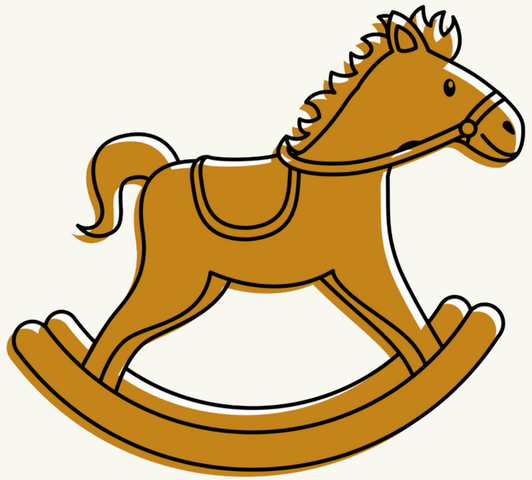


Toy Horse Conjoint Analysis

Team 13 Tong Niu | Zhaohui Li | Yunqing Yu | Qiqi Liu | Xiao Yang

February, 2020

Executive Summary

Recommendation

- **Product:**
  - Launch products targeting at 3 different segments respectively, which correspond to
    - Profile 3 $139.99 | 26 inches | Bouncing | Racing
    - Profile 13 $139.99 | 18 inches | Rocking | Glamour
    - Profile 15 $139.99 | 26 inches | Rocking | Glamour

- **Pricing:**
  - Monitor actions of our competitor, prepare different pricing strategy to the same set of products.
  - Use signaling i.e. price match to sustain higher profit margin.

- **Promotion:**
  - Highlight “Bouncing, Racing” when promote horse toys to boys while promoting “Rocking, Glamour” to girls.
  - Promote 18 inches toy horse with focus on the only small size in local market.

Analytics Framework

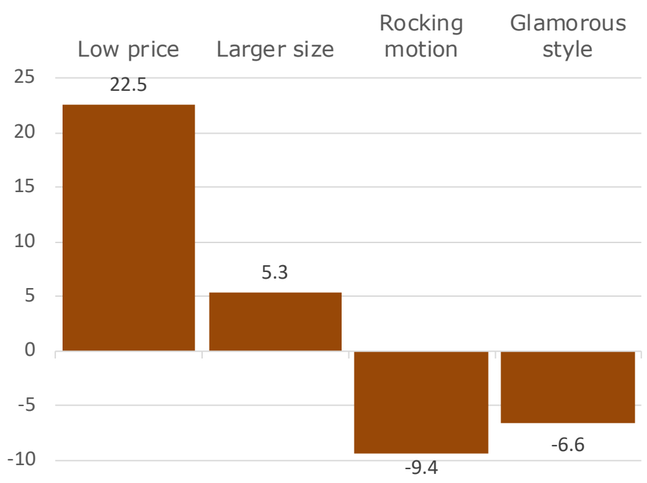
Three Segments

— Cluster Analysis

Price Radar
40%

Profile 3/4

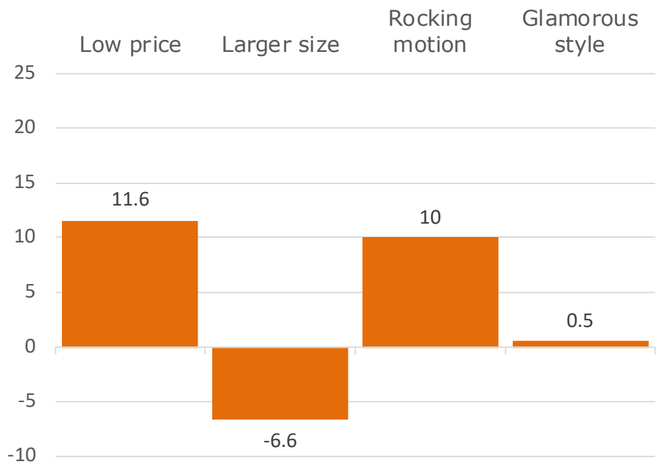
Very price sensitive; Prefer **26”, Racing, Bouncing** Toy Horse



