# Toy Horse Conjoint Analysis

**MSMA Group 11**

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# Executive Summary

✗   **To maximize profit, EarlyRiders should change its product mix as below:**

   **In the short term (1 yr), launch 26" Racing Bouncing $119.99 (profile 4) and 18" Glamorous Rocking $119.99 (profile 14);**

   **In the long term (2-5 yrs), remove profile 14, keep 26" Racing Bouncing $119.99 (profile 4), add 18" Racing Rocking $119.99 (profile 6) and 26" Glamorous Rocking $119.99 (profile 16).**

## Key Insights

✗   Post-hoc segmentation reveals the **3 major segments** in the market:

   **Bouncing Seeker** 40% of market, best target of **26" Racing Bouncing $119.99 (profile 4)**;

   **Elegant Rocker** 34% of market, best target of **26" Glamorous Rocking $119.99 (profile 16)**;

   **Litter Rocker** 26% of market, best target of **18" Racing Rocking $119.99 (profile 6)**.

✗   A priori segmentation shows that **profile 16, 4 and 8** are the ideal products for the 4 gender/age-based segments.

✗   Refining EarlyRiders' product mix could lead to an estimated short term market share of **94.5%** with a profit of **$199,756** and a long term market share of **94%** with a profit of **$671,955**.

✗   **New product line strategy could generate a total 5 yrs profit of $871,711, which is 1.8 times of 5 yrs profit of status quo.**

# Post-hoc Segmentation

According to post-hoc segmentation, the market can be divided into 3 segments:

✗ Like **small** model
✗ Prefer **rocking** motion
✗ Intermediately price-sensitive
✗ Indifferent about style

=> 18" Racing Rocking $119.99 (profile 6)

✗ Love **large-sized** toy horse
✗ Prefer rocking motion
✗ Least price sensitive among the three segments
✗ Especially into **glamorous style**

=> 26" Glamorous Rocking $119.99 (profile 16)

