

Sharpen Your Understanding of a Single Product Leg or Consumer Segment Using Impact, Landscape and Profile Analysis



data&modelingsciences

*Yong Zhang, Ph.D. Michael L. Thompson, Ph.D.
Amy Phillips, Brian Gettelfinger, Ph.D., MBA*

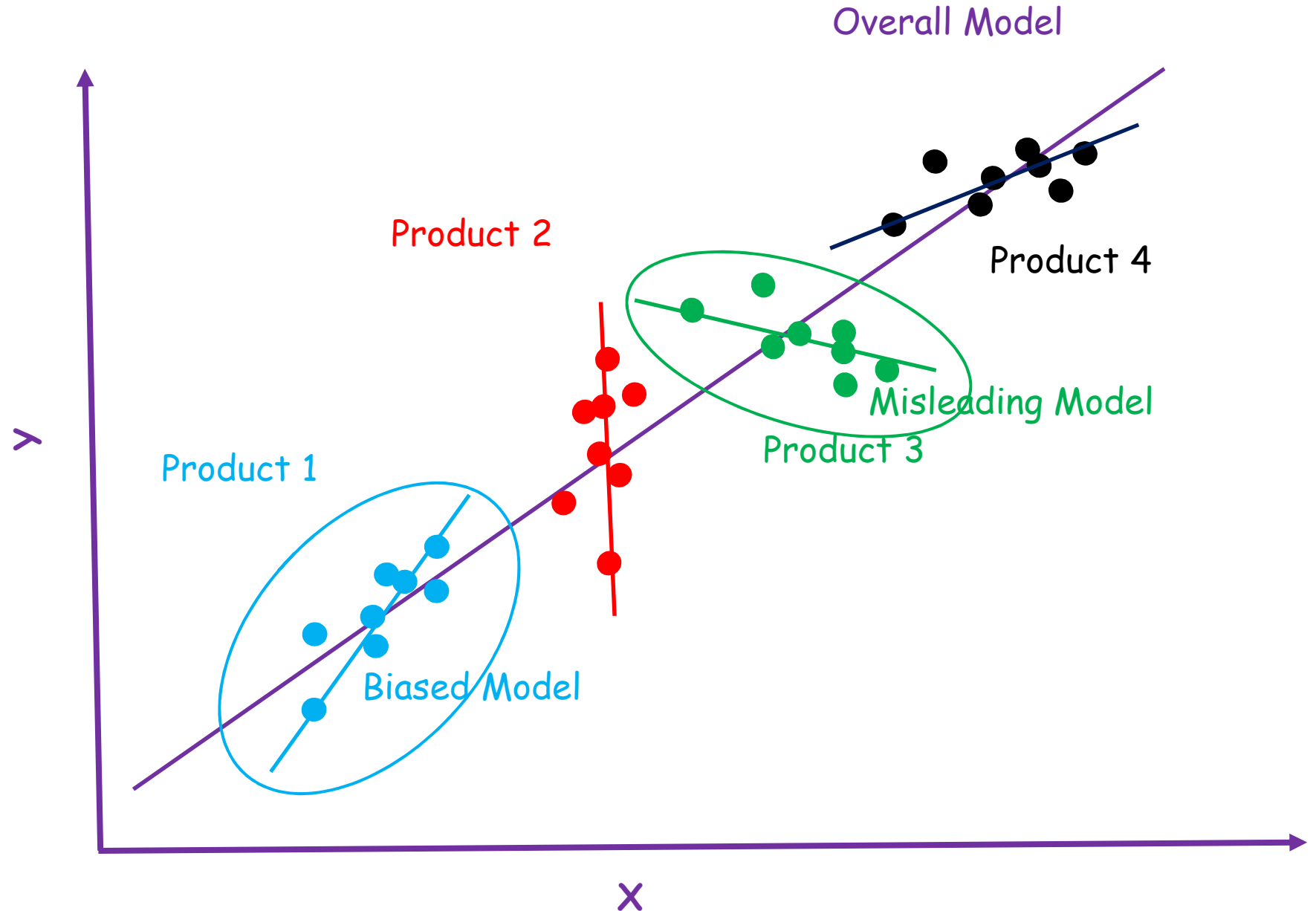
*Procter & Gamble, Corporate Function R&D, DMS
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Outline

- Why you should **NOT** build single product model or small base size model
- How you use **Impact Analysis, Landscape Analysis and Profile Analysis** to sharpen your understanding of a single product leg or consumer segment
- A generic case study, and a quick demo in BayesiaLab if time permitted

