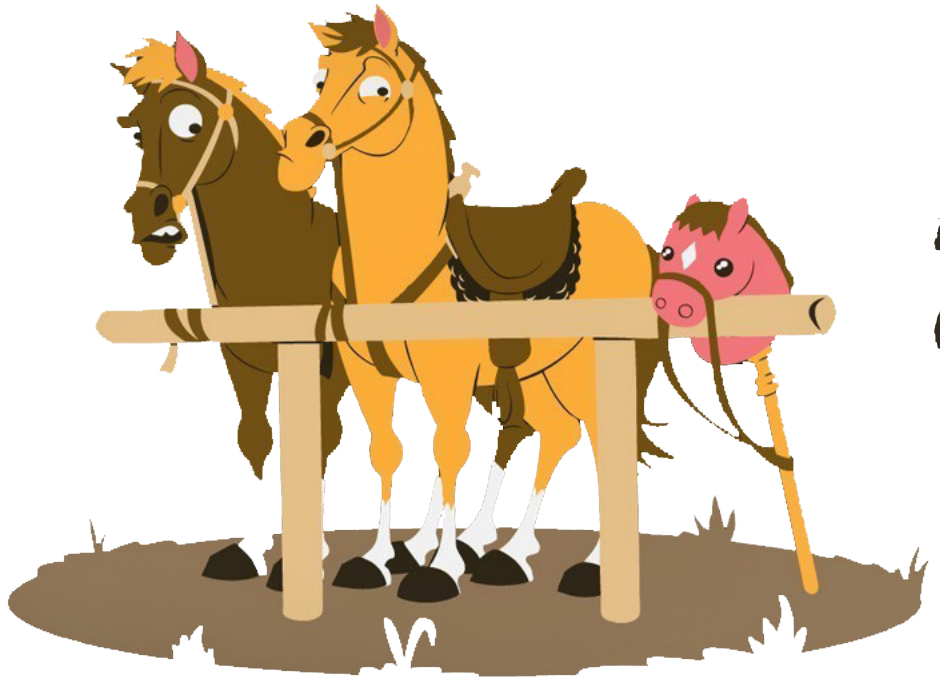


Analysis of a Toy Horse Conjoint Experiment

Team 5: Siqi Zhi | Dawei Jia | Yufei Jiang | Cenli Han | Jinchuan Ynag

March 6, 2018

Executive Summary

Two segmentation methods to better identify market needs

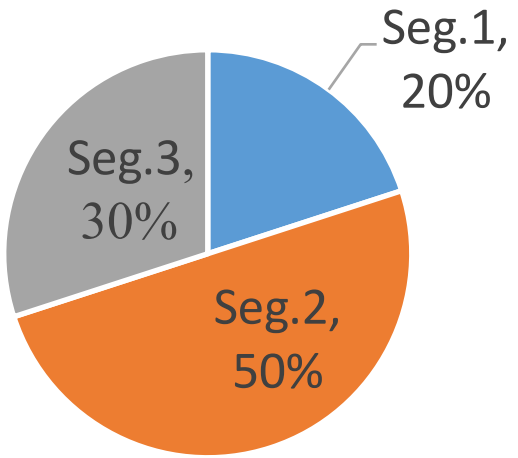
1. **Priori segmentation by gender**
   - Female kids: Less price-sensitive, love 26”, rocking and glamorous horse
   - Male kids: More price-sensitive, prefer 26” height and love bouncing and racing horse
2. **Benefit segmentation via cluster analysis**
   - Small Horse Lover: less price-sensitive, love 18” rocking and glamorous horse
   - Bouncing and Racing Lover: very price-sensitive, love 26” bouncing and racing horse
   - Tall and glamour Lover: less price sensitive, love 26” rocking and glamorous horse