Rocking Star
26%

Profile 13/14

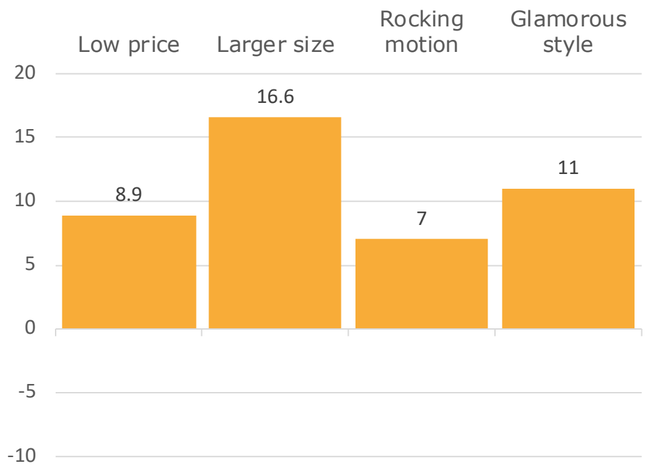
Price sensitive; Prefer **18”, Glamorous, Rocking** Toy Horse



Glamour Lover
34%

Profile 15/16

Least price sensitive; Prefer **26”, Glamorous, Rocking** Toy Horse



***See cluster analysis results in Appendix 1 and Appendix 2.**

Gender Segmentation

— A Priori Analysis

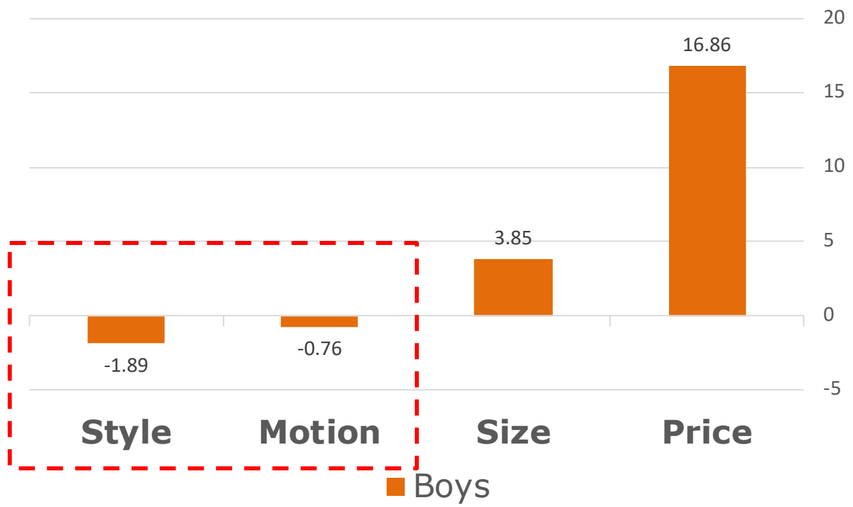
Boys
Profile 3/4

both are price sensitive

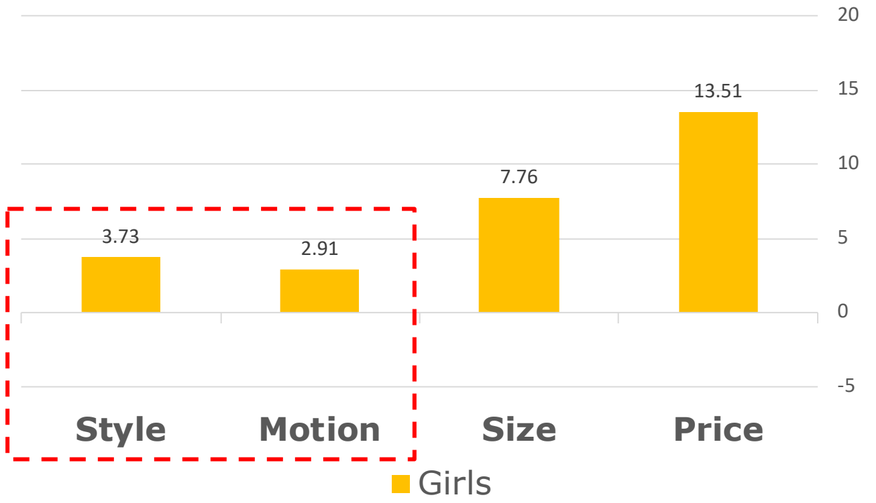