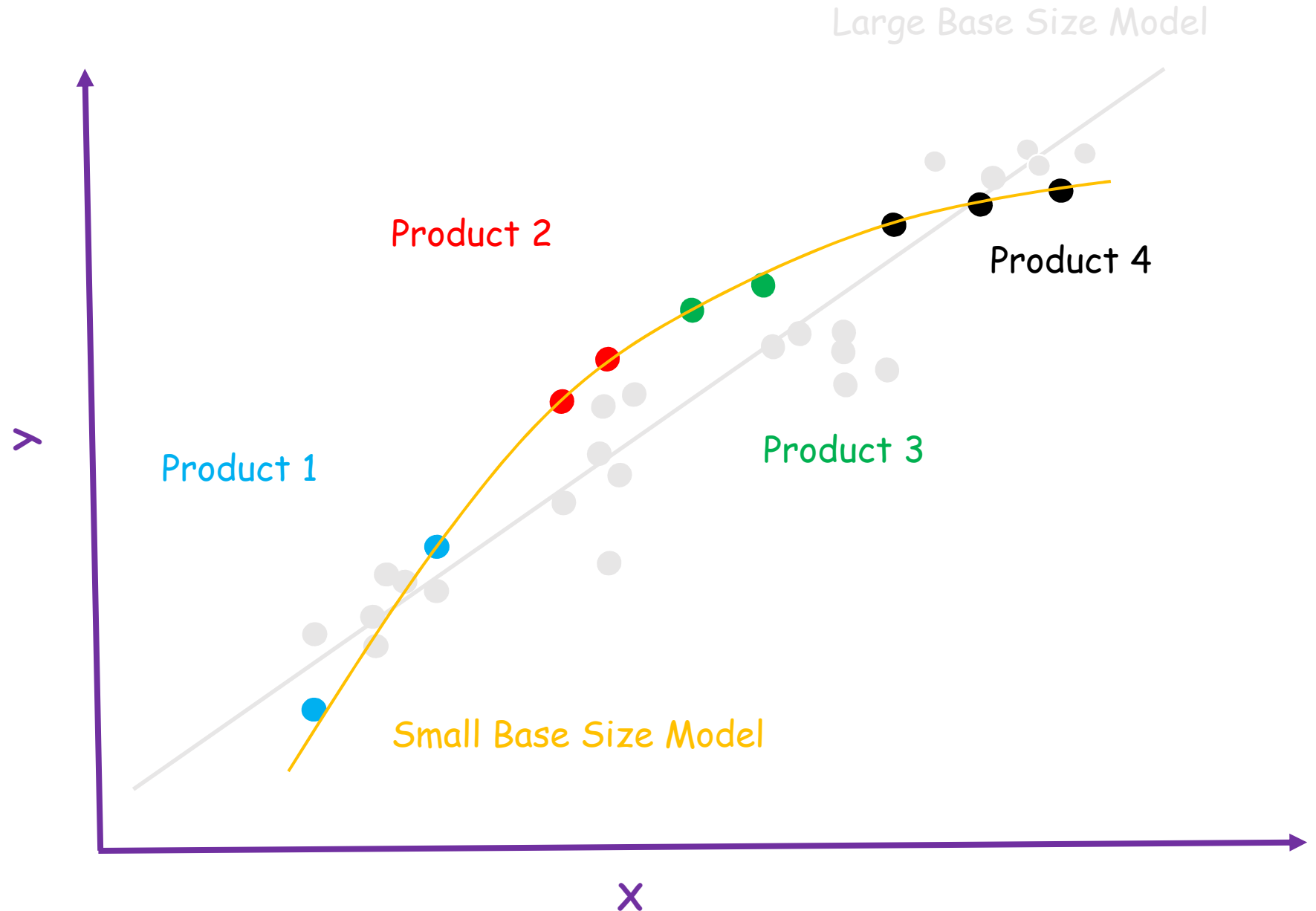
Single Product Leg may give you a biased or even misleading model

- Overall True Model Using All Product Legs If Having Sufficient Base Size
- Biased Model If Only Using Product 1
- Misleading Model if Only Using Product 3



Small base size may also give you a biased or even misleading model

- Large Base Size "True" Model Using All Product Legs with Sufficient Base Size
- You may have a "wrong" model overfitting your data if not having sufficient base size



How to mitigate risk of doing single product or small base size model?

- Analyze single product by “borrowing” information from other product legs or similar studies
- Three methods developed in P&G to handle this issue
- Enabled by three new features in BayesiaLab8.0
 - **Landscape Analysis:** The Landscape Plot provides the overall landscape for a given product category. It shows the purchase drivers of this category and the positions of each product on each driver.
 - **Impact Analysis:** Product Impact Plot singles out a product and compares with the overall category or a benchmark. It shows how a product differentiates itself from overall category or a benchmark and how its benefits and key measures impact a target, such as purchase intent.
 - **Profile Analysis:** Product Profile Plot visualize product legs using all their benefits and key measures. It profiles products with large dimensions of benefits in a two dimensional radar plot.

How to mitigate risk of doing single product or small base size model?

- As compared with product b, what is the impact of benefit i of product a on our target?

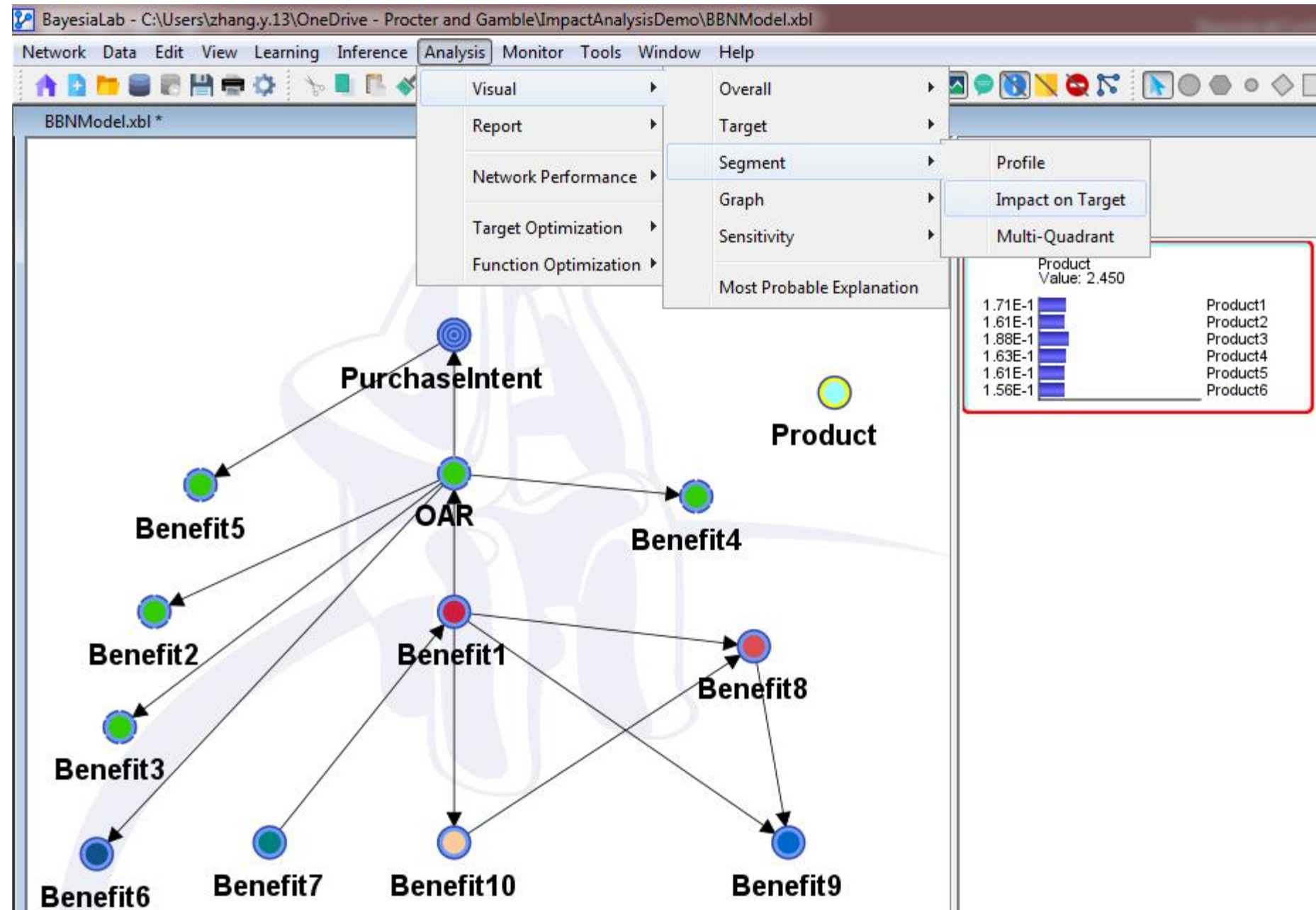
$$I_{a \rightarrow b, i} = (F_{a, i} - F_{b, i}) TE_i = \Delta F_{a \rightarrow b, i} TE_i \approx \Delta Target$$

