



# Consumer Insight Consultants

Line Optimization

# Topics for Line Optimization

- Some Background
  - When to Use
  - EMS Principles
- Data Collection
  - Ratings
  - Select & Rank
  - Conjoint/Discrete Choice/Maxdiff
  - Internal/secondary data
- Analytics
  - TURF
  - Line Share
  - Shapley value
  - Clusters and Charts



When do I need Line Optimization?  
EMS principles

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# Some Background

# When Line Optimization?

Store Shelf Space  
is Limited

Line Extensions

Reduce  
Manufacturing  
Complexity

Claim/Messaging  
Optimization

Bundling  
(sometimes)

# EMS Principles

## Multiple Lenses

All techniques have strengths and weaknesses. It's important to know what they are and then use the best ones.

Because no technique is perfect, a mix of approaches (ensemble) is almost always best

## Best Statistics $\neq$ Best Solution

With line optimization, non-consumer factors like cost and retailer constraints must also be considered

## Competitive Context

What your competitors are doing matters, so they should be included in all analyses



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# Data Collection

# Survey Approaches\*

Rating Scale

Select & Rank

Conjoint/  
Discrete Choice/  
Maxdiff

\*Can also use transaction data

# Select & Rank

For the **Select and Rank** approach we show a list of potential “flavors”, including a full listing of competitors, and ask people to identify which they would consider purchasing.

Among the “flavors” chosen, respondents rank (up to 10) based on how frequently they would purchase each one.

Below are many different flavors and brands of ice cream. Please select those that you would consider buying.

- Brand A – Chocolate
- Brand B - Chocolate
- Brand C - Chocolate
- Brand A – Strawberry
- Brand B – Strawberry
- Brand C - Strawberry
- Brand A – Vanilla
- Brand B - Vanilla
- Brand C - Vanilla

Rankings are converted to share estimates which can be used in a simulator to find the optimal lineup.

You selected the items below as brands/flavors you might consider buying.

Now, please rank them, where 1 is the one you would buy most often, 2 is the one you would buy next most often, and so on (this is capped at 10 to keep you sane).

- \_\_\_ Brand B - Vanilla
- \_\_\_ Brand C - Chocolate
- \_\_\_ Brand A – Strawberry
- \_\_\_ Brand B - Vanilla
- \_\_\_ Brand C - Strawberry
- \_\_\_ Brand B – Strawberry
- \_\_\_ Brand A – Vanilla



# Maximum Difference Scaling (Maxdiff)

Of the products shown below, which one would you buy most often, and which one would you buy least often?

Most Often		Least Often
<input type="radio"/>	Variant 12	<input type="radio"/>
<input type="radio"/>	Variant 6	<input type="radio"/>
<input type="radio"/>	Variant 2	<input type="radio"/>
<input type="radio"/>	Variant 10	<input type="radio"/>
<input type="radio"/>	Variant 3	<input type="radio"/>
<input type="radio"/>	Variant 9	<input type="radio"/>

From the data collected scores can be estimated for each individual.



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# Analytics

# Several Analytic Techniques can be Used

TURF

Clusters and  
Charts

Shapley Values

Line Share  
Simulation

# TURF (Total Unduplicated Reach and Frequency) is the most often used approach

- Respondents evaluate a list of items
  - Items can be
    - Flavors
    - Claims
    - Features
  - Data collection is very flexible
    - Maxdiff
    - Ratings
    - Rankings
    - Checklist
- A simulator is used to identify lineups of different sizes that have the most reach. Can also calculate # items liked (frequency) and Shapley value.

Can be more important than reach!

EMS ANALYTICS  
EFFECTIVE MARKETING SOLUTIONS

## TURF Analyzer

Cover Instructions Upload/Simulate **Top Combos** Group Items Map

### Find Top Combinations

Filter: Total Sample

Line Size: 2

Show 10 entries

combo	Reach	Number Liked	Item 1
19	73.9%	1.0680000	0
20	72.7%	1.0473333	0
15	72.7%	0.9800000	0
14	72%	1.0013333	0
3	71.8%	0.9786667	1
22	71.8%	0.9646667	0
10	71.7%	0.9193333	0
23	71.6%	1.0260000	0
25	71.3%	0.9433333	0
4	71.3%	0.9573333	1