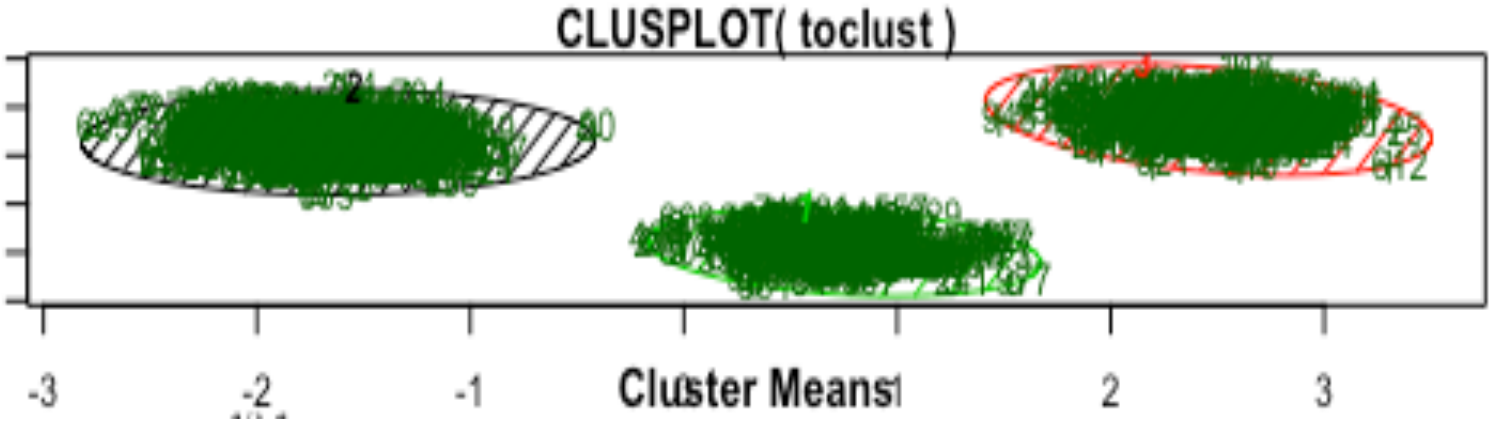
**There is no significant age difference in attribute-preferences..*

Recommendations

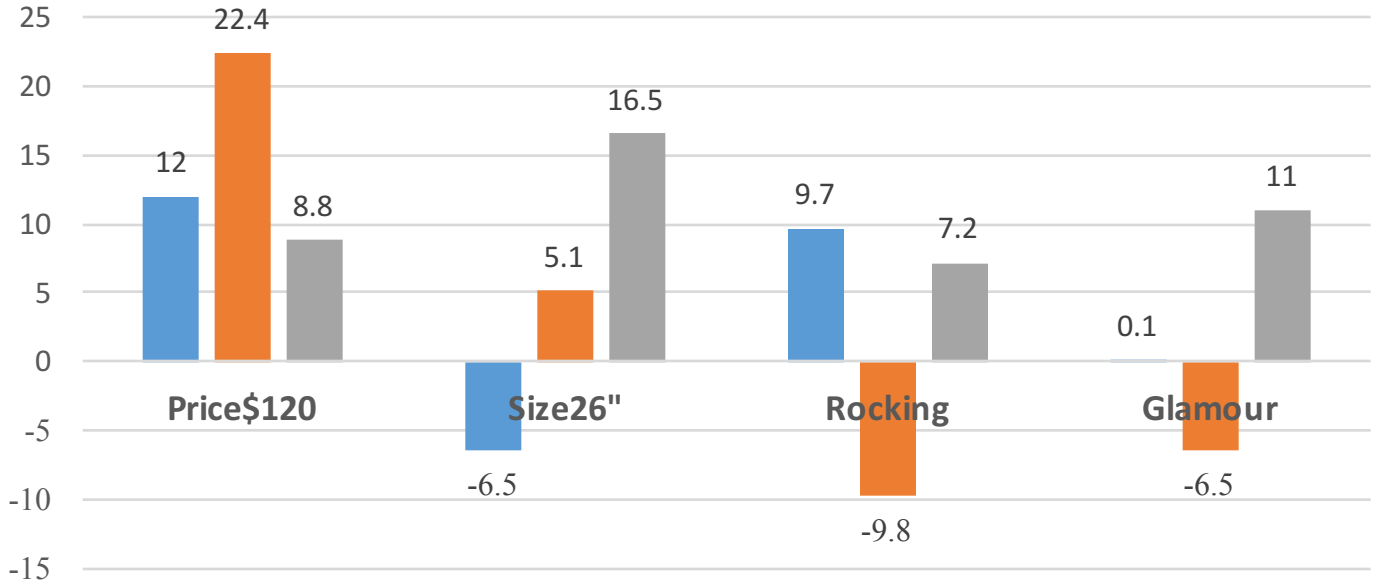
1. **Drop current product 5 and launch product 3 and product 15 to maximize profit**
   Below is suggested product combination:
   - Product 13: 18” rocking and glamorous horse ($140)- for Small Horse Lover;
   - Product 3: 26” bouncing and racing horse($140) - for Bouncing and Racing Lover;
   - Product 15: 26” rocking and glamorous horse($140) - for Tall and glamour Lover
2. **Monitor competitor price and react to changes in time**
   - Lower all of the three products’ price to $120 immediately once competitor drop price.
   - Each product’s targeted consumer group remains the same.