F_{pi} : average Factor score of single product p on benefit i (usually small base size) ;

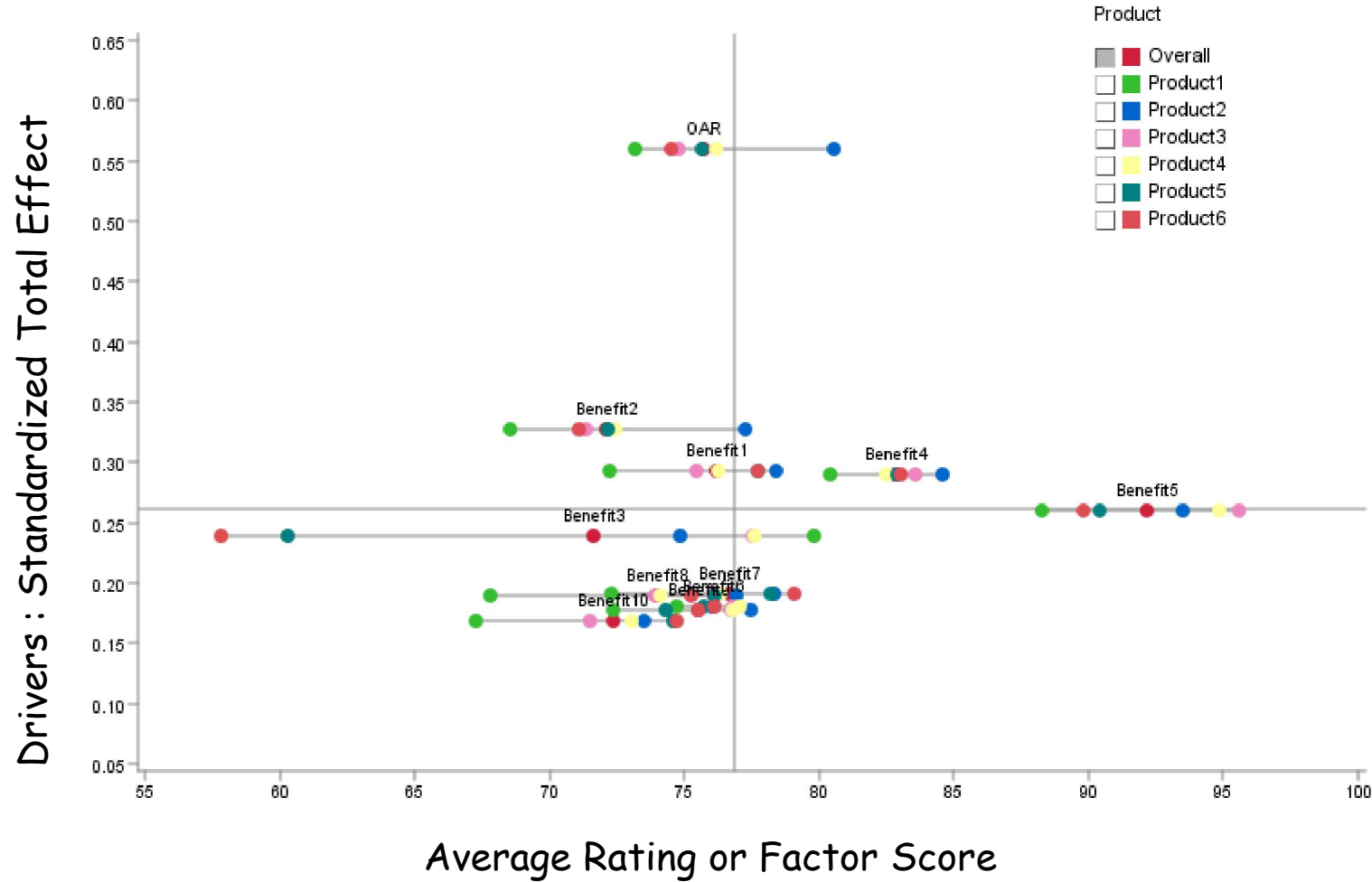
TE_i : Total Effect of benefit i on target according to overall category model (usually large size);

$I_{a \rightarrow b, i}$: average Impact of benefit i of product a on target as compared with product b;

Start Point: Build your BBN model



What's the landscape in this category?

