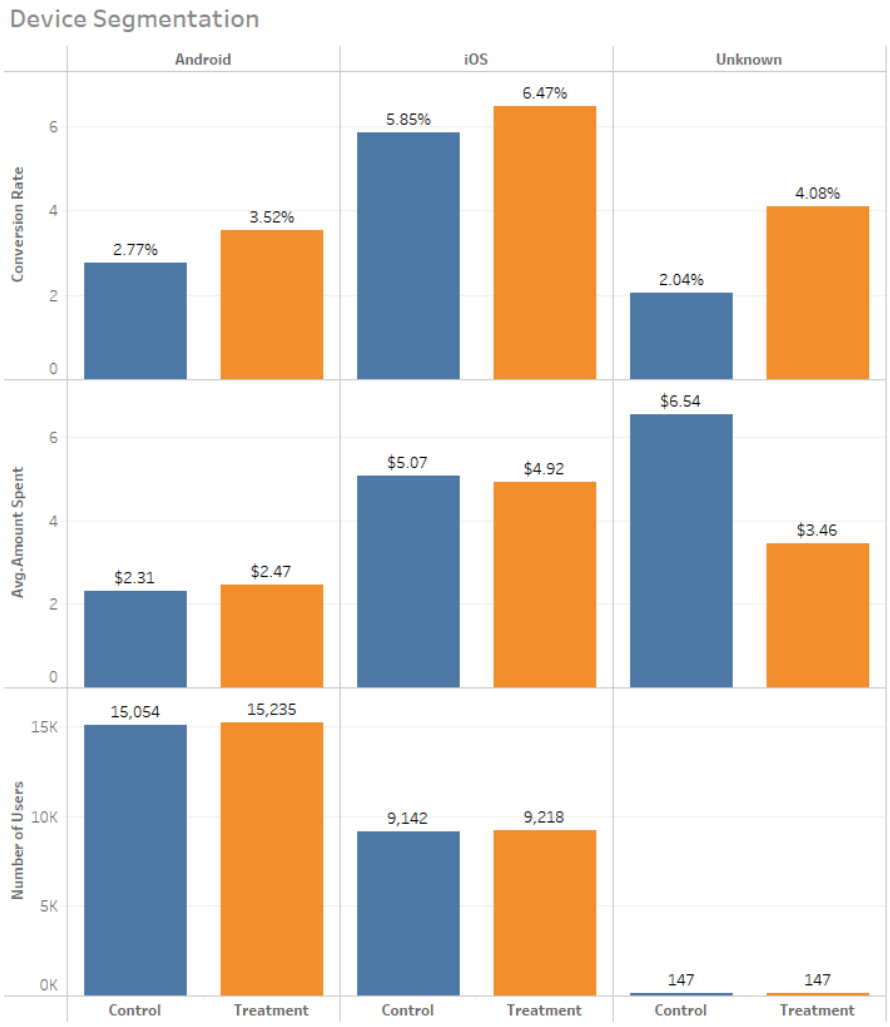
- Higher increase in conversion rate for Android (+27%) than iOS (+10%).

- Higher increase in conversion rate for Male (+44%) than Female (+6%).
- Slightly higher increase in conversion rate for North America and Europe.
- Average amount spent per user is pretty consistently flat across segments.

These results are broken down in more details bellow.

Results by Device

When we segment by device, we see that both platforms had a higher conversion rate with the treatment group.



We observed a 27% relative increase in conversion rate for Android and 10% for iOS. It may be worth investigating why the increase was higher on Android. Both platforms show little to no

change in the average amount spent per user. There were some users with unknown devices, but it is a small enough number that we can ignore them for the purpose of this results.

Results by Gender

When we segment by gender, we see that conversion rate increased the most for mail users.

here were noticeable relative changes in conversion rate among different gender categories. Females experienced a relative increase of 6%, while males saw a significant increase of 44%. On the other hand, the "Other" gender category showed a relative decrease of 6%, and the "Unknown" gender category had a relative increase of 20%. Additionally, the average amount

spent per user exhibited a relative increase of 16% for males but a 7% decrease for females, although the significance of these changes is uncertain.

Despite examining user distributions across platforms and countries, there is no clear explanation for why males converted more from the banner compared to females. Other factors apart from platform and country distribution seem to influence this difference but are yet to be identified.

Country/Gender

Country	Female	Male	Other	Unknown
AUS	41.87%	40.75%	4.71%	12.67%
BRA	40.52%	42.22%	3.57%	13.68%
CAN	40.96%	41.66%	3.63%	13.76%
DEU	41.44%	41.65%	3.22%	13.70%
ESP	40.84%	40.29%	3.31%	15.55%
FRA	42.56%	39.64%	3.56%	14.24%
GBR	40.79%	42.59%	3.12%	13.50%
MEX	41.76%	40.50%	3.66%	14.08%
TUR	40.62%	42.26%	3.03%	14.09%
USA	41.02%	41.43%	3.32%	14.23%
Unknown	42.61%	41.37%	2.33%	13.69%

Device/Gender

Device Type	Female	Male	Other	Unknown
Android	41.21%	41.22%	3.55%	14.03%
iOS	41.10%	41.77%	3.18%	13.95%
Unknown	35.03%	45.92%	3.74%	15.31%

The observed slight decrease in conversion rate for the "Other" gender category may be attributed to noise in the data due to the relatively low sample size. It is important to note that the "Unknown" gender category, representing approximately 14% of users, likely consists of individuals who chose not to specify their gender during the signup process.

