Impact of Descriptive Dishes on Food Selection Preferences

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Abstract:

This study aimed to investigate the effect of descriptive naming of dishes on food choice behavior. A randomized controlled trial was conducted with 231 participants who were assigned to either a control group or a treatment group. Both groups were presented with a set of 10 menu cards featuring various food items, and the only difference between the two groups was the absence of one descriptive item per menu card in the control group. Results indicated that hunger levels had no significant effect on food choices, with individuals tending to select more descriptive dishes when experiencing higher levels of hunger. Furthermore, the presence of descriptive names on menu items had a significant impact on food selection, with participants in the treatment group showing a preference for dishes with descriptive names. These findings provide valuable insights for restaurant owners and marketers in designing menus to enhance customer satisfaction and drive sales.

Introduction:

Understanding consumer behavior in choosing food items from a menu is essential for restaurant owners and marketers to optimize their offerings. Factors such as hunger levels and descriptive naming of dishes can significantly influence food choices. In this study, we conducted an A/B test to explore how hunger levels, ranging from 1 to 5, may impact individuals across different age groups in selecting more descriptive dishes from a menu. The experiment was designed to evaluate whether adding descriptive names to menu items would influence food choices, taking into account various demographic factors such as age and gender.

Null Hypothesis:

Having Descriptive dish names on a restaurant menu card does not influence food choice behavior.

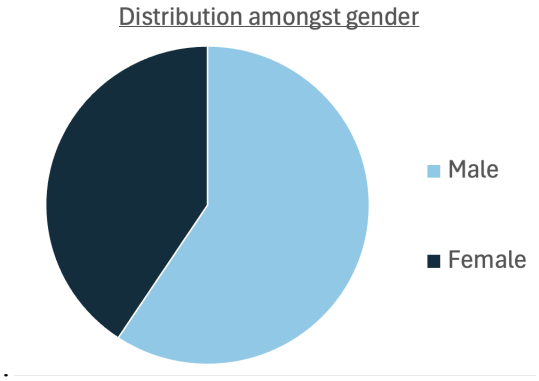
Methodology:

In the treatment group, one dish on each menu card was given a more descriptive name. Participants were asked to indicate their hunger level on a scale of 1 to 5 and select food items from the menu. Additionally, an attention check question was included in the survey to ensure participants' engagement.

Procedure:

We utilized the Qualtrics platform to conduct our survey, which randomized our surveyors and contained inquiries regarding participants' gender, age, and hunger level – our designated covariate. Upon allocation to their respective groups, participants were presented with a series of 11 distinct menu cards, each representing various culinary categories such as starters, soups,

salads, acai bowls, sandwiches/wraps, pizzas, pastas, noodles, coffees, desserts, and cocktails- serving as an attention check question.
In the control condition, participants viewed menus with standard dish names, while those in the treatment group were exposed to menus featuring one dish per menu card with enhanced, more descriptive names. Our participant pool consisted of 233 individuals sourced from diverse channels including Boston University student networks, acquaintances, family members, and social media platforms.



141 Males and 92 Females

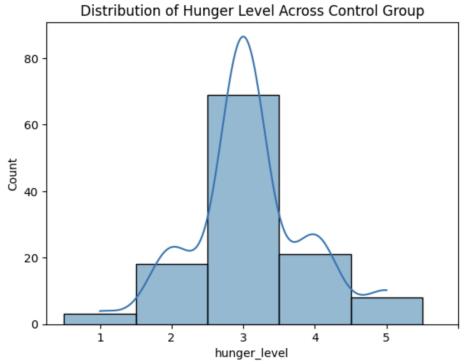
Pre- experiment randomization check:

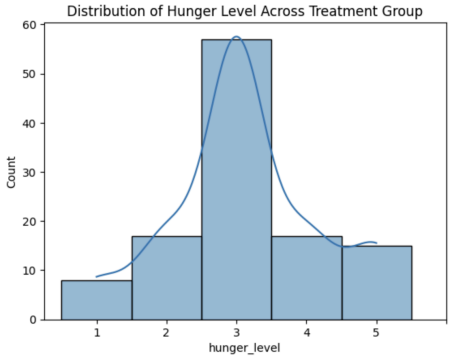
We performed a proportions z-test to assess whether the randomization between the treatment and control groups was conducted properly. In relation to our topic of analyzing the impact of descriptive dish names on food selection preferences, ensuring proper randomization is crucial. It ensures that any differences observed between the treatment and control groups can be attributed to the presence or absence of descriptive dish names, rather than biases introduced by improper randomization. This randomization check helps validate the integrity of your experimental design and the subsequent analysis of results.