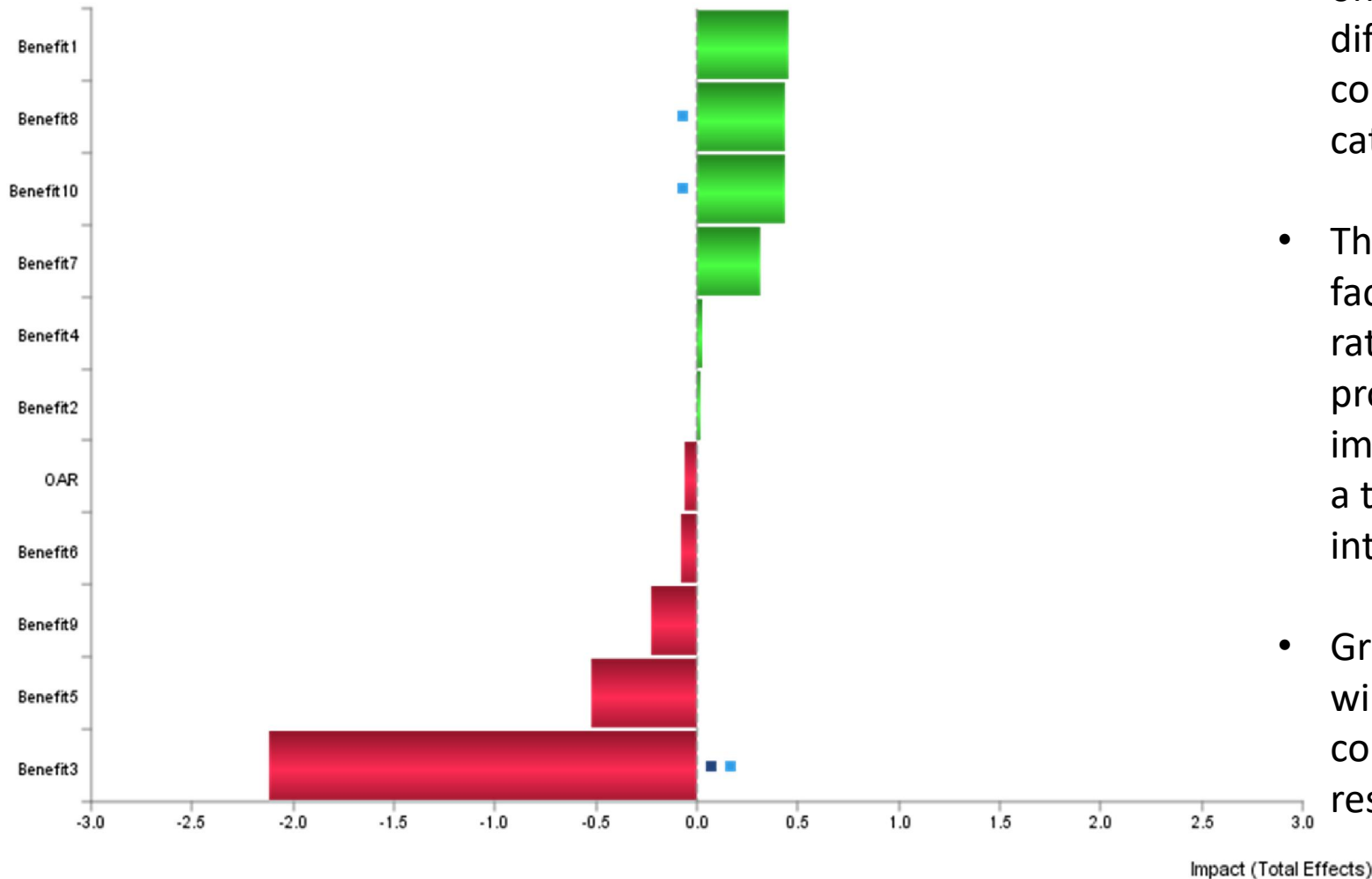


- Drivers of 6 products and brand positions on each of these drivers
- Height of horizontal bar indicates the importance of a driver
- Dots on a horizontal bar indicate product positions and their current market mean on a driver

How does Product5 perform as compared to overall category?

How do its benefits/Attributes impact Purchase Intent?

Product5 vs Overall: Impact on Purchase Intent



■ : significant according to Frequentist's t test
■ : significant according to Bayesian t test

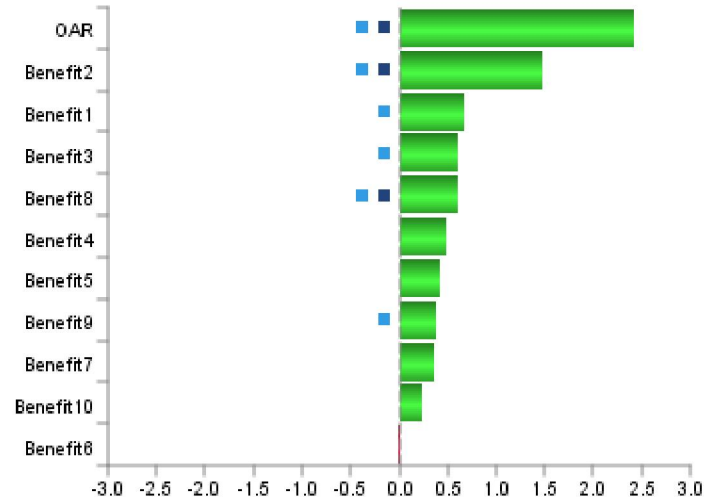
Kruschke (2013) "Bayesian estimation supersedes the t test"

- Impact of different product benefits and key measures on Purchase Intent for 6 different products as compared with its overall category
- The Impact depends on two factors (1) how consumers rate a benefit for a single product, and (2) how important this benefit is to a target (e.g., purchase intent) in its category
- Green and red means winning and losing as compared to a benchmark, respectively

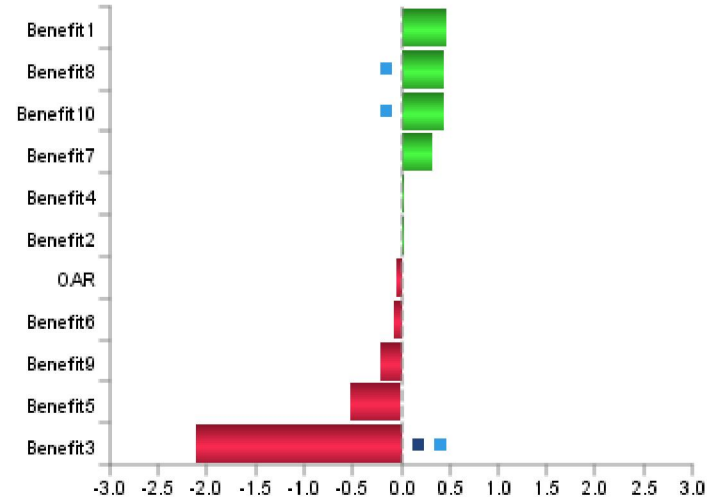
What benefits differentiate a product from its overall category?

How do these benefits impact Purchase Intent?