prefer lager size

Girls
Profile 15/16

Similar preference with 'Price Radar'
- **Bouncing**
- **Racing**



Similar preference with 'Rocking Star'
- **Rocking**
- **Glamorous**



*There is no significant preference differences between younger kids and older kids, thus we didn't consider segmenting based on age. (See Appendix 5)

Market Simulation

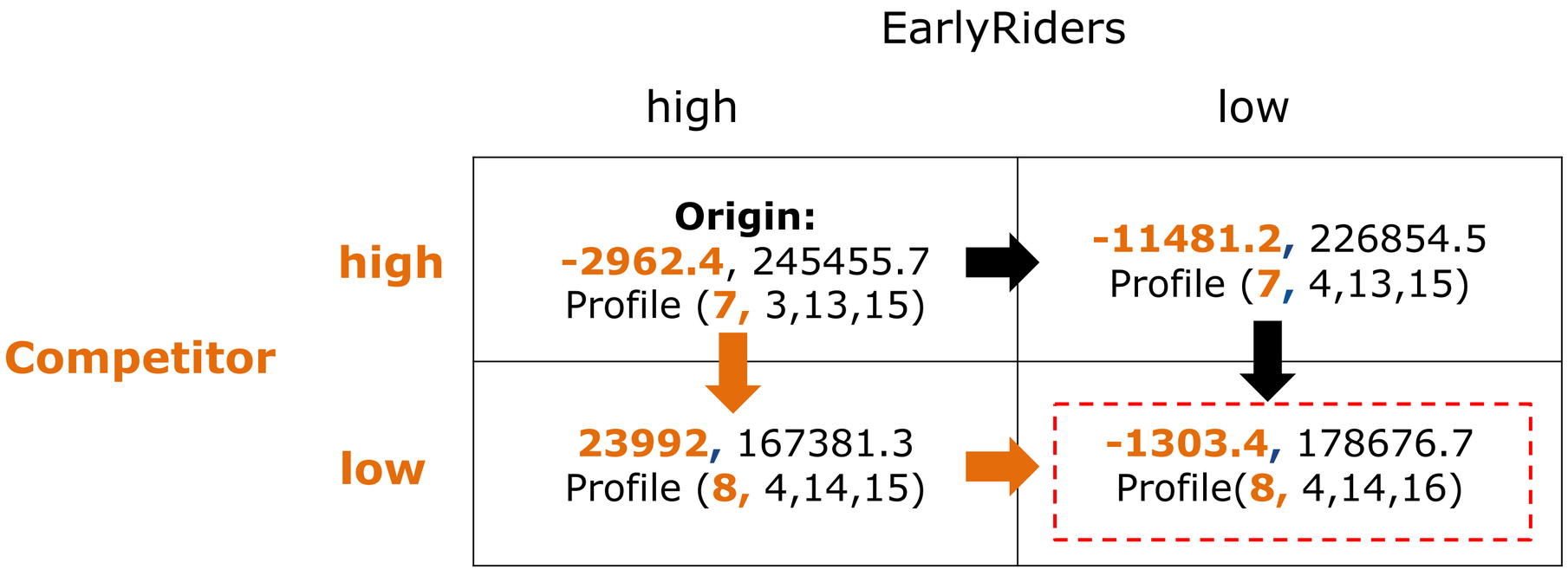
$111.99 wholesale price for both competitor and EarlyRiders