Benefit segmentation via cluster analysis - description of three segments





Part-utility in three segments



Description of three segments

- **Seg.1-Small horse lover (20%):** consumers who are less price-sensitive, and love 18” rocking horse and do not have much preference for style.
- **Seg.2-Bouncing and racing lover (50%):** consumers who are very price-sensitive, and love 26” bouncing and racing horse.
- **Seg.3-Tall and glamour lover (30%):** consumers who are less price sensitive, and love 26” rocking and glamorous horse.

Benefit segmentation via cluster analysis - product selection for each segment

Criteria for product selection:

1. **Higher utility:** selecting a product which could meet this consumer segments' most wants(make sure each segments' benefit utility of the targeted product is higher than other existing products).
2. **Maximized profit:** Meanwhile, the selecting product should extract as more consumer surplus as it could(e.g., a higher price is better for the company although all consumers get higher utility from low-price).

The process of product selection:

- **Step1:** We use part-utility(coefficient of attribute) to determine which product could satisfy this consumer segments' most needs than any other existing products(including competitor's and our own).
- **Step2:** After choosing a product by part-utility, we adjust the price to figure out if a higher price could still attract this targeted consumer segment.

**Calculation of utilities when choosing targeted products is listed in the appendix*

Targeted products for each segment

	Price	Size	Rocking or Bouncing	Glamour or Racing	Targeted Product
Small Horse Lover	$140	18"	Rocking	Glamour	13 (Current)
Bouncing and Racing Lover	$140	26"	Bouncing	Racing	3 (New)
Tall and Glamour Lover	$140	26"	Rocking	Glamour	15 (New)

- Although all of the three segments prefer $120 horse, consumers will still buy $140 horse when existing horses are all $140.
- Except for price, we recommend the company provide one product for each segment, which could best satisfy other three attributes(size, motion, and style).

Priori segment level conjoint analysis (by gender) - description of two segments

After running interaction of age and gender, (to test whether gender has significantly difference in attributes preference), we found that **interaction between price and age is not significant** (p-value>0.05), so we decided to **focus on the interaction of gender**.

	Intercept	Low Price	Tall Size	Rocking	Glamour
Male	32.8681	18.2158	3.6863	-2.9975	-2.7028
Female	39.9283	11.6771	12.5449	4.2040	6.6359

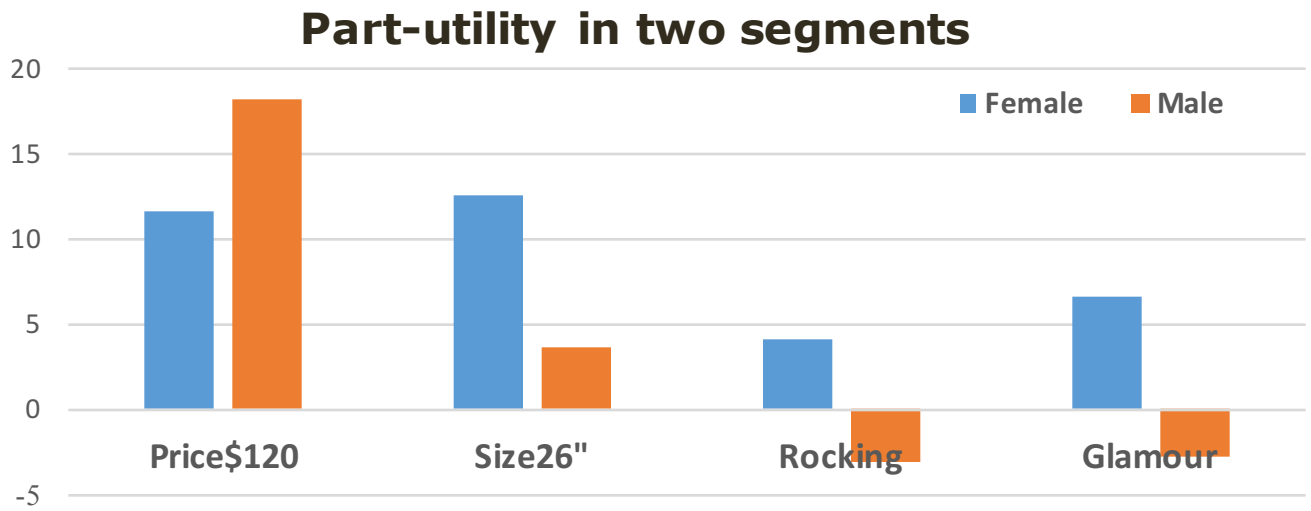
Table above shows coefficients of attributes for both male and female group, from which we could find out the utilities (coefficient) for each gender segment.