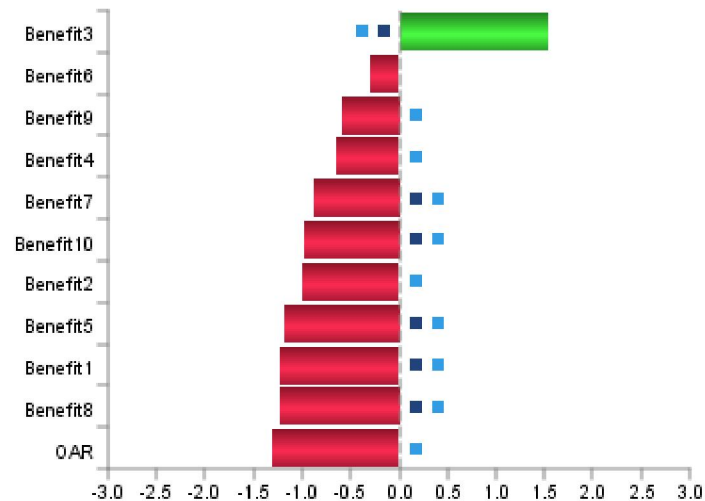
Product2 vs Overall: Impact on PurchaseIntent



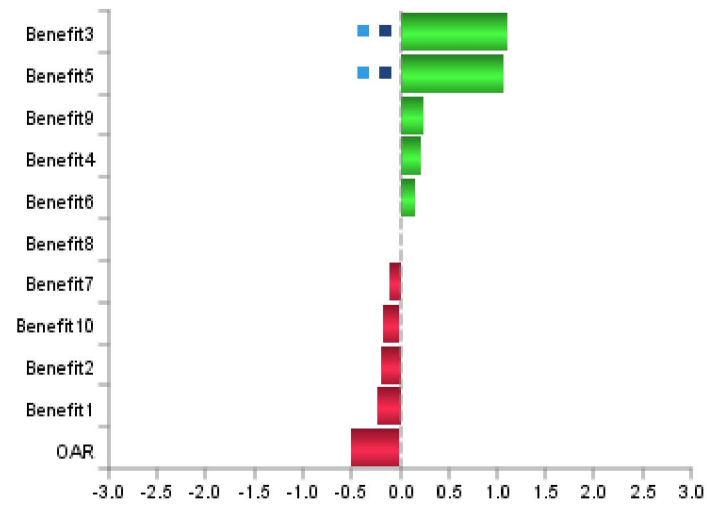
Product5 vs Overall: Impact on PurchaseIntent



Product1 vs Overall: Impact on PurchaseIntent



Product3 vs Overall: Impact on PurchaseIntent



- Product2 is the best offer winning virtually on every benefit
- Product1 is the worst offer losing virtually on every benefit
- Product5 wins on benefit1 but losing on benefit3
- Product3 wins on benefit3 but losing on benefit1

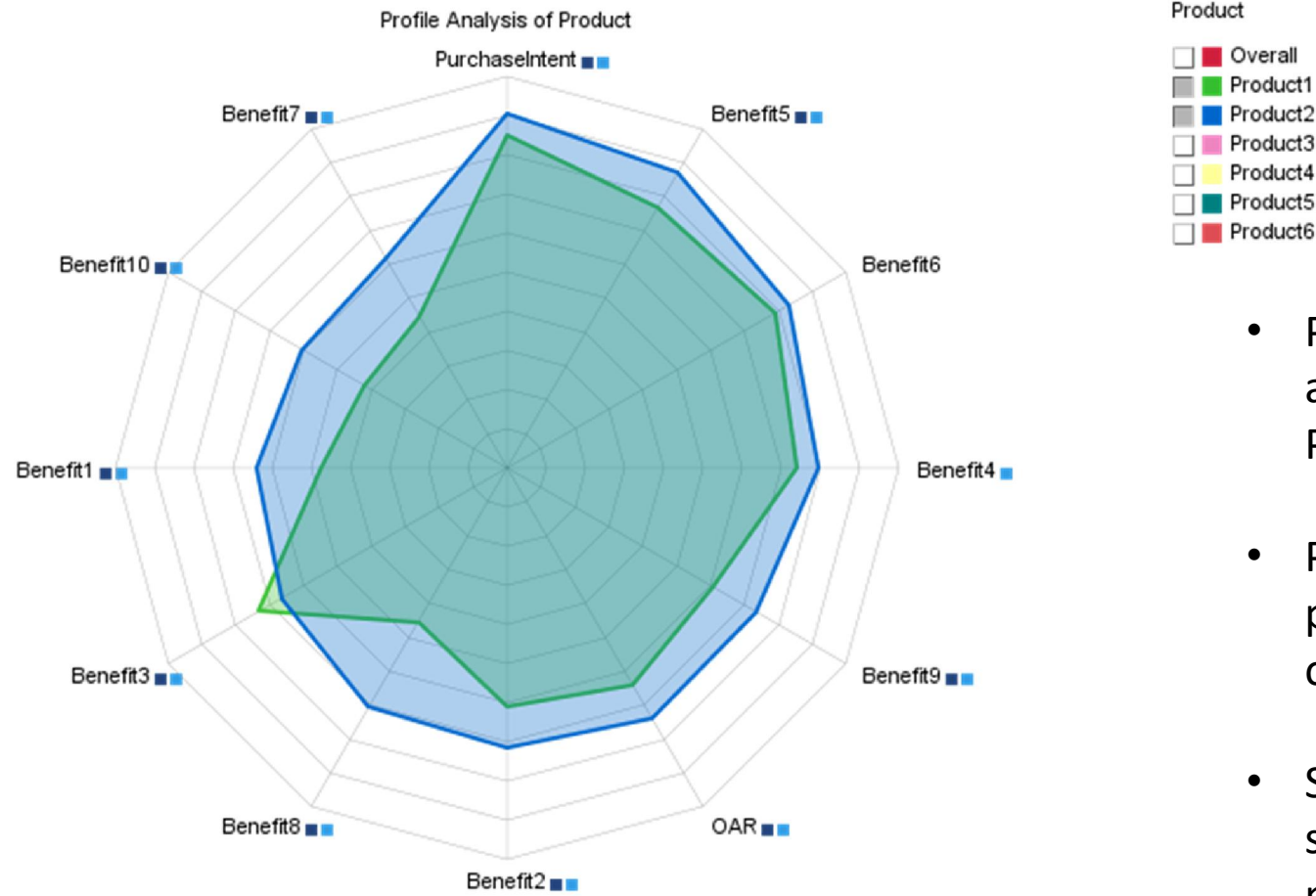
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Profiles of 6 products



- Profiles of product benefits and key measures for 6 products
- The further away from center the better a product benefit or a key measure is

How does Product1 compare with Product2?



