Impact of Displaying Calorie Information on Menus: A Causal Experiment

BA 830 Final Project

QUESTROM SCHOOL OF BUSINESS

OUR TEAM

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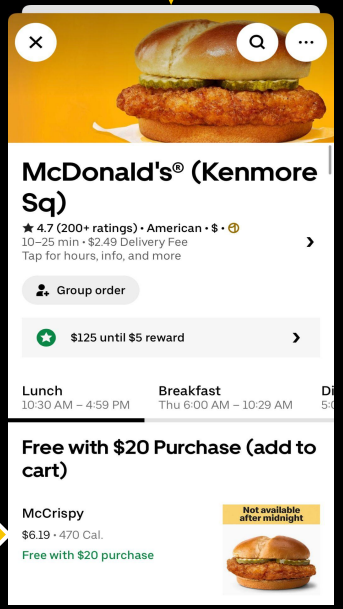
Background

Chipotle

McDonald's



Subway

FDA: Menu labeling rule effective May 7, 2018 for chain restaurants with 20+ locations to disclose calorie and nutrition info.

Research Question

Does the presence of calorie information on a restaurant's menu affect consumer food choices?

Hypothesis

The inclusion of calorie information on restaurant menus would lead consumers to choose lower-calorie food options.

Treatment & Experimental Design

Within-subject design

- 2 menus shown to each participant
- Compare each participant's food choices before and after treatment

Treatment

- The treatment menu displayed the calorie count for each food item

Data Collection

- Qualtrics Survey
- Demographic, diet & physical activity questions

Sample Size

- 110 respondents

Outcome

- Calories before vs. after

Control

Menu 1 shown first
without Calorie Info.

Treatment

Menu 2 shown after
with Calorie info.

Data Analysis

Paired T-Test

- Used to Measure: A.T.E & C.A.T.E of gender, heath conscientiousness, & physical activity levels

FEOLS Regression

- Used to validate our results & provide greater insights

Results

-37 Calories

The Average Treatment Effect

Displaying the Calorie count of food items on a menu led to customers ordering items with fewer Calories

-47 Calories

C.A.T.E for Women

Women tended to switch their order more often than men, and ordered less Calories

-174 Calories

C.A.T.E for Health Conscious Individuals

Health conscious individuals switched their order and ordered less Calories

Business Implications

- Displaying Calorie information can be advantageous for restaurants, as lower Calorie foods are more cost-effective*
- Promoting lower Calorie options through menu labeling, restaurants may increase their profits
- A Win - Win!

*Lower-calorie foods cost more per calorie

Limitations & Future Scope

- Relatively small sample size of a similar demographic
- A survey may not be generalizable to results within the field
- Our menu may not be appeasable to all food preferences
- Future Scope: Examining nutritional information displayed on food choice

Questions?

APPENDIX

```r
t.test(calorie_unaware$calorie_2, calorie_unaware$calorie_1,
alternative = "less", paired = TRUE)
```

```
        Paired t-test

data:  calorie_unaware$calorie_2 and calorie_unaware$calorie_1
t = 1.35394, df = 75, p-value = 0.91009
alternative hypothesis: true mean difference is less than 0
95 percent confidence interval:
      -Inf 56.338271
sample estimates:
mean difference
      25.263158
```

```r
t.test(men$calorie_2, men$calorie_1, alternative = "less", paired = TRUE)
```

```
        Paired t-test

data:  men$calorie_2 and men$calorie_1
t = -1.33582, df = 58, p-value = 0.093413
alternative hypothesis: true mean difference is less than 0
95 percent confidence interval:
      -Inf 11.118132
sample estimates:
mean difference
     -44.237288
```

```r
t.test(women$calorie_2, women$calorie_1, alternative = "less", paired = TRUE)
```

```
        Paired t-test

data:  women$calorie_2 and women$calorie_1
t = -2.25062, df = 48, p-value = 0.014514
alternative hypothesis: true mean difference is less than 0
95 percent confidence interval:
       -Inf -11.802654
sample estimates:
mean difference
     -46.326531
```

```r
t.test(exercise$calorie_2, exercise$calorie_1, alternative =
"less", paired = TRUE)
```

```
        Paired t-test

data:  exercise$calorie_2 and exercise$calorie_1
t = -1.57485, df = 105, p-value = 0.05915
alternative hypothesis: true mean difference is less than 0
95 percent confidence interval:
      -Inf 1.9217784
sample estimates:
mean difference
     -35.754717
```

```r
t.test(survey$calorie_2, survey$calorie_1, alternative = "less",
       paired = TRUE)
```

```
        Paired t-test

data:  survey$calorie_2 and survey$calorie_1
t = -1.6611, df = 109, p-value = 0.049784
alternative hypothesis: true mean difference is less than 0
95 percent confidence interval:
         -Inf -0.047119604
sample estimates:
mean difference
     -36.454545
```

```r
pwr.t.test(n = length(survey$calorie_1), d = cohen_d, sig.level = .05, power = NULL)
```

```
     Two-sample t test power calculation

              n = 110
              d = 0.047614066
      sig.level = 0.05
          power = 0.064275521
    alternative = two.sided

 NOTE: n is number in *each* group
```

```r
pwr.t.test(n = NULL, d = cohen_d, sig.level = .05, power = 0.7)
```

```
     Two-sample t test power calculation

              n = 5445.8073
              d = 0.047614066
      sig.level = 0.05
          power = 0.7
    alternative = two.sided

 NOTE: n is number in *each* group
```

```r
t.test(calorie_aware$calorie_2, calorie_aware$calorie_1,
alternative = "less", paired = TRUE)
```

```
        Paired t-test

data:  calorie_aware$calorie_2 and calorie_aware$calorie_1
t = -3.45838, df = 33, p-value = 0.00075902
alternative hypothesis: true mean difference is less than 0
95 percent confidence interval:
       -Inf -89.063271
sample estimates:
mean difference
     -174.41176
```