Segment descriptions of attributes difference as below:

- **Price:** Male are more price-sensitive than female.
- **Size:** Both male and female prefer tall size, but female prefer much more than male.
- **Motion:** Male prefer bouncing motion, while female prefer rocking motion.
- **Style:** Male prefer racing style, while female prefer glamour style.

Priori segment level conjoint analysis (by gender) - product selection for each segment

- The methodology of selecting products for different segments here is the same as that previously shown in benefit segmentation, which is **higher utility** and **maximized profit**.
- In short, when providing higher utility for consumers (meeting most of their wants), we should maximize profit(setting a higher price and reducing variable cost if possible).



Targeted products for each segment

	Price	Size	Rocking or Bouncing	Glamour or Racing	Targeted Product
Female	$140	26”	Rocking	Glamour	15 (New)
Male	$120	18"	Bouncing	Racing	2 (New)

- Although female prefers low price, the total utilities of 26”, rocking and glamour attributes are higher than that of low-price. So female kids would still buy product15.
- Although male prefers 26” horse, the existing products are all $140, and the utility of low price is much higher than high-height. So male kids would still choose 18” horse. In this case, the product’s variable cost is lower than the 26” version, and the company could get more profit.

**Calculation of utilities when choosing targeted products is listed in the appendix*

Product Choices Based on Priori Segments and Cluster Analysis

	Size	Motion	Style	RP	WP	VC	Target Consumer
P7(Competitor)	26''	Rocking	Racing	$140	$112	$41	-
P8(Competitor)	26''	Rocking	Racing	$120	$96	$41	-
P2	18''	Bouncing	Racing	$120	$96	$21	Bouncing and Racing Lover or Male
P3	26''	Bouncing	Racing	$140	$112	$29	Bouncing and Racing Lover
P4	26''	Bouncing	Racing	$120	$96	$29	Bouncing and Racing Lover or Male
P5(Current)	18''	Rocking	Racing	$140	$112	$33	-
P13(Current)	18''	Rocking	Glamorous	$140	$112	$33	Small Horse Lover
P14	18''	Rocking	Glamorous	$120	$96	$33	Small Horse Lover
P15	26''	Rocking	Glamorous	$140	$112	$41	Tall and Glamorous Lover or Female
P16	26''	Rocking	Glamorous	$120	$96	$41	Tall and Glamorous Lover or Female

RP: Retail Price; WP: Wholesale Price; VC: Variable Cost

Offering P3,P13,P15 is the Best Choice to Maximize Profit

	P7	P8	P2	P3	P4	P5	P13	P14	P15	P16	Profit
Scen0	63.6%					21.0%	15.4%				75,024
Scen1	0.4%				51.7%					47.9%	203,936
Scen1c		11.0%			49.6%					39.4%	179,608
Scen2	2.7%		66.9%						30.4%		247,036
Scen2c		18.6%	42.3%							39.1%	172,920
Scen3	8.1%			45.9%			14.1%		31.9%		**227,540**
Scen3c		2.2%			49.5%			17.6%		30.7%	184,552
Scen4	2.3%		62.3%				6.2%		29.2%		229,420
Scen4c		11.7%	39.3%					17.4%		31.6%	171,268

- Conducting P3,P13,P15 (scen3) is the best choice. In this case, competitor would not lower his price (in scen3c, competitor would lost market share if EarlyRiders lower its price as well). EarlyRiders' profit can be $227,540.
- Although scen2 and scen4 are more profitable, if competitor lower his price (scen2c & scen4c), he would steal market share and EarlyRiders would lost amount of profit.