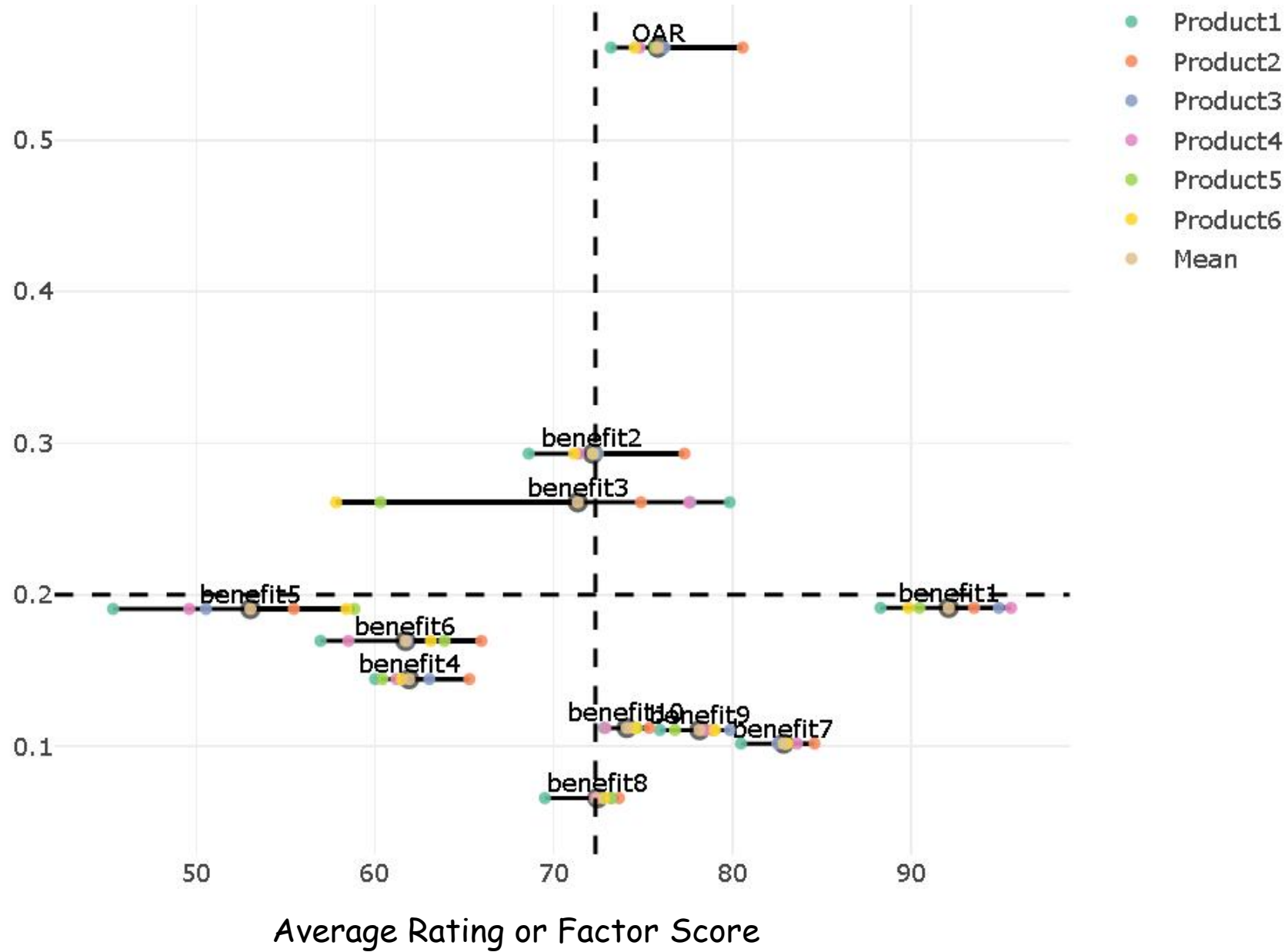
- Profiles of product benefits and key measures for Product1 and Product2
- Product2 is better than product1 on all benefits other than Benefit3
- Some of the difference are significant and practically meaningful

Summary

- Single product model or small base size model are most likely biased or even misleading. It may be used to do a exploratory analysis, but not appropriate to base your final decision on.
- Single product model even with a large base size may not provide meaningful signal. You are chasing noise in consumer's response.
- Landscape Plot, Impact Plot and Profile Plot help to sharpen your understanding of a single product leg or consumer segment

