

Toy Horse Conjoint Experiment Analysis

MSMA Team 10

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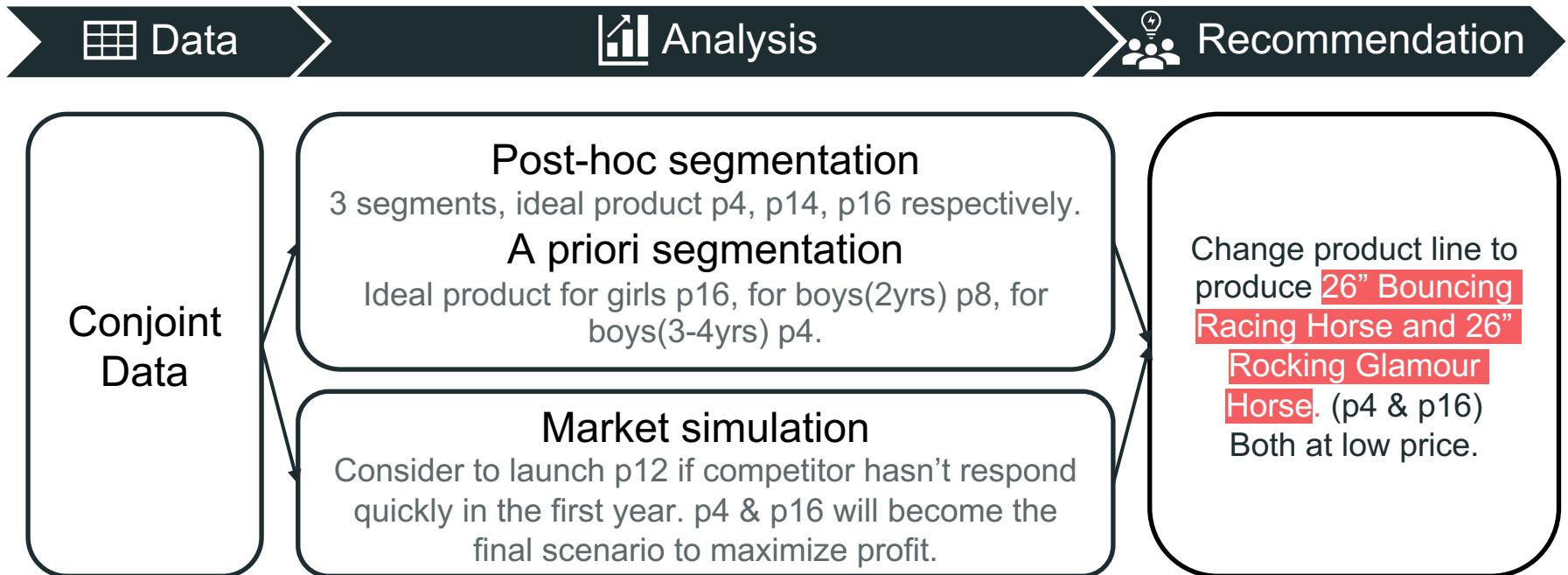