1. Counting Observations: The first step is to count the number of individuals in each group. This ensures we have the actual numbers to work with.
2. Setting Expected Proportion: The expected proportion was set to 0.5, which means there is an equal distribution of individuals between the treatment and control groups. This is because in a well-conducted randomization process, we expect both groups to have roughly the same number of participants.
3. Performing the Proportions Z-test: The proportions_ztest function calculates a z-test statistic and p-value based on the observed counts and the expected proportion. This test determines whether the observed proportions significantly differ from the expected proportion (0.5 in this case).
4. Interpretation: Based on the results we obtained from the proportions z-test, with a z-statistic of -0.775 and a p-value of 0.4380, we fail to reject the null hypothesis. The distribution of participants between the two groups appears to be consistent with what would be expected under randomization. This strengthens the validity of your

experimental design and the subsequent analysis of the impact of descriptive dish names on food selection preferences.

Experimental Design: The study employed an A/B testing approach, with participants randomly assigned to either a control group or a treatment group. The control group received menu cards without descriptive names for one randomly selected dish (from several dishes) on each card, while the treatment group received menu cards with one dish on each card featuring a more descriptive name and the rest dishes with the normal name.





Data Analysis

Co-Variate: Hunger Levels

Overall score:

At the culmination of our survey, respondents were given an overall score, ranging from 1 to 10, reflecting their options chosen correctly. In analyzing the outcomes, a nuanced interpretation arises. For the control group, individuals who opted for dishes that were later made descriptive for the treatment group could suggest a degree of indifference toward descriptive names. However, this assumption remains speculative since they were not directly exposed to the descriptive labels. Alternatively, their selection of these items could mean descriptors could signal a genuine preference for those particular offerings, irrespective of naming conventions.

In contrast, the treatment group's scoring methodology offered more concrete evidence supporting the appeal of descriptive food items. Participants were awarded points if they chose dishes adorned with descriptive names, thus underscoring a preference for these enticing labels. Furthermore, our analysis delved deeper, considering respondents' hunger levels in tandem with their menu choices and subsequent scores. This deeper examination sought to discern whether heightened hunger levels correlated with an increased propensity to select descriptive food items, potentially influencing their overall satisfaction ratings. Such holistic scrutiny provides invaluable insights into the interplay between hunger, menu preferences, and overall satisfaction, shedding light on the multifaceted dynamics guiding consumer behavior in culinary decision-making.

Regression Analysis:

The treatment variable represents the effect of the descriptive naming of dishes on the overall score. Looking at the control group, where the descriptive names were absent, people would have chosen the right dishes only 0.5 times. In the treatment Group when people were exposed to the descriptive names, they would choose that dish (1.381+0.496) 1.877 times.

The R-squared value (0.290) shows the proportion of variance in the 'overall_score' (dependent variable) explained by the treatment (independent variable). It suggests that approximately 29% of the variation in overall score can be explained by the presence of descriptive naming of dishes.

	Dependent variable: overall_score
	(1)
Intercept	0.496***
	(0.099)
treatment	1.381***
	(0.141)
Observations	233
R^2	0.293
Adjusted R^2	0.290
Residual Std. Error	1.077 (df=231)
F Statistic	95.755*** (df=1; 231)
Note:	*p<0.1; **p<0.05; ***p<0.01

Regression with Covariates:

For this regression analysis, we chose hunger level as a covariate. Hunger level can be a confounding variable that influences food choice behavior. By this, we can isolate the impact of the descriptive naming of dishes on food choice behavior more accurately. Participants' hunger levels may vary across individuals and may influence their responses to the survey. By accounting for hunger level as a covariate, we can mitigate potential bias in the estimation of the effect of descriptive naming of dishes on the overall score.

The coefficients for hunger levels 2, 3, 4, and 5 represent the effect of each hunger level category relative to the reference category (hunger level 1). None of the coefficients for hunger levels are statistically significant at conventional levels, suggesting that hunger levels may not have a significant effect on overall scores in this analysis.

The coefficients for hunger levels do not show statistically significant effects on overall scores, suggesting that hunger levels may not play a significant role in determining food choices in this study. However, the coefficient for the treatment variable remains statistically significant, indicating that the presence of descriptive names on menu items significantly increases overall scores. The R-squared and adjusted R-squared values have slightly increased adding a covariate.

Overall, the study findings suggest that descriptive naming of dishes has a significant impact on food choice behavior, while hunger levels do not significantly influence overall scores. These insights are valuable for restaurant owners and marketers in designing menus to enhance customer satisfaction and drive sales.

	Dependent variable: overall_score
	(1)
Intercept	0.264
	(0.240)
hunger_level[T.2]	0.234
	(0.295)
hunger_level[T.3]	0.180
	(0.241)
hunger_level[T.4]	0.405
	(0.360)
hunger_level[T.5]	0.310
	(0.321)
treatment	1.387***
	(0.150)
Observations	233
R^2	0.299
Adjusted R^2	0.283
Residual Std. Error	1.082 (df=227)
F Statistic	20.526*** (df=5; 227)
Note:	*p<0.1; **p<0.05; ***p<0.01

Conditional Average Treatment Effect:

We explored the conditional impact of descriptive names on menu choices, specifically focusing on two distinct age groups: 18-23 and 24 and above. Our objective was to understand whether the treatment effect varied significantly across these age cohorts.