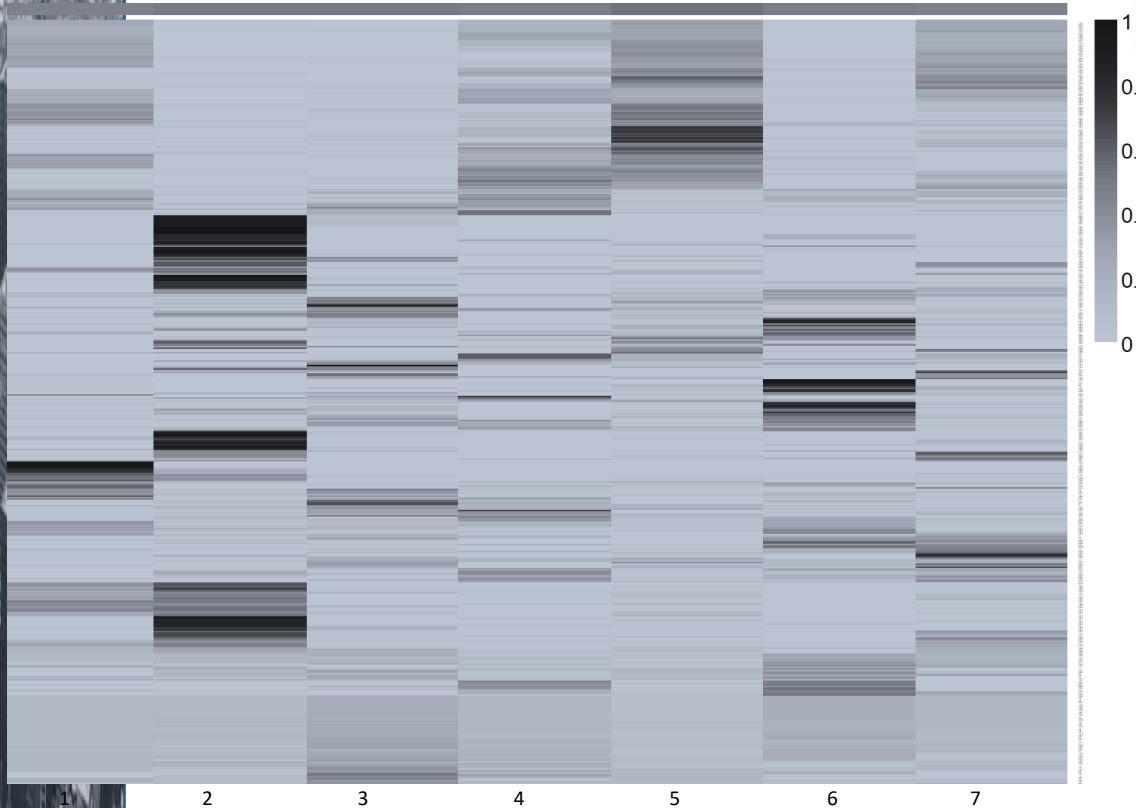
Showing 1 to 10 of 28 entries

Download File

# NMF - Respondents and Items can be Grouped Simultaneously

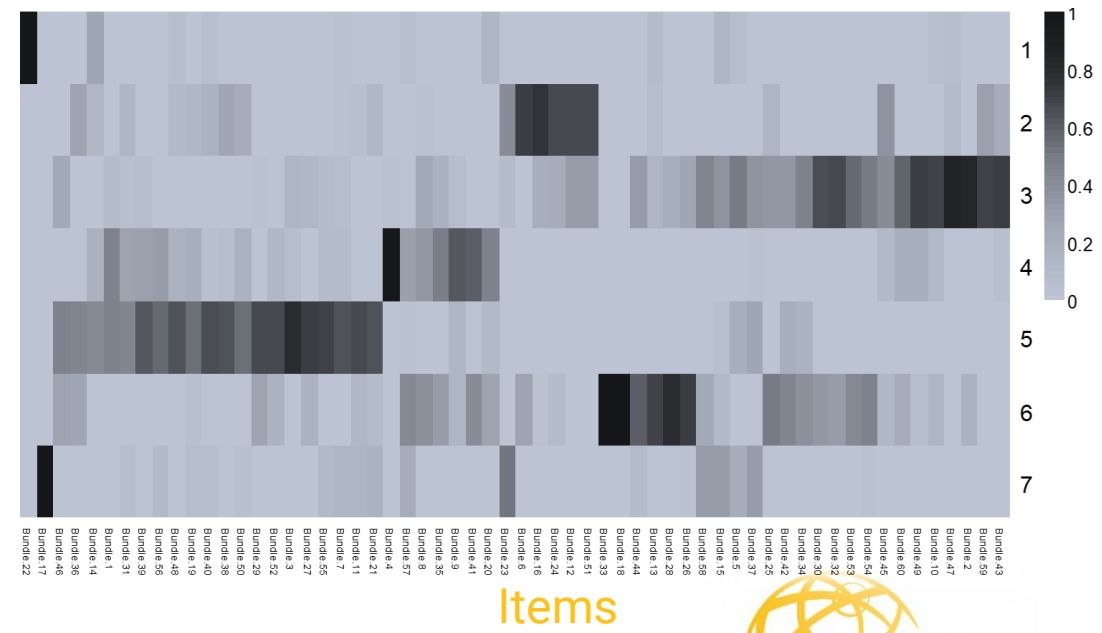
Respondent Distribution across Seven Components

Respondents



In this example, we identified 7 groups of items that were “liked” by different groups of people. This allows us to identify lines and who those lines appeal to.