Executive Summary



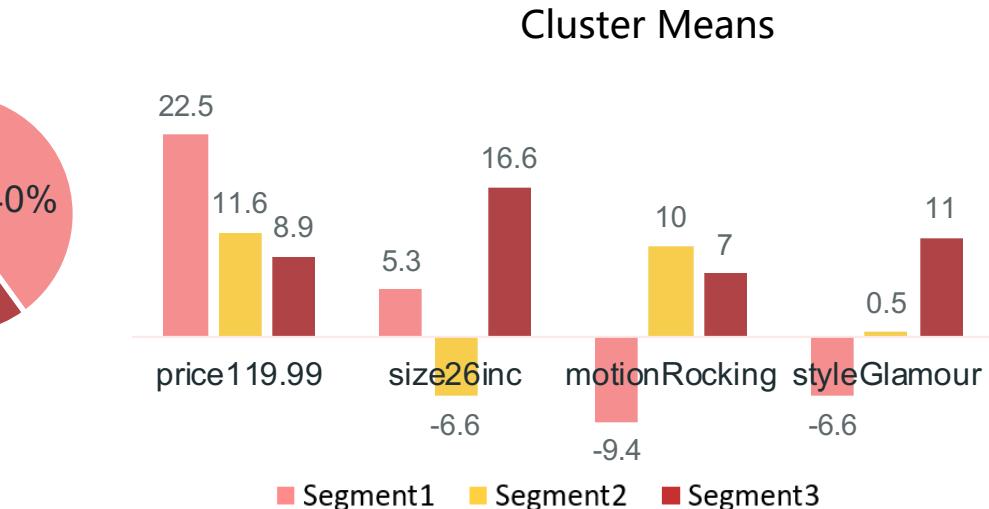
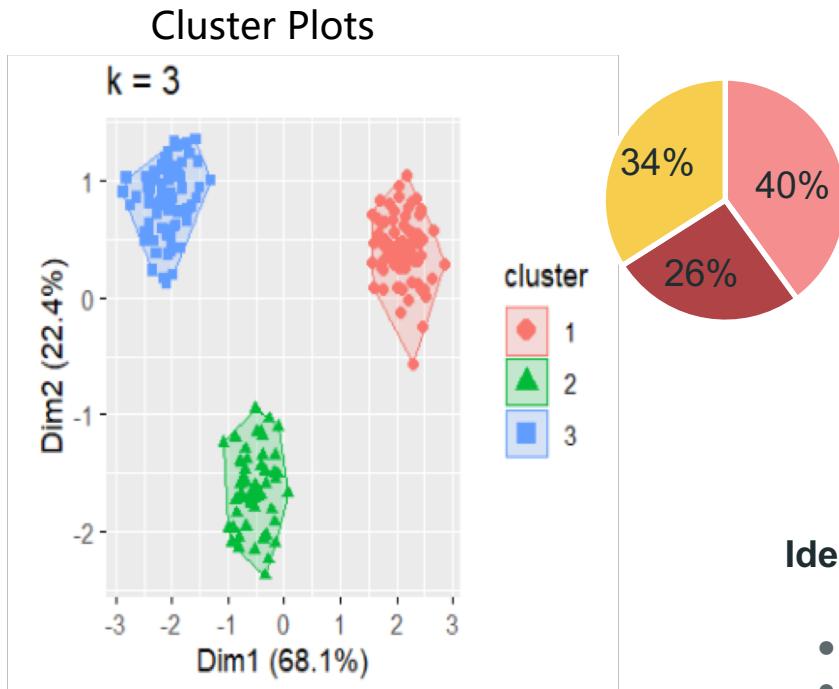
Adjust our product line

Goal based on segmentation, competitor's product and his response



Post-hoc segmentation

Cluster analysis of part-utilities: 3 clusters is the best scheme



Ideal product (highest utility) for each segment:

- Segment 1: Profile 4 (119.99, 26", bouncing, racing)
- Segment 2: Profile14 (119.99, 18", rocking, glamour)
- Segment 3: Profile16 (119.99, 26", rocking, glamour)

See appendix A for the method of how to choose the optimal number of clusters.

A priori segmentation

Girls like rocking glamour style, while 3-4 yrs boys prefer bouncing racing style

Segment	age_gender	(Intercept)	price119.99	size26inc	motionRocking	styleGlamour
1	2yrs, male	37.78	15.39	2.36	1.69	-0.98
2	3-4yrs, male	34.99	18.76	5.79	-3.95	-3.07
3	2yrs, female	41.50	13.33	5.50	4.01	3.59
4	3-4yrs, female	40.38	13.64	9.49	2.05	3.84

Ideal product (highest utility) for each segment:

- Female (2 yrs & 3-4 yrs) : **Profile 16** (119.99, 26", rocking, glamour)
- Male(2 yrs): **Profile 8** (119.99, 26", rocking, racing)
- Male(3-4 yrs): **Profile 4** (119.99, 26", bouncing, racing)

Market simulation

Current product line gains 43% market share, and could yield over \$95,000 profits

Scenario 1: Profile 5, 13 ; Profile 7(competitor)

Total market size: 4000 units

Scenario	P5	P7	P13	Fixed Cost	Profit
Price	\$111.99		\$111.99		
MC	\$33.00		\$33.00		
MS	22%	57%	21%	\$40,000.00	\$95,862.80

MC= marginal cost, MS = market share

**Grey color reflects competitor's product line and market share*

First year

Changing current product line to P12 would yeild highest profit

A : Entry \$119.99 18" Bouncing Glamour (P10)

B : Entry \$119.99 26" Bouncing Glamour(P12)

C : Entry \$119.99 18" Rocking Glamour(P14)

D : Entry \$119.99 26" Rocking Glamour(P16)

Scenario	P7	P10	P12	P14	P16	Fixed Cost	Profit
Price		\$95.99	\$95.99	\$95.99	\$95.99		
MC		\$21.00	\$29.00	\$33.00	\$41.00		
A-MS	24%	76%				\$26,666.67	\$201,302.90
B-MS	8%		92%			\$26,666.67	\$219,856.50
C-MS	10%			90%		\$20,000.00	\$206,764.00
D-MS	0.5%				99.5%	\$26,666.67	\$192,193.50