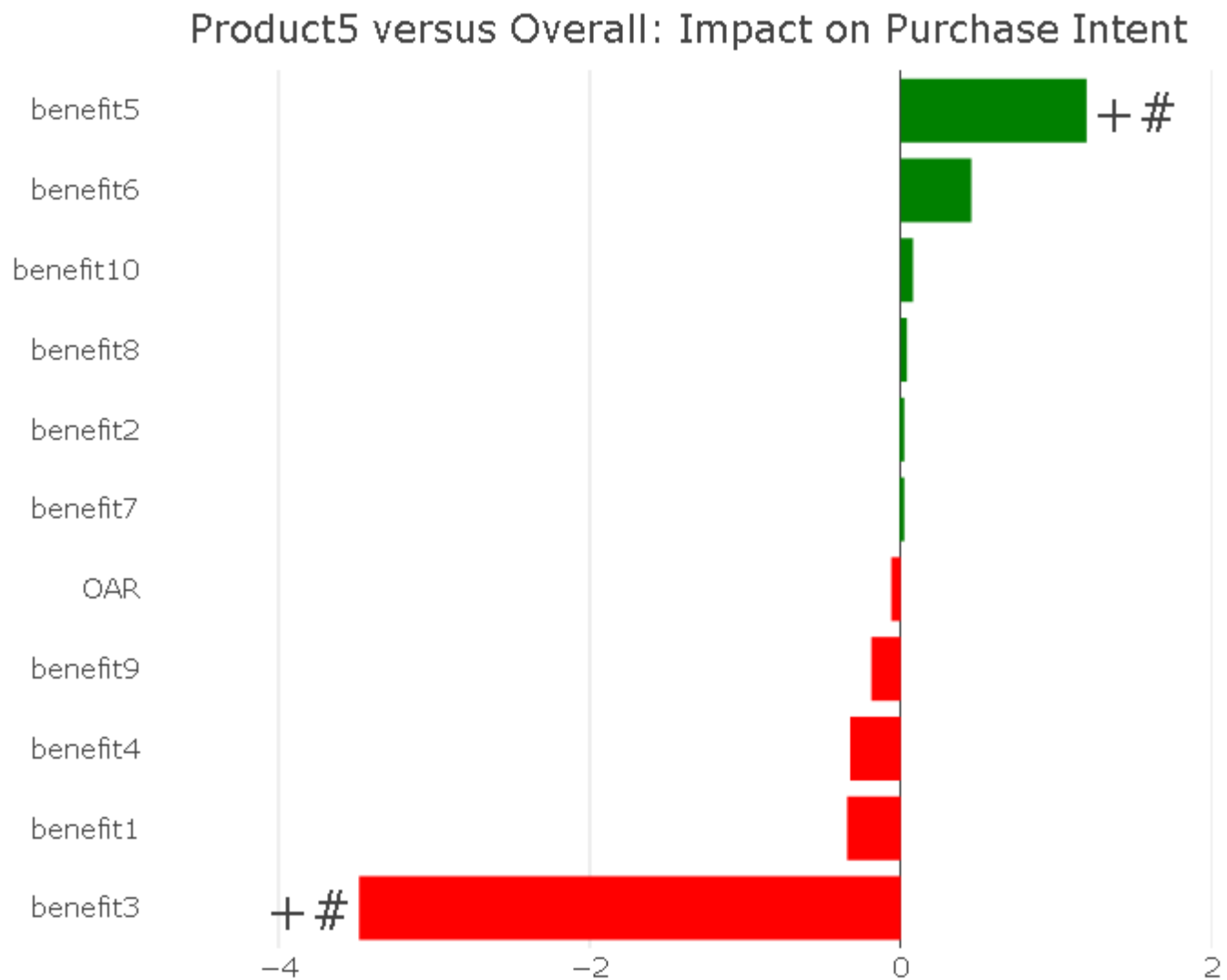
Backup Slides

Drivers: Standardized Total Effect



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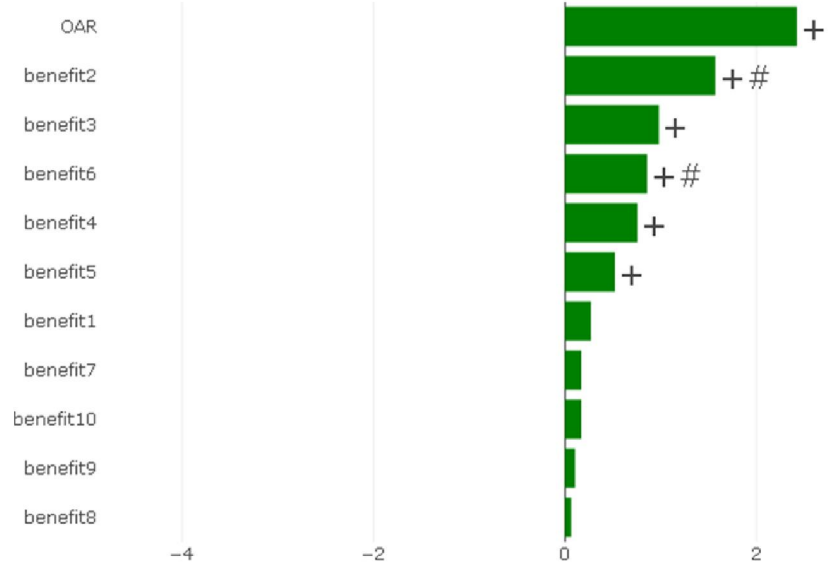
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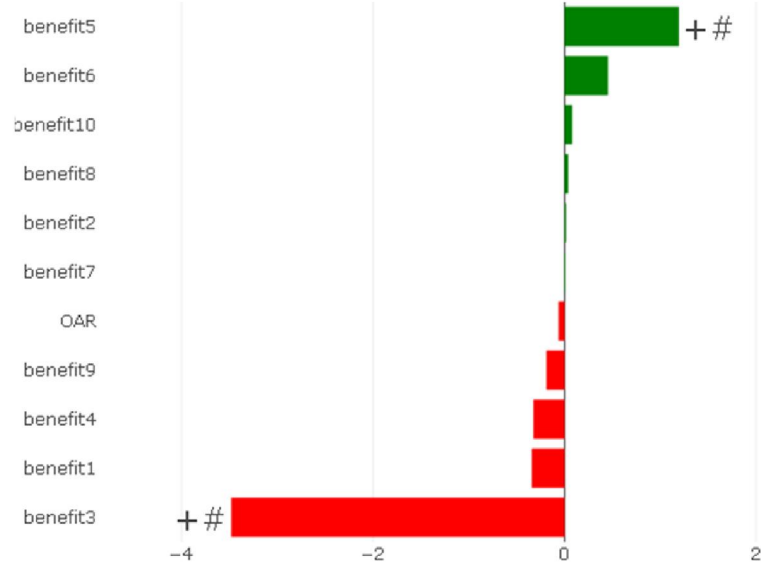
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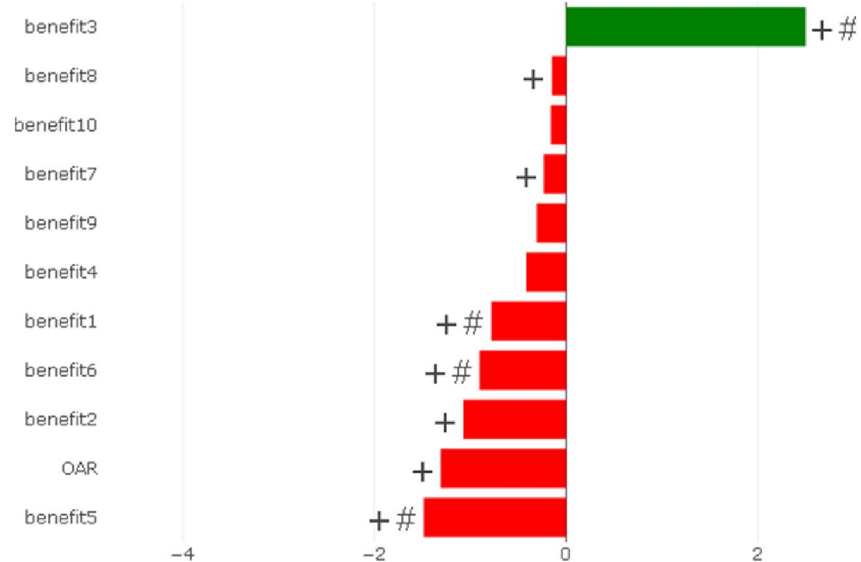
Product2 versus Overall: Impact on Purchase Intent