Item Distribution across Seven Components



# Shapley Values can also be used

- Uses same data as TURF
- Based on Game Theory construct, measures contribution of each item over all line sizes
- “Combines” reach and item liking/choosing
- More robust lineup for out-of-stock conditions
- Tends to provide lines with lower reach but better overall desirability
- In some cases, Shapley Values can be used to estimate sales proportions

# Select and Rank, an Alternative to Shapley

Select

“Of the following flavors, which ones would you consider purchasing?”



Rank

“Of the flavors you just selected, please rank them in order of how frequently you would buy them over the next year.” {*max 10*}



Outputs

- Run TURF on **Select**
- Grouping based on Select
- Line share simulator on **Rank**

# Line Share Simulator

- If products are very similar (e.g. SKUs only differ in size) and you want to consider the effects of competition, a line share simulator may be a better option.
- Respondents select the items they would consider, then rank (up to 10) items in order of preference or frequency of purchase.
- A power-law heuristic is used to calculate individual-level shares.

**Product Line Simulator**  
 Client: [blank]  
 Study #: Demo  
 Date: Aug-10

EMS ANALYTICS

Full Screen Display | Normal Screen Display  
 Set Filters | Save Current Shares  
 Results by Filter

	Share	O/U Base	In Base Case
<input checked="" type="checkbox"/> Client Brand Small Basic	1.4%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand Small Premium	1.1%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand Small Deluxe	1.2%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand Medium Basic	2.4%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand Medium Premium	2.2%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand Medium Deluxe	2.8%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand Large Basic	1.2%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand Large Premium	0.7%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand Large Deluxe	2.5%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand XL Basic	1.2%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand XL Premium	1.7%	0.0%	✓
<input checked="" type="checkbox"/> Client Brand XL Deluxe	3.6%	0.0%	✓
<input type="checkbox"/> Client Brand Small Basic Variant A	0.0%	0.0%	
<input type="checkbox"/> Client Brand Small Basic Variant B	0.0%	0.0%	
<input type="checkbox"/> Client Brand Small Basic Variant C	0.0%	0.0%	
<input type="checkbox"/> Client Brand Small Basic Variant D	0.0%	0.0%	
<input type="checkbox"/> Client Brand Small Premium Variant A	0.0%	0.0%	
<input type="checkbox"/> Client Brand Small Premium Variant B	0.0%	0.0%	
<input type="checkbox"/> Client Brand Small Premium Variant C	0.0%	0.0%	
<input type="checkbox"/> Client Brand Small Premium Variant D	0.0%	0.0%	
<input type="checkbox"/> Client Brand XS Basic	0.0%	0.0%	
<input type="checkbox"/> Client Brand XS Premium	0.0%	0.0%	
<input type="checkbox"/> Client Brand XS Deluxe	0.0%	0.0%	
<input checked="" type="checkbox"/> Competitor P Medium Deluxe	1.8%	0.0%	✓
<input checked="" type="checkbox"/> Competitor P Large Deluxe	2.4%	0.0%	✓
<input checked="" type="checkbox"/> Competitor P XL Deluxe	2.0%	0.0%	✓
<input checked="" type="checkbox"/> Competitor Q Small Basic	1.2%	0.0%	✓
<input checked="" type="checkbox"/> Competitor Q Medium Basic	0.8%	0.0%	✓
<input checked="" type="checkbox"/> Competitor Q XL Premium	1.0%	0.0%	✓
<input checked="" type="checkbox"/> Competitor Q XL Deluxe	0.6%	0.0%	✓
<input checked="" type="checkbox"/> Competitor Q XL Premium Variant A	0.4%	0.0%	✓
<input checked="" type="checkbox"/> Competitor R Small Deluxe	3.3%	0.0%	✓
<input checked="" type="checkbox"/> Competitor R Medium Deluxe	1.9%	0.0%	✓
<input checked="" type="checkbox"/> Competitor R Large Deluxe	2.8%	0.0%	✓
<input checked="" type="checkbox"/> Competitor R XL Deluxe	1.3%	0.0%	✓

Client line size 12  
 Total Items 56  
 Avg Client Considered 3.1  
 Avg Total Considered 12.6  
 None considered 1.2%

	Share	O/U Base
Client	22.0%	0.0%
Comp. P	6.3%	0.0%
Comp. Q	4.1%	0.0%
Comp. R	14.0%	0.0%
Comp. S	4.6%	0.0%
Comp. T	10.2%	0.0%
Comp. U	37.6%	0.0%
XS	1.4%	0.0%
Small	24.8%	0.0%
Medium	26.2%	0.0%
Large	23.1%	0.0%
XL	23.2%	0.0%
Basic	26.1%	0.0%
Premium	29.3%	0.0%
Deluxe	43.3%	0.0%





**Effective Solutions, Grounded Results**