For the 18-23 age group:
Participants, on average, choose the correct dishes 0.566 times.
When exposed to descriptive names, participants chose the correct dish 1.681 times (1.115 + 0.566).
The treatment effect estimate (CATE) was 1.115, indicating an additional 1.115 increase in scores compared to the control group.

	Dependent variable: overall_score
	(1)
Intercept	0.566***
	(0.122)
treatment	1.115***
	(0.178)
Observations	100
R^2	0.286
Adjusted R^2	0.279
Residual Std. Error	0.888 (df=98)
F Statistic	39.283*** (df=1; 98)
Note:	*p<0.1; **p<0.05; ***p<0.01

For the 24 and above age group:
Participants, on average, choose the right dishes 0.43 times.
When exposed to descriptive names, participants chose the dish 2.015 times (1.576 + 0.439) on average.
The highest treatment effect estimate (CATE) of 1.576 units was observed in this group.

	Dependent variable: overall_score
	(1)
Intercept	0.439***
	(0.147)
treatment	1.576***
	(0.207)
Observations	133
R^2	0.306
Adjusted R^2	0.301
Residual Std. Error	1.196 (df=131)
F Statistic	57.741*** (df=1; 131)
Note:	*p<0.1; **p<0.05; ***p<0.01

Power Analysis:

Based on the business experiment investigating food choices and descriptions, we find compelling evidence supporting the impact of manipulating food descriptions on customers' choices. The experiment revealed a substantial effect size, with Cohen's d calculated at 1.1148. This large effect size suggests a significant difference between the treatment and control groups regarding the overall score of food items.
Furthermore, the experiment demonstrated high statistical power, with a power of 1.0000. This indicates a high likelihood of correctly detecting true effects, affirming the experiment's robustness in detecting differences between the treatment and control conditions.

Limitations:

The experiment yields valuable insights into the influence of descriptive dish names on food choice behavior. However, it's crucial to recognize several limitations inherent in the study's design and methodology.

The controlled experimental setting may not fully mirror real-world dining environments. Participants' food choices when not in a restaurant setting could diverge from those made in any other settings due to factors like social norms, peer influence, and sensory cues.

Furthermore, the study's focus solely on the impact of descriptive dish names overlooks other potential influences on food choice behavior, such as pricing, portion size, and visual presentation. Ignoring these additional factors limits the comprehensiveness of the analysis and overlooks important determinants of consumer decision-making in restaurant settings.

Additionally, the short-term nature of the experiment may preclude a thorough understanding of sustained effects on consumer behavior over time. Longitudinal studies or follow-up assessments could provide deeper insights into customer behavioral patterns.

While an attention check question was included to ensure participant engagement, its efficacy in maintaining respondents' attentiveness throughout the experiment remains uncertain since all the questions in the survey followed a similar pattern and the attention check question went unnoticed by the person taking the survey.

Acknowledging these limitations is essential for interpreting the study findings accurately. Addressing these constraints in future research can lead to more comprehensive insights into the complex dynamics of food choice behavior and inform more effective strategies for menu design and marketing in the restaurant industry.

Future Scope and Business Applications:

The findings from this study offer promising avenues for future research and practical applications within the food industry. Firstly, future studies could explore the long-term effects of descriptive naming on consumer behavior, including repeat patronage and brand loyalty. Understanding how descriptive names impact customer perceptions and purchasing decisions over time can provide valuable insights for restaurant owners and marketers looking to build sustainable customer relationships.

Moreover, researchers could investigate the influence of other contextual factors, such as menu design, pricing strategies, and environmental cues, in conjunction with descriptive naming. By examining the interplay between these elements, researchers can uncover nuanced insights into how restaurants can optimize their menu offerings to maximize customer engagement and satisfaction.From a business perspective, the study's findings hold several practical implications for restaurant owners and marketers. Firstly, implementing menu engineering strategies that incorporate descriptive names for select dishes can serve as a powerful tool for driving sales and revenue. By strategically highlighting key ingredients, flavor profiles, and culinary techniques, restaurants can create a more immersive and enticing dining experience for their customers.

Furthermore, leveraging descriptive naming in marketing and promotional efforts can help restaurants differentiate themselves from competitors and attract new customers. Through targeted advertising campaigns, social media engagement, and in-store promotions, restaurants can showcase their unique menu offerings and create buzz around featured dishes with descriptive names.

Additionally, the study underscores the importance of customer feedback and iteration in menu development and optimization. By soliciting feedback from patrons regarding their preferences for descriptive names and menu offerings, restaurants can continuously refine their menu descriptions to better align with customer expectations and preferences.

Overall, the study's findings offer actionable insights for restaurant owners and marketers seeking to enhance their menu offerings, attract new customers, and drive business growth in an increasingly competitive market landscape. By capitalizing on the power of descriptive naming, restaurants can create memorable dining experiences that resonate with customers and foster long-term loyalty and success.

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