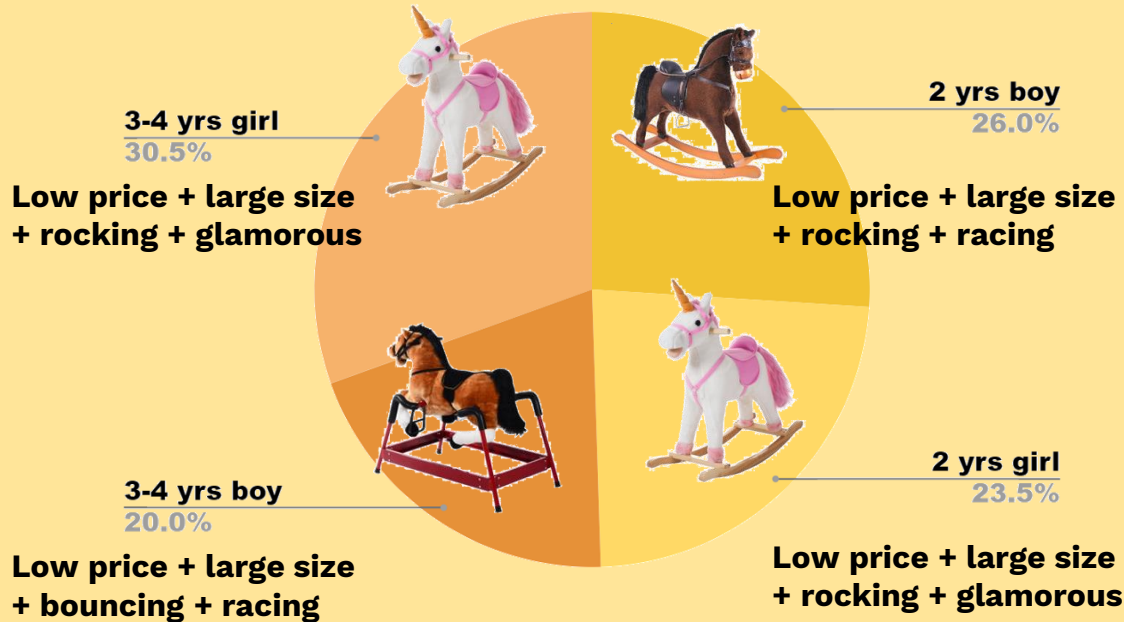Little Rocker
**26%**

Bouncing Seeker
**40%**

Elegant Rocker
**34%**
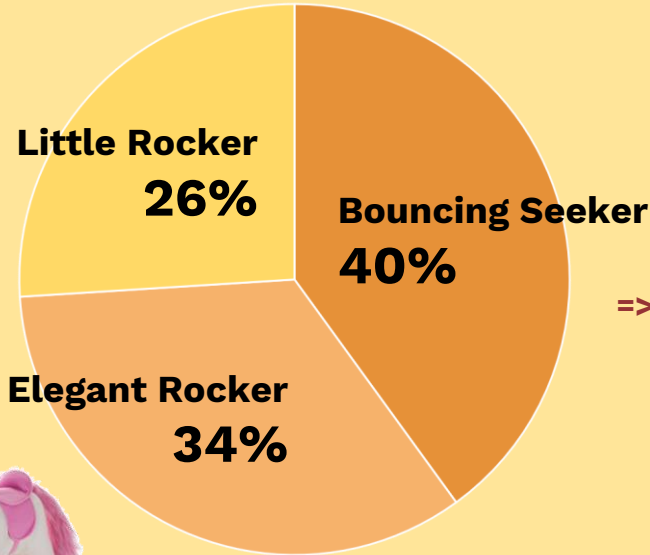
✗ Prefer large model
✗ Love **bouncing** motion
✗ **Most price-sensitive** among the three segments
✗ Prefer racing style

=> 26" Racing Bouncing $119.99 (profile 4)

\* More details about calculation are attached in Appendix 1 & 2.

# A priori Segmentation

## Segment-level attribute preferences



**3-4 yrs girl**
**30.5%**

Low price + large size
+ rocking + glamorous

**2 yrs boy**
**26.0%**

Low price + large size
+ rocking + racing

**3-4 yrs boy**
**20.0%**

Low price + large size
+ bouncing + racing

**2 yrs girl**
**23.5%**

Low price + large size
+ rocking + glamorous

✗ Based on gender and age, we divided consumers into **4 segments**.

✗ **26" Glamorous Rocking $119.99 (profile 16)** could satisfy both 2 yrs and 3-4 yrs girls, covering **more than 50%** of the market.

✗ **26" Racing Bouncing $119.99 (profile 4)** meets the need of 3-4 yrs boys, which is **yet to be satisfied** by the current products in the market.

✗ **26" Racing Rocking $119.99 (profile 8)** is the ideal product for 2 yrs boys, which could be seen in the market **if EarlyRiders' rival lowers the price** of its current product.

However, **18" Racing Rocking $119.99 (profile 6)** could also be considered for this segment.

* More details about calculation are attached in Appendix 3.

# Market Simulation (Short-term: 1 yr)

✗ We start from calculating first year's profit. In order to avoid additional cost for switching product line, we target only **two segments**.

✗ Profile 16 (26" Rocking Glamorous $119.99) performs well in stealing competitor's market share because all girls like it.

✗ However, targeting the largest two segments is not most profitable due to 26" Rocking's high variable costs.

✗ The most profitable short-term set is **profile 4 and 14**, targeting segment 1 (26%) and segment 2(40%). The highest profit is $199,756.



Little Rocker 26%
Bouncing Seeker 40%
Elegant Rocker 34%
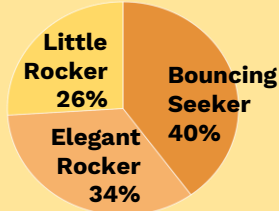
| Targeted Segmentations | Scenario | Market Share | First year's profit |
|---|---|---|---|
| **Status-quo: Seg 1 (26%)** | 7(C) \| 5, 13 | 0.57 \| 0.22, 0.21 | $135,863 |
| **Segments (26% + 40%)** | 7(C) \| 4, 14 | 0.055 \| 0.52, 0.425 | **$199,756** |
| **Segments (40% + 34%)** | 7(C) \| 4, 16 | 0 \| 0.405, 0.595 | $186,067 |
| **Segments (26% + 34%)** | 7(C) \| 6, 16 | 0 \| 0.5, 0.5 | $189,293 |

✗ Concern: When being stolen market share, what would our competitor do in response?