Second year

Assume that competitor changes P7 to P8, best response is to launch P4 and P16

X: P4, P12

Y: P12, P16

Z: P4, P16

Scenario	P4	P8	P12	P16	Fixed Cost	Profit
Price	\$95.99		\$95.99	\$95.99		
MC	\$29.00		\$29.00	\$41.00		
X-MS	33%	40.5%	26.5%		\$46,666.67	\$112,769.50
Y-MS		27.5%	27.5%	44%	\$46,666.67	\$123,804.70
Z-MS	35.5%	18%		46.5%	\$53,333.34	\$144,073.90

Long-run performance (in 5 years)

Long-run strategy depends on whether competitor will respond to the market change immediately

I : Entry 5, 13 (current) -> 12 (1st year) -> 4, 16 (2nd to 5th year)

II: Entry 5, 13 (current) -> 4, 16 (1st to 5th year)

Scenario	Year 1 Profit	Year 2 Profit	Year 3 Profit	Year 4 Profit	Year 5 Profit	Total Profit
I	\$219,856.50	\$144,073.90	\$157,407.20	\$157,407.20	\$157,407.20	\$836,152.00
II	\$144,073.90	\$157,407.20	\$157,407.20	\$157,407.20	\$157,407.20	\$773,702.70

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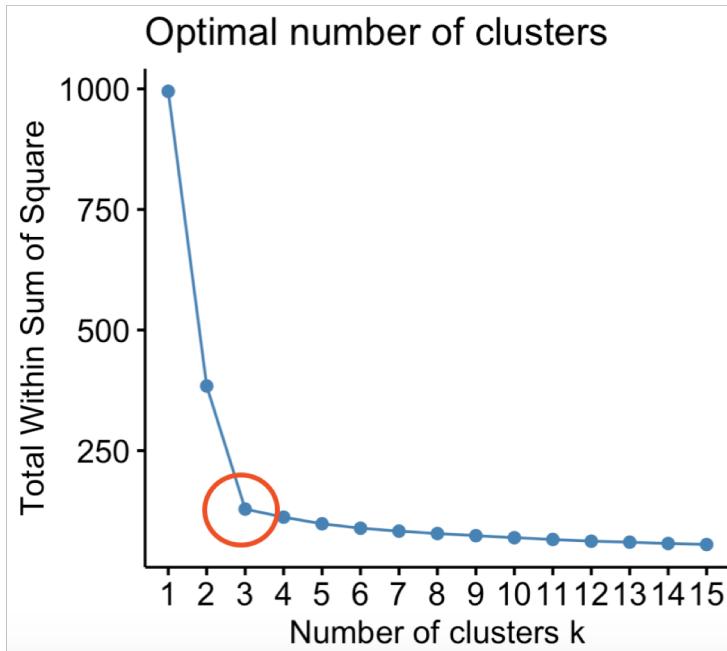
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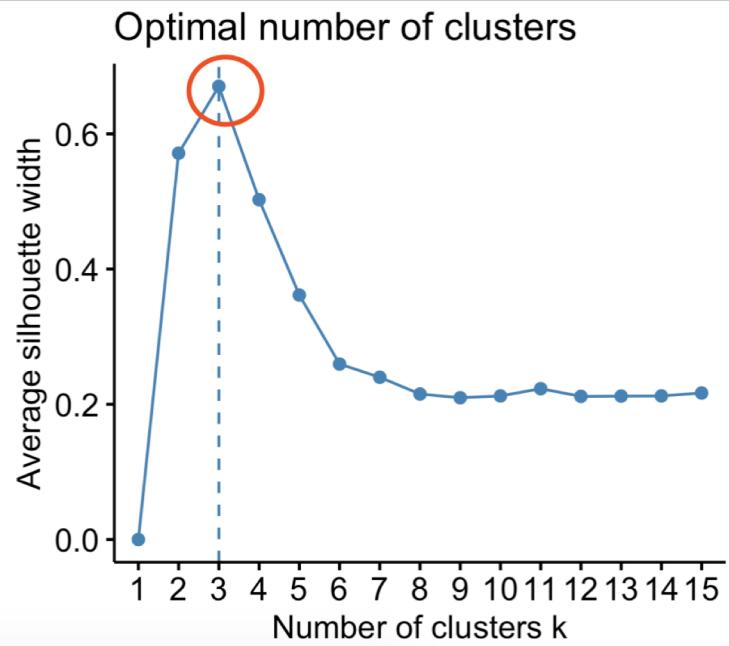


