When the marketplace seems too big: Using evoked sets to model how shoppers buy

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Conjoint analysis used to understand tradeoffs

- Many shopper decisions involve tradeoffs
- Conjoint analysis can be used to understand and predict how shoppers will make tradeoffs

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Some tradeoffs occur in a large competitive space

- A Grocery Store may have hundreds of SKUs relevant to your category
- We can program realistic shelf sets where we vary prices and products to understand tradeoffs
- But a computer screen is not a store

What if we have too many products to show on a computer screen?

Evoked sets can help when you have a large market space

- Most shoppers make tradeoffs between a smaller set of products in their consideration set
- For each respondent, we can customize the conjoint screen to show only those products that are relevant to them

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Additional Reasons to Use Evoked Set

Easier for respondent to focus

Survey seems more relevant

Respondent more engaged

Better data quality

How do we customize the products shown?

Ask respondents to tell us what products are relevant to them

Past behavior

Future behavior

Required Features / Unacceptable Features

Multiple screening criteria to avoid eliminating items hastily

Custom shelf sets require programming expertise

Evoked from multiple screening criteria

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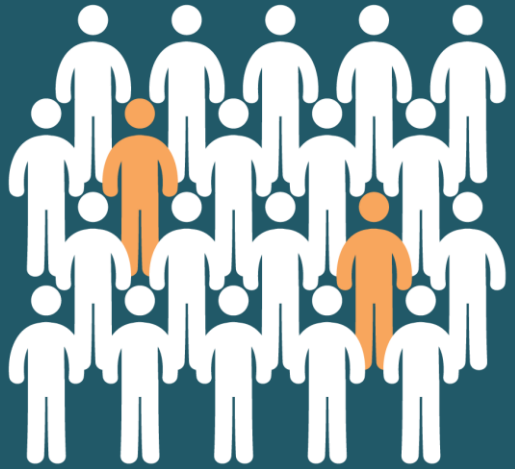
Rules apply

Random non-evoked products

Customized but Structured and Meaningful Shelf Set

Disadvantages of Evoked Set

We may be eliminating some products the respondent would buy



Introduces “Selection Bias” must do more complex modeling to account for this

Evoked Sets Require Analytical Expertise

1) Selection Bias

Most mathematical models assume this missing data is missing at random

Raw conjoint data only shows that a respondent was not shown certain items

Need to inform our predictive model that missing means “undesirable”