* More details about calculation are attached in Appendix 4.

# Market Simulation (Long-Term: 2-5 yrs)

✗ Competitor's Reaction: Lower its price, more like **Profile 8**.

✗ After calculation, we found the profit of covering all 3 segments is **larger** than only targeting 2 segments regarding to competitor's reaction, so we list 2 scenarios for 3 segments below:

| Scenario | Market Share | 2nd year's profit | 3-5 years' profit |
|---|---|---|---|
| **8(C) \| 4, 14, 16** | 0.085 \| 0.355, 0.22, 0.34 | $158,677 | $496,029(165,343*3) |
| **8(C) \| 4, 6, 16** | 0.06 \| 0.355, 0.235, 0.35 | $157,989 | **$513,966(171,322*3)** |

✗ As A priori segmentation shows, preferences of kids vary most upon motion and style, so compared with Profile 14, we would recommend to launch **Profile 6**.

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* More details about calculation are attached in Appendix 4.

* Since most of toy horses' sold around holidays, we assumed competitors will react to our price one year later.

* As to long-term profit, we need to calculate switching fixed cost in 2nd year, but don't need to consider it afterwards because product types don't change.

# Market Simulation (Best Launch Plan)

|  | **Short Term (1st Yr)** ➕ | **Long Term (2-5 Yrs)** |
|---|---|---|
| **Competitor** | Profile 7<br>26" Rocking Racing ($139.99) | Profile 8<br>26" Rocking Racing ($119.99) |
| **EarlyRiders** | Profile 4<br>26" Bouncing Racing ($119.99)<br>Profile 14<br>18" Rocking Glamorous ($119.99) | Profile 4<br>26" Bouncing Racing ($119.99)<br>Profile 6<br>18" Rocking Racing ($119.99)<br>Profile 16<br>26" Rocking Glamorous ($119.99) |

✗ **Highest Profit for 5 years = $871,711**

**1.8 times** of 5 years' profit for status quo ($479,315)

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\* More details about calculation are attached in Appendix 4.
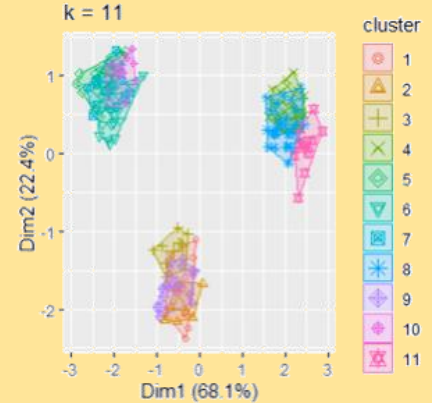
# Appendix 1: Post-hoc Segmentation
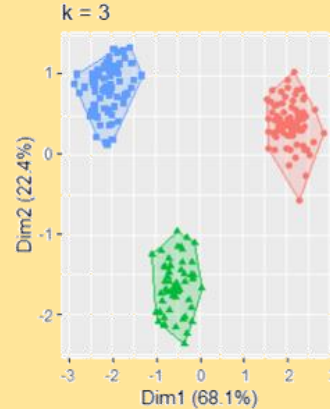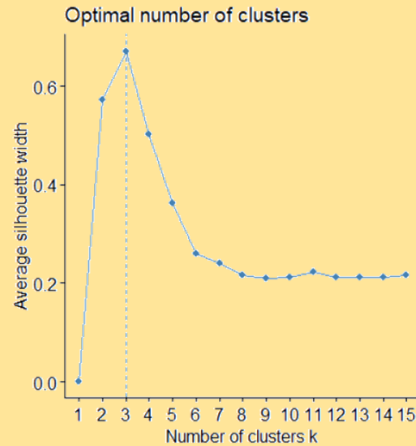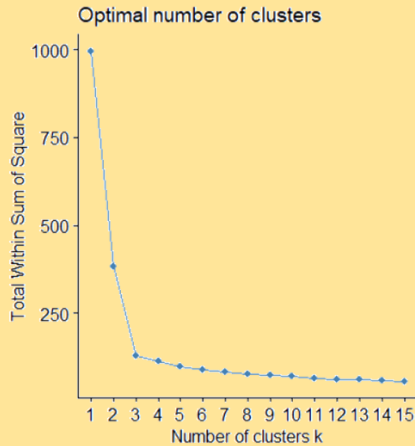
**✗ Determining number of clusters**