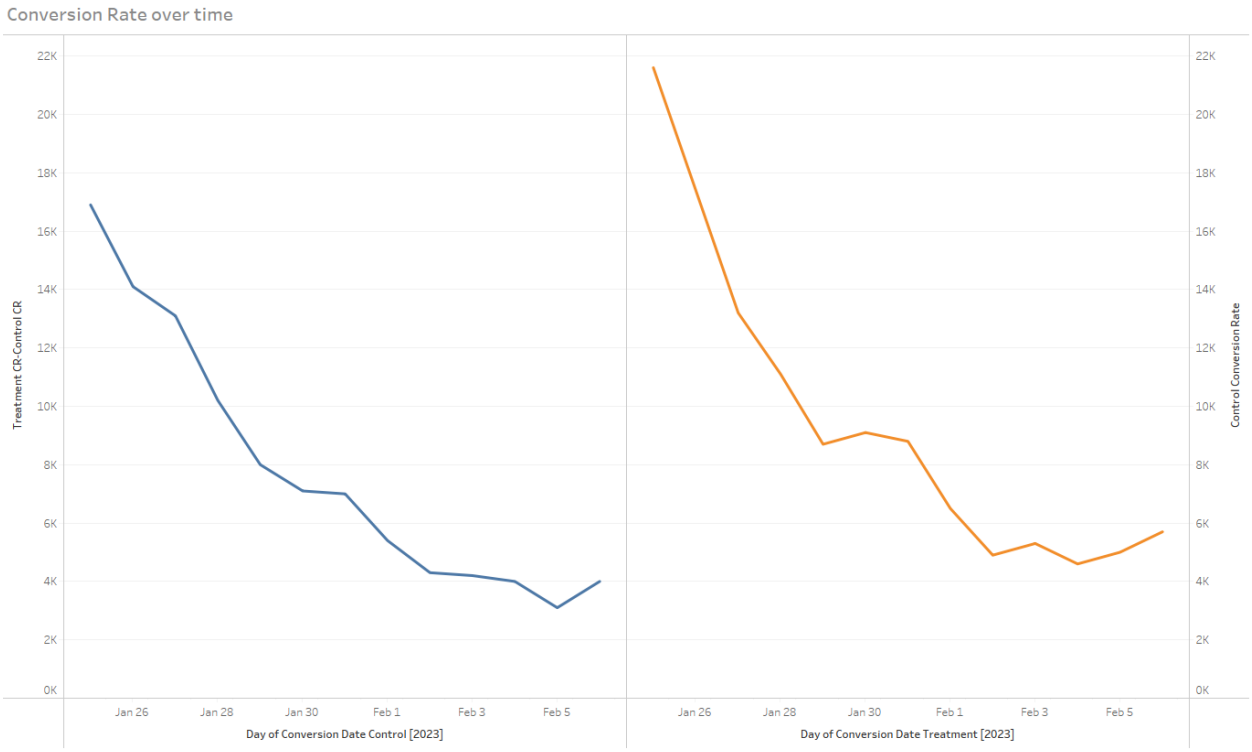
Results by Region

There is an increase in conversion rate across regions, and the average amount spent per user was pretty consistently flat.

We see a relative change in conversion rate of +20% for North America, +19% for Europe, +9% for South America, +42% for Australia, and -25% for Unknown. The change for Australia an Unknown is likely noisy due to the small sample size.

Novelty Effect

There is no evident presence of a novelty effect in our conversion rate results. To further confirm this, we can perform a quick analysis by examining the difference in conversion rates between the two groups over time. This analysis allows us to observe the cumulative conversion rate, considering all users who joined and converted up to a specific date. By examining the overall results as if we had concluded the A/B test on that date, we can assess the presence of any significant variations.



Recommendation

Based on the overall results, it is recommended not to proceed with launching this experiment. Although the conversion rate showed an impressive +18% lift, there was no significant change in the average amount spent per user (revenue).

However, if we have a strong interest in this feature and want to continue iterating, we should consider the following:

- Explore whether there is cannibalization of existing product categories and make adjustments to the user experience accordingly.
- Extend the duration of the experiment to ensure a sufficient sample size for more reliable insights.
- Focus on optimizing the design and placement of the banner.

Conclusion

The A/B test results demonstrate that the food and drink banner had a significant positive impact on user conversion rates. However, it did not lead to a significant change in the average amount spent per user. Despite this, the findings suggest the importance of implementing the banner permanently and leveraging personalized strategies for different user segments. Further

optimization efforts are recommended to enhance the effectiveness of the banner and increase the average transaction value. Continuous monitoring, analysis, and exploration of additional strategies will be crucial for long-term success in driving user engagement and revenue growth in the food and drink category.

Appendix

SQL Queries

Query to get user-level analysis dataset:

https://bit.ly/3JNdlIN

Query for Novelty Effect:

https://bit.ly/43lPKFY

Google sheet link:

https://rb.gy/zb55x

Tableau link:

https://rb.gy/nzocq

Tableau Dashboard link:

https://rb.gy/o66em

PowerPoint link:

https://rb.gy/wpwkm

https://bit.ly/3PNQjW4