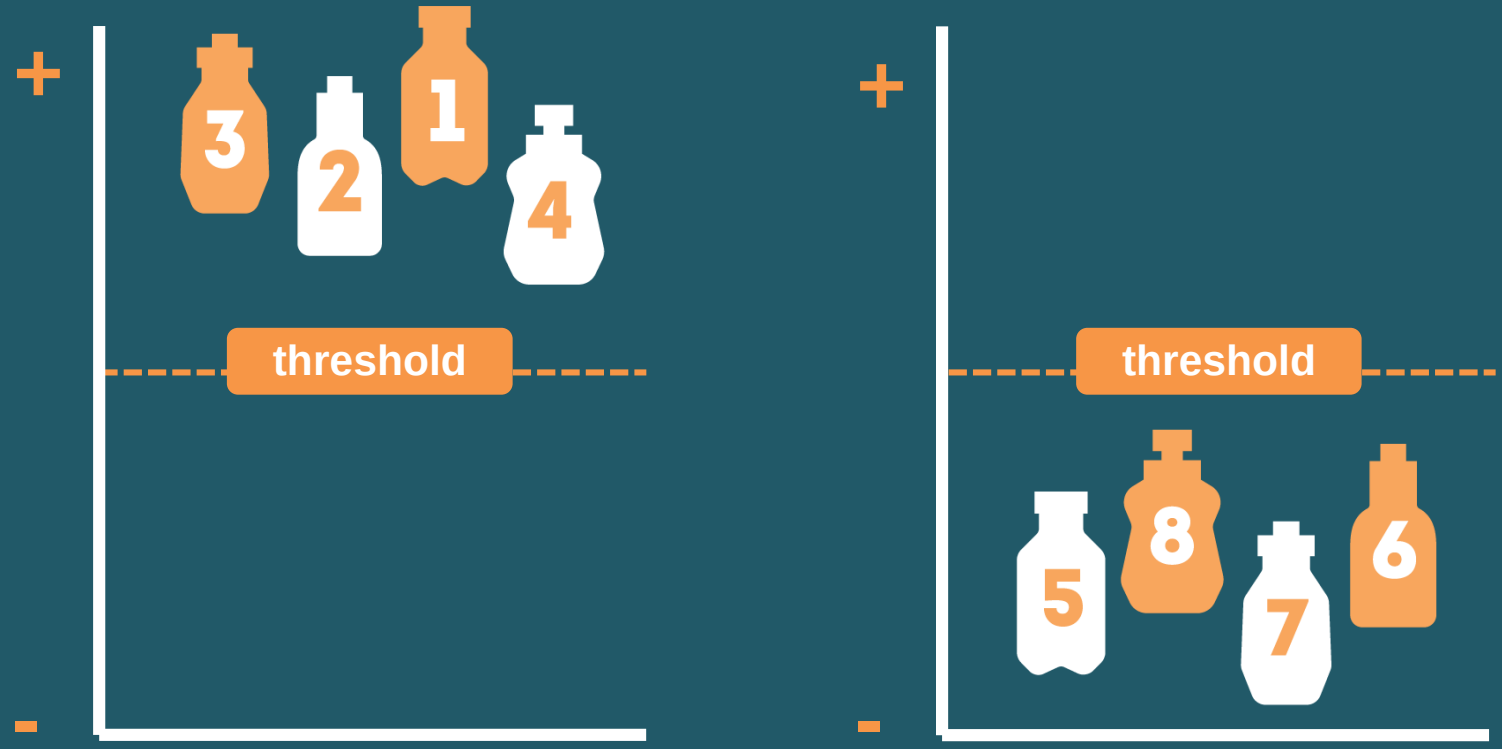
A. Add Synthetic Data

1. Add non-evoked items to model (not picked)
2. Define Threshold
   - > Evoked products beat a threshold
   - > Other products lose to threshold

B. Respondent Level Penalized Regression

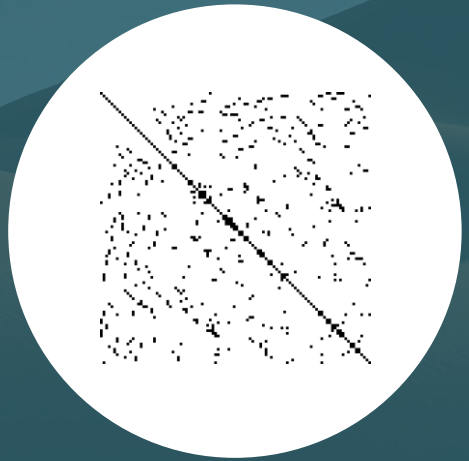
- > Individual level constraints
- > Can set predictions at 0

Explanation of threshold

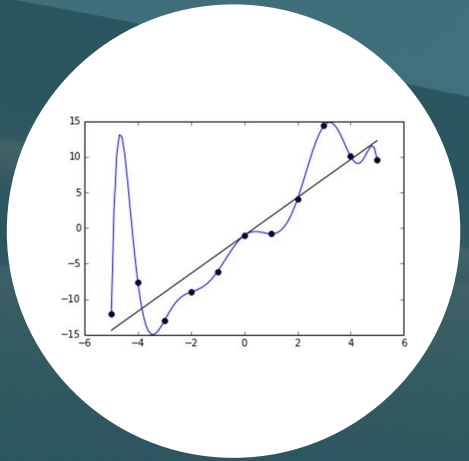


Evoked Sets Require Analytical Expertise

2) Large Marketplace Means Sparsity of Data



Sparsity

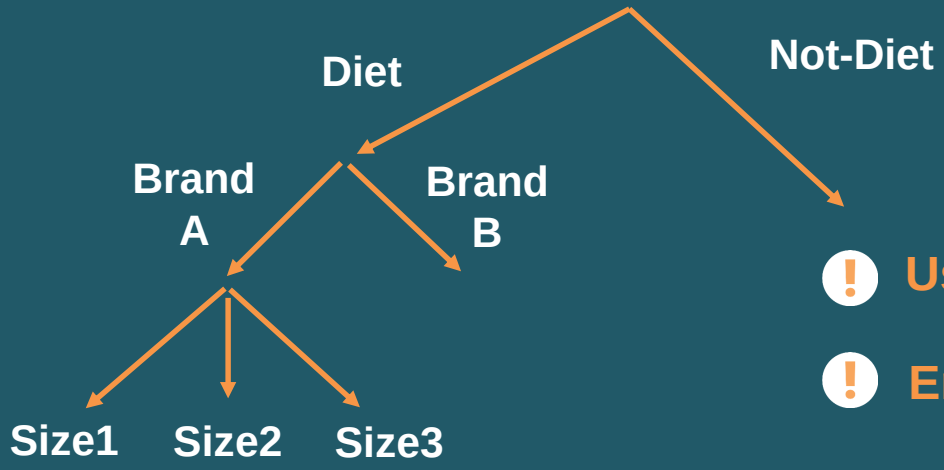


Easy to overfit
the data

Calibrate/Tune
model for sparsity

Evoked Sets Require Analytical Expertise

3) Large Marketplace Typically Has Nesting Structure



- Use Nested Logit or similar approach
- Ensembles of Different Nests

Some items are grouped together as more similar to each other more likely to choose between these

Conclusion

Evoked Sets Enable Us to Study a Large Marketplace of Products

> Survey customized to respondent

> More engaged respondents

> Requires programming expertise

Evoked Sets Require Careful Screening

> Adding other products to evoked set is recommended

Evoked Sets Require Analytical Expertise

> Solutions to Selection Bias

> Calibrate for Data Sparsity

> Model Natural Groupings or Nests

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