FISHER COLLEGE OF BUINSESS – HONORS THESIS IN MARKETING

Examining the "No-Choice" Option in Choice-Based Conjoint Analysis

Maggie Chwalek, Advisors: Dr. Greg Allenby and Dr. Roger Bailey

INTRODUCTION

Choice-Based Conjoint analysis (CBC) is a method used to determine how individual consumers value attributes of a product or service. The consumer selects the option he or she would be most likely to purchase among those presented, which includes a "no-choice" option. The "no-choice" option is an alternative within a CBC analysis that allows consumers to decide against purchasing any of the presented options. This no-choice option is necessary in order to correctly simulate real choices, but could be problematic if each consumer perceives this option differently. This research examines the effect of building a more consistent interpretation of the no-choice option across participants in a CBC study. The goal of this research is to provide a recommendation for how to improve the consistency of choices in CBC analysis.

Which one of these whitening products would you like to choose?

	Option A	Option B	Option C	I would not choose any of these.
Brand	GO SMILE	LUSTER	Crest	
Form	Trays + Gel	Light Technology	Strips	
Time for One Treatment	25 minutes	5 minutes	25 minutes	
Number of Treatments	21	7	21	
Time to Results	14 days	7 days	14 days	
Percent Peroxide	13%	10%	8%	
Price	$44.99	$54.99	$24.99	-

	Option A	Option B	Option C	I would not choose any of these.
Which would you like to choose?	○	○	○	○

Choice Task Design

Image taken from survey created using Qualtrics, choice task created using Sawtooth software. Survey participants were shown 12 discrete choice tasks and selected one option among the presented alternatives in each task. Seven attributes varied in level across the 12 choice tasks, simulating the market of products available for purchase.

METHODS

Survey Design

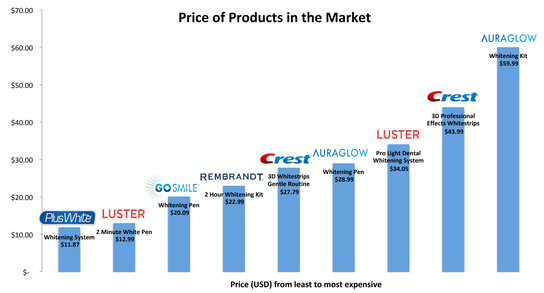
The teeth whitening product market was used in the survey to test the effect of different levels of information given to consumers on their choices in the survey. The following attributes of teeth whitening products were used to create 12 choice tasks:

- Brand
- Form
- Time per treatment
- Number of treatments
- Time to results
- Percent peroxide
- Price

Survey Design (continued)

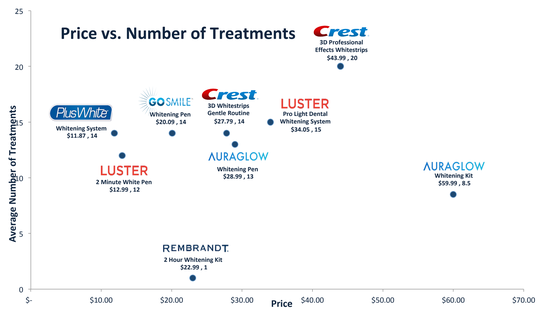
Survey respondents were shown a glossary video prior to engaging in the choice tasks. This video described each of the product attributes which ensures all participants understand what alternatives they are deciding between in the tasks.

Survey respondents were randomly split into three groups with each group receiving a different amount of information about the products in the market. A control group engaged in standard CBC, the first treatment group was shown the prices of products in the market, and a second treatment group was shown the price of products in relation to multiple attributes of the product. Below are samples of the graphs the first and second treatment groups saw before engaging in the choice task questions.