**Calculation of profit is listed in the appendix*

Recommendations for next-step plan

1. **Drop current product 5 and launch product 3 and product 15 to maximize profit**
   Below is suggested product combination:
   - Product 13: 18”, rocking and glamorous horse ($140)- for Small Horse Lover;
   - Product 3: 26” bouncing and racing horse($140) - for Bouncing and Racing Lover;
   - Product 15: 26” rocking and glamorous horse($140) - for Tall and glamour Lover

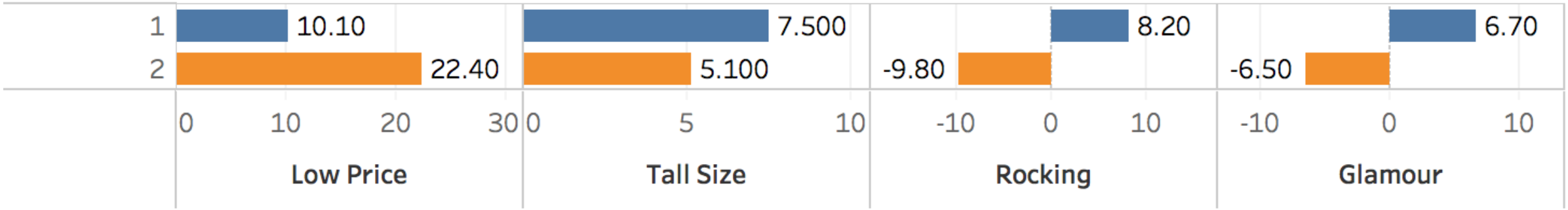
2. **Monitor competitor price and react to changes in time**
   - Lower all of the three products’ price to $120 immediately once competitor drop price.
   - New product combination: product 14, product3 and product 15.
   - Each product’s targeted consumer group remains the same.

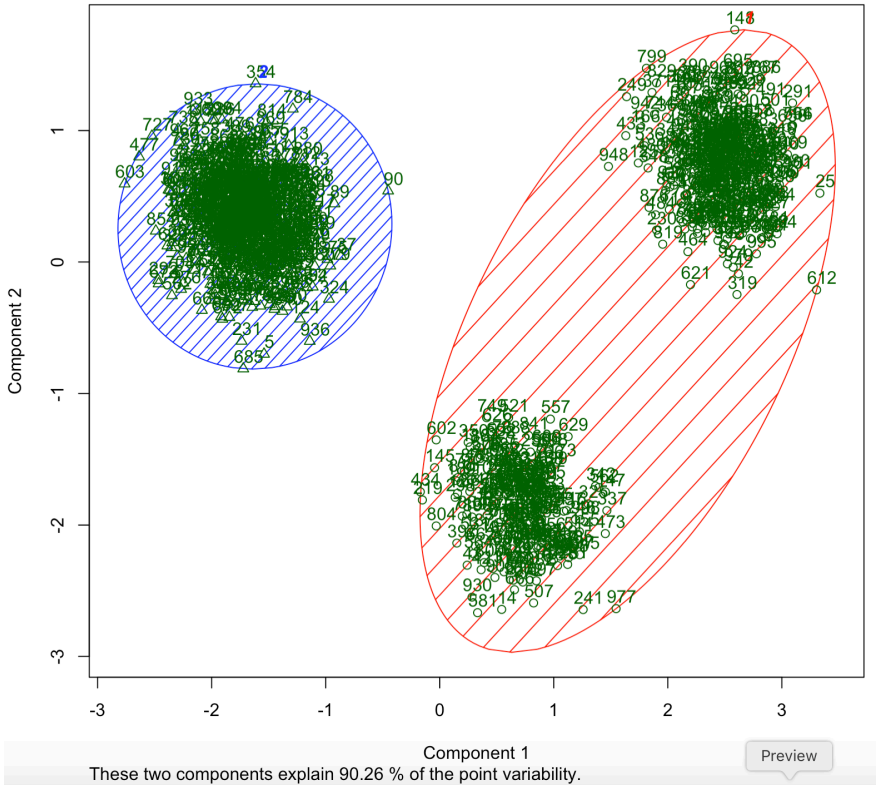
3. **Considering gender difference in preferences when promoting suggested products**
   - Product 3 is more attractive to male kids, who love bouncing and racing horse.
   - Product 15 is more attractive to female kids, who love 26” rocking and glamour horse.
   - Product 13 shows similar attractiveness to both female and male kids.