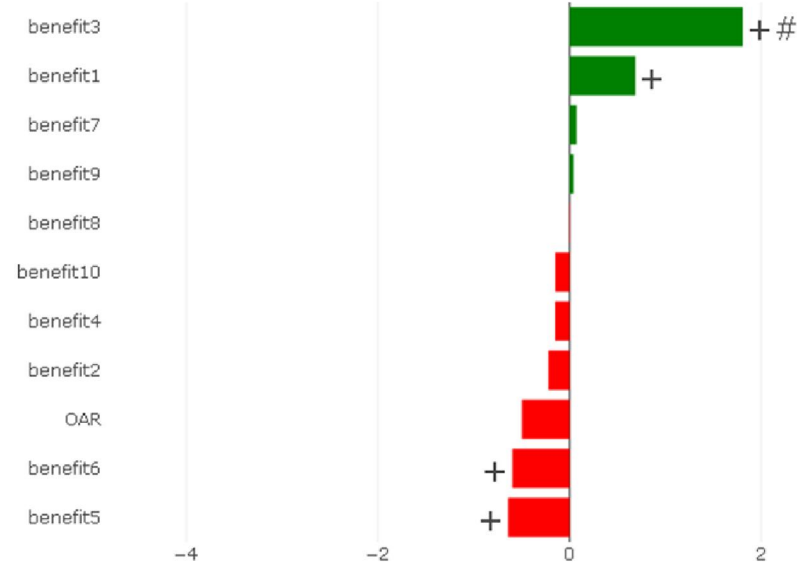
Product5 versus Overall: Impact on Purchase Intent



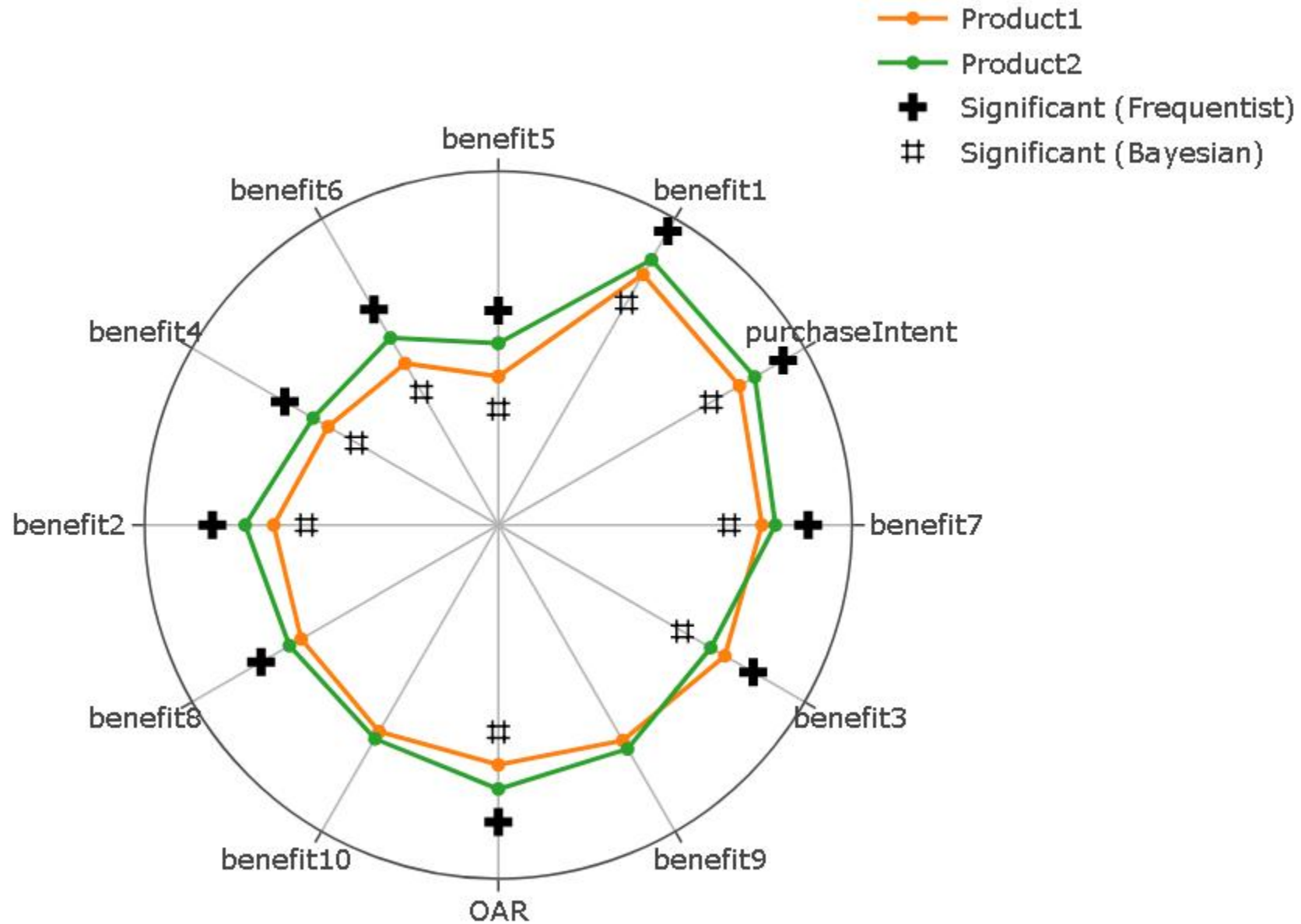
Product1 versus Overall: Impact on Purchase Intent



Product4 versus Overall: Impact on Purchase Intent



How does Product1 compare with Product2?



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