Strong elbow pattern shows that three is the appropriate number of segments;

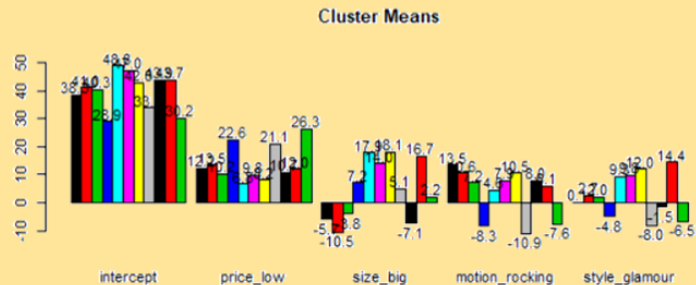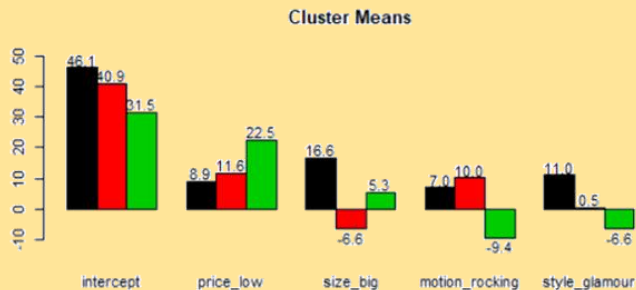Focal points are at 3 and 11. 11 might be too many for 200 observations.

k = 3 gives the best clustering results;

k = 11 leads to a lot of overlap and low sample size in each segments.

# Appendix 2: Post-hoc Segmentation

✗   **Segmentation when k = 3 & k = 11**
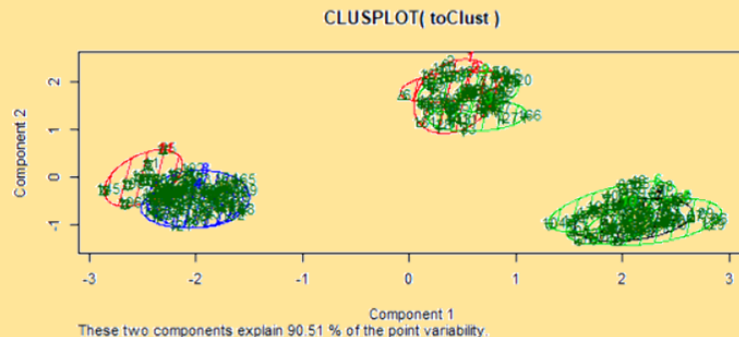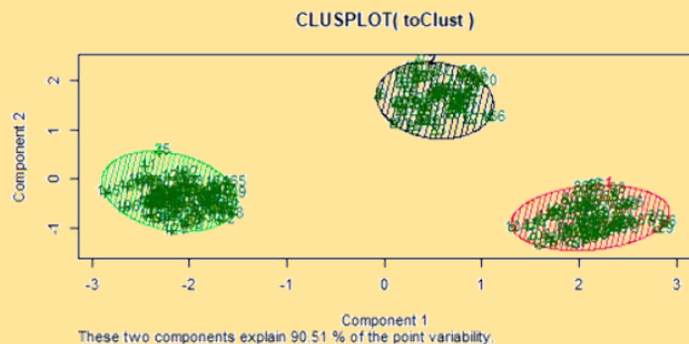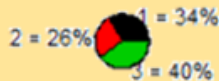
# Appendix 3: A priori Segmentation