Appendix A: Optimal number of segments

Elbow rule: 3

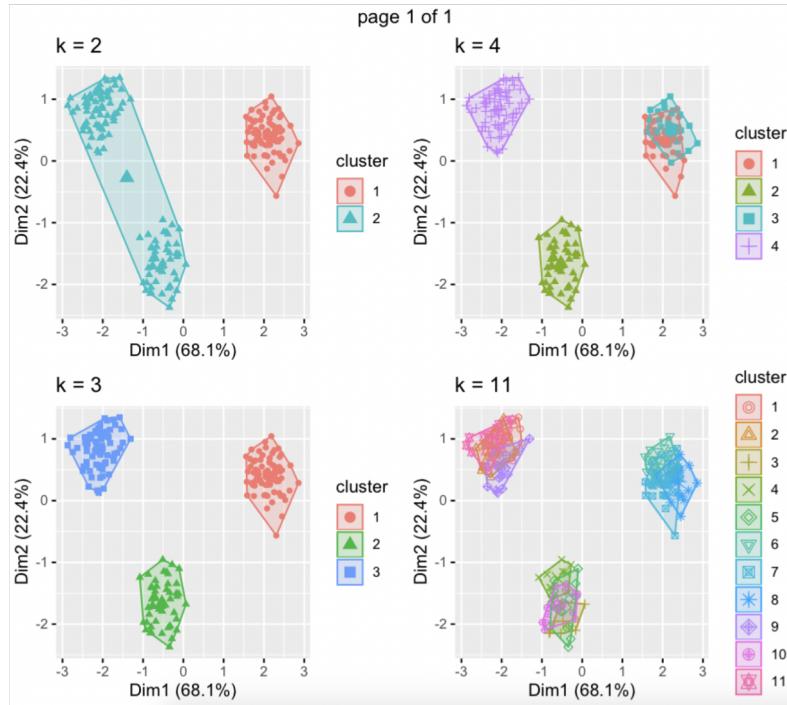


Focal point at 3



Appendix A: Optimal number of segments - Cont.

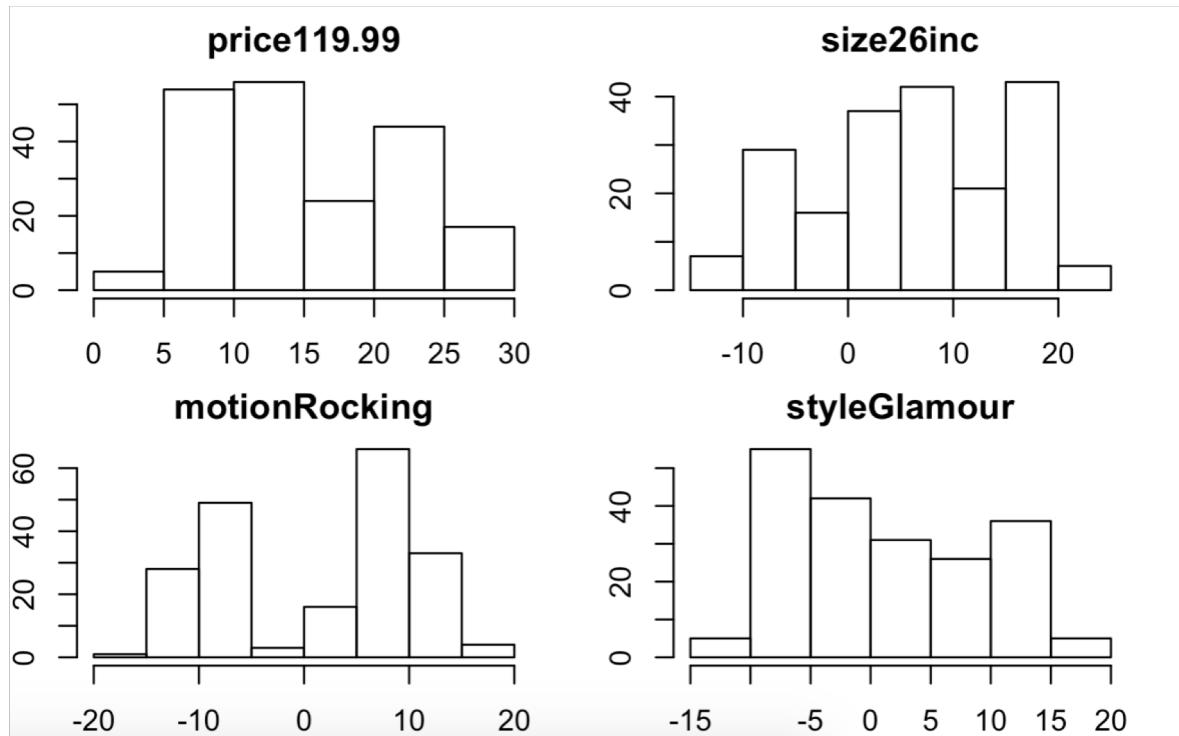
Cluster plots against principle components



- k=3: looks reasonable
- k=2: has 2 clearly separate clusters in one segment
- k=4 and k=11: a lot of overlap

K=3 is the best scenario.

Appendix B: Distribution of individual part-utilities



- **Price:** Customers are price sensitive.
- **Motion:** Customers have clear preference for rocking or bouncing.