Appendix

Please refer to our appendix in case of any questions

Appendix: Alternative Cluster Analysis Segmentation -Two segments





Appendix: Description of Alternative Cluster Analysis Segmentation -Two segments

	Price	Size	Rocking or Bouncing	Glamour or Racing	Targeted Products
Bouncing and Racing Lover	$140	26"	Bouncing	Racing	3 (New)
Racing and Glamour Lover	$140	26”	Rocking	Glamour	15 (modified)

Description of segments:

Seg.1-Racing and glamour lover (50%): consumers who are less price-sensitive, and love 26” rocking and glamour style toy horse.
Seg.2-Bouncing and racing lover (50%): consumers who are very price-sensitive, and love 26” bouncing and racing horse.

Targeted Product combination:

According to customers’ preference, we target two specific products for them.
product 3: 26” bouncing and racing toy horse at price of $140. It is one of our new products in the market.
product 15: 26” rocking and glamour toy horse at price of $140. We modify our current product from 18” into 26”.

Appendix: Calculation of utilities in cluster analysis

Coefficient:				
	Price$120	Size26"	Rocking	Glamour
Small Horse Lover	12	-6.5	9.7	0.1
Bouncing and Racing Lover	22.4	5.1	-9.8	-6.5
Tall and Glamour Lover	8.8	16.5	7.2	11

	Price$120	Size26"	Rocking	Glamour
competitor P7	0	1	1	0
P13	0	0	1	1
P3	0	1	0	0
P15	0	1	1	1

	Price$120	Size26"	Rocking	Glamour	utility
Small Horse Lover					
competitor P7	0	-6.5	9.7	0	3.2
P13	0	0	9.7	0.1	9.8
P3	0	-6.5	0	0	-6.5
P15	0	-6.5	9.7	0.1	3.3
Bouncing and Racing Lover					
competitor P7	0	5.1	-9.8	0	-4.7
P13	0	0	-9.8	-6.5	-16.3
P3	0	5.1	0	0	5.1
P15	0	5.1	-9.8	-6.5	-11.2
Tall and Glamour Lover					
competitor P7	0	16.5	7.2	0	23.7
P13	0	0	7.2	11	18.2
P4	0	16.5	0	0	16.5
P15	0	16.5	7.2	11	34.7

*Targeted product has the highest utility for each segment

- Select product 13, product3 and product 15 for Small Horse Lover, Bouncing and Racing Lover, and Tall and Glamour Lover.

Appendix: Calculation of utilities in priori analysis

Coefficient:				
	Price$120	Size26"	Rocking	Glamour
Female	11.7	12.6	4.2	6.6
Male	18.2	3.7	-3	-2.7

competitor P7	0	1	1	0
P15	0	1	1	1
P2	1	0	0	0

	Price$120	Size26"	Rocking	Glamour	utility
Female:					
Competitor(P7)	0	12.6	4.2	0	16.8
Own(P15-female)	0	12.6	4.2	6.6	23.4
Own(P2-male)	11.7	0	0	0	11.7
Male:					utility
Competitor(P7)	0	3.7	-3	0	0.7
Own(P15-female)	0	3.7	-3	-2.7	-2
Own(P2-male)	18.2	0	0	0	18.2

*Targeted product has the highest utility for each segment

- Select product 15 for female and product 2 for male.

Appendix: Scenario Choices

	Product Line	Decision Explanation
Scen0	P7,P5.P13	Current Situation
Scen1	P7,P4,P16	Aligned with gender preference
Scen1c	P8,P4,P16	Competitor lower his price
Scen2	P7,P2,P15	P2 substitute for P4 to cut down cost
Scen2c	P8,P2,P16	Competitor lower his price & we lower price as well
Scen3	P7,P3,P13,P15	Aligned with cluster preference & higher price to increase margin
Scen3c	P8,P4,P14,P16	Aligned with cluster preference & competitor lower his price
Scen4	P7, P2, P13, P15	P2 substitute for P3 to cut down cost
Scen4c	P8, P2, P14, P16	Competitor lower his price & we lower price as well

Appendix: Profit Calculation

Profit = (WP – VC) * market share * market size – fixed cost * #product categories

- WP: refer to page 7
- VC: refer to page 7
- Market share: refer to page 8
- Market size: 4000 units
- Fixed cost: $20,000/product category
- # Product categories: refer to page 8