Scenario	Products	Market share	Profit(EarlyRider)
Current situation	EarlyRider: $139.99/18"/Rocking/Racing (Profile 5) $139.99/18"/Rocking/Glamour (Profile 13) Competitor: $139.99/26"/Rocking/Racing (Profile 7)	EarlyRider: 22% 21% Competitor: 57%	$ 95,862.8
Scen1	EarlyRider: **$139.99/18"/Rocking/Racing (Profile 3)** **$139.99/18"/Rocking/Glamour (Profile 13)** **$139.99/18"/Rocking/Glamour (Profile 15)** Competitor: $139.99/26"/Rocking/Racing (Profile 7)	EarlyRider: 38.5% 21% 34.5% Competitor: 6%	$ **218,789.1**
Scen2	EarlyRider: $139.99/26"/Bouncing/Racing (Profile 3) $139.99/18"/Rocking/Glamour (Profile 15) Competitor: $139.99/26"/Rocking/Racing (Profile 7)	EarlyRider: 38.5% 44.5% Competitor: 17%	$ 200,833.5
Scen3	EarlyRider: $139.99/18"/Rocking/Glamour (Profile 3) $139.99/26"/Rocking/Glamour (Profile 13) Competitor: $139.99/26"/Rocking/Racing (Profile 7)	EarlyRider: 41.5% 31% Competitor: 27.5%	$ 189,044.3
Scen4	EarlyRider: $139.99/26"/Bouncing/Racing (Profile 13) $139.99/26"/Rocking/Glamour (Profile 15) Competitor: $139.99/26"/Rocking/Racing (Profile 7)	EarlyRider: 21% 39% Competitor: 40%	$ 130, 429.3

***In this case, we assume that our competitor do not drop price. Then Scen1 is our best option. We have more simulations based on different marketing reactions. See Appendix 3.**

Market Simulation

- What if competitor respond to the product change?



Under the scenario, the competitor is at loss, thus they will definitely lower the price to gain higher profit.

The market will always end up low-low price to reach equilibrium.

*In this case, we assume our competitor has a quick response and lower price, the market reach equilibrium in low-low price.

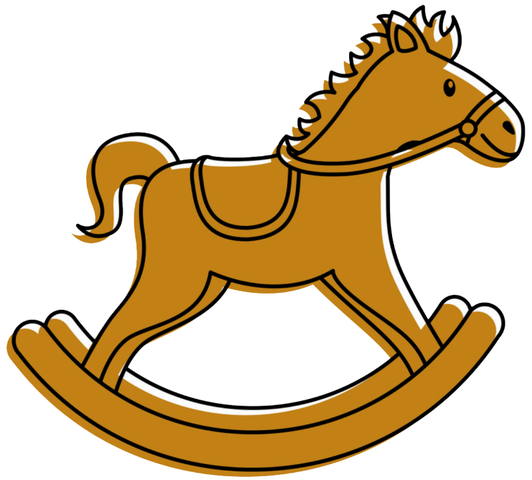
Market Simulation

$95.99 wholesale price for both competitor and EarlyRiders

Under low-low price scenario, the same product portfolio still perform the best (only change the price)

Scenario	Products	Market share	Profit(EarlyRider)
Current situation	EarlyRider: $139.99/18"/Rocking/Racing (Profile 5) $139.99/18"/Rocking/Glamour (Profile 13) Competitor: $139.99/26"/Rocking/Racing (Profile 7)	EarlyRider: 22% 21% Competitor: 57%	$ 95,862.8
Scen1	EarlyRider: **$119.99/18"/Rocking/Racing (Profile 4)** **$119.99/18"/Rocking/Glamour (Profile 14)** **$119.99/26"/Rocking/Glamour (Profile 16)** Competitor: $119.99/26"/Rocking/Racing (Profile 8)	EarlyRider: 35.5