**Segment-level coefficient**

```
         Seg          intercept           price_low            size_big       motion_rocking        style_glamour
  2 yrs Boy  37.7780267143818  15.3906177935589  2.36245814431254   1.69320608407532  -0.982335303747005
  2 yrs Girl 41.5024394055103  13.3319869939158  5.50244551137718   4.01400430521182   3.58642237286768
  3-4 yrs Boy 34.9923031656956 18.7640856527807  5.78594894284468  -3.94944192462098  -3.0688800419214
 3-4 yrs Girl 40.3828391322824 13.6446117550202  9.49144115552754   2.05365364835707   3.83530650030119
```

**Segment-level preference and ideal profile**

| Segment | Size | Preference | Ideal Profile |
|---|---|---|---|
| **2 yrs Boy** | **832(26%)** | **Low price+large size+rocking+racing** | 8, (6) |
| **2 yrs Girl** | **752(23.5%)** | **Low price+large size+rocking+glamorous** | 16 |
| **3-4 yrs Boy** | **640(20%)** | **Low price+large size+bouncing+racing** | 4 |
| **3-4 yrs Girl** | **976(30.5%)** | **Low price+large size+rocking+glamorous** | 16 |

\* Profile 6 can also be considered by 2 yrs boy, since coefficient of size_big is smallest compared with other segments.

# Appendix 4: Market Simulation

| SCENARIO | | P7 | P8 | P5 | P13 | P16 | P4 | P14 | P6 | Revenue-VC | 1st/ 2nd Profit | 2-5 yrs profit | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | | | | 111.99 | 111.99 | 95.99 | 95.99 | 95.99 | 95.99 | | | | |
| VC | | | | 33 | 33 | 41 | 29 | 33 | 33 | | | | |
| FC | | | | | | | | | | | | | |
| 7, 5, 13 | Current | 0.57 | | 0.22 | 0.21 | | | | | 135,863 | 95,863 | 95,862.80 | |
| | | | | | **SHORT TERM** | | | | | | | | |
| 7,4,13 | | 0.145 | | | 0.205 | | 0.65 | | | 238,946 | 192,279 | | |
| **7,4,14** | | **0.055** | | | | | **0.52** | **0.425** | | **246,422** | **199,756** | | |
| | | | | | | | | | | | | | |
| 7,5,4 | | 0.155 | | 0.19 | | | 0.655 | | | 235,546 | 188,880 | | |
| 7,6,4 | | 0.12 | | | | | 0.61 | | 0.27 | 231,485 | 184,818 | | |
| | | | | | | | | | | | | | |
| 7,4,16 | | 0 | | | | 0.595 | 0.405 | | | 239,400 | 186,067 | | |
| | | | | | | | | | | | | | |
| 7,5,16 | | 0.005 | | 0.035 | | 0.96 | | | | 222,220 | 175,554 | | |
| 7,6,16 | | 0 | | | | 0.5 | | | 0.5 | 235,960 | 189,293 | | |
| | | | | | | | | | | | | | |
| 7,13,16 | | 0.005 | | | 0.05 | 0.945 | | | | 223,660 | 176,994 | | |
| 7,14,16 | | 0.005 | | | | 0.695 | | 0.3 | | 228,460 | 181,794 | | |
| | | | | | **LONG TERM** | | | | | | | | |
| 8,4,14 | If we don't add new | | 0.335 | | | | 0.4 | 0.265 | | 173,953 | 133,953 | | |
| 8,4,16 | products in long term | | 0.18 | | | 0.465 | 0.335 | | | 192,048 | 138,715 | | |
| | | | | | | | | | | | | | |
| 8,16,4,14 | if competitor lowers price | | 0.085 | | | 0.34 | 0.355 | 0.22 | | 225,343 | 158,677 | 165,343.40 | |
| | | | | | | | | | | | | | |
| **8,16,4,6** | **if competitor lowers price** | | **0.06** | | | **0.35** | **0.355** | | **0.235** | **231,322** | **157,989** | **171,322.40** | |
| | | | | | | | | | | | | | |
| **4000** | **Market Share** | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| **20000** | Fixed Cost | | | | | | | | | | | | |
| **6666.6667** | Switch Fixed Cost(Extra) | | | | | | | | | | | | |