Data Shown for First Treatment Group

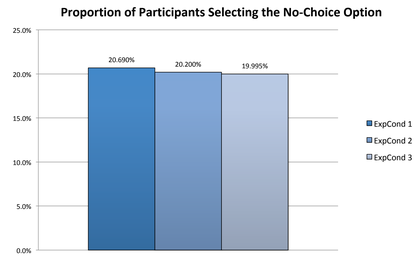
The first treatment group was given the price of products in the market in a one-dimensional bar graph. Price was displayed in ascending order for ease of understanding. Brand and product details were displayed along each product. Survey respondents placed in this group were shown a video explaining how to interpret this data prior to making decisions in the choice tasks.



Data Shown for Second Treatment Group

The second treatment group was given the price of products in the market compared to different attributes of the product in a two-dimensional chart. The graph above shows price vs. number of treatments. Price was also compared against time per treatments, time to results, and percent peroxide. Price is displayed on the x-axis and the attribute value is displayed on the y-axis. Survey respondents placed in this group were also shown a brief video explaining how to interpret this data.

RESULTS



Initial Results Between Experimental Conditions

Initial model-free results show there is no significant differences between the proportion of participants selecting the no-choice option among the three experimental groups.

Hierarchical Multinomial Logit Model:

Lower Level

Latent Value | Attributes | Individual Coefficients | Error

$$V_{jh} = X_j \beta_h + \varepsilon_{jh}$$

Decision Rule

Respondent ***h*** selects the ***j*** alternative with the greatest ***V***

Upper Level

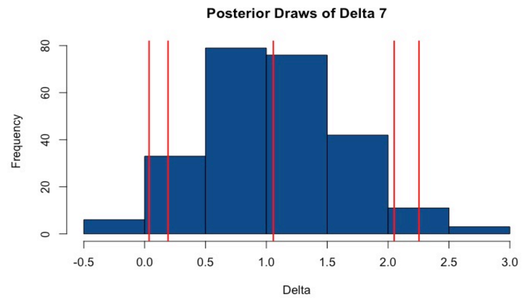
Individual Coefficient | Upper Level Coefficients | Cond. 2 Dummy | Cond. 3 Dummy | Error

$$\beta_{ih} = \delta_{i1} + \delta_{i2} z_{2h} + \delta_{i3} z_{3h} + \zeta_{jh}$$

Fitting the Model

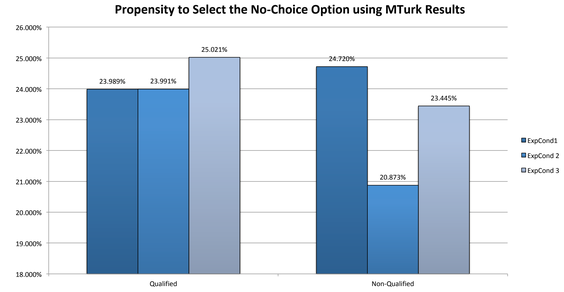
The model was estimated using Markov Chain Monte Carlo (MCMC), and the posterior distribution for each parameter was compared across experimental conditions. Significant differences were found in the three attributes:

- Attribute 7: Pen (form)
- Attribute 8: Trays + Gel (form)
- Attribute 11: 25 minutes (time per treatment) **marginally significant*



Statistical Significance in $\delta_{7,2}$

Fitting a Hierarchical Bayes model to the data shows statistical significance between the control group and the first treatment group on three attributes. This significance means that the respondents put value on those attributes, based on their selections. The previous graph shows the statistical significance between the control and first treatment group on attribute 7 (pen).



Qualified vs. Non-Qualified Propensity to Select No-Choice Option

Given more information about the market, non-qualified survey respondents were less likely to choose the outside good. This suggests that individuals who are informed and interested in the market do not change their perspective of the no-choice option given more information, as shown in the initial descriptive results.

CONCLUSION

The results from fitting the model to our data show statistically significant differences in the upper level coefficients for three variables in the first treatment group. Participants in this group value products more given they have these attributes. The lack of differences in the descriptive analysis using SSI data suggests that CBC is a robust method to value attributes of a product. While participants placed in the control group were given no market information, the results of the study showed little differences of outcomes between all three groups. Analyzing the results from non-qualified survey respondents shows the additional price data informs consumers about the market and gives them a lower propensity to select the no-choice option.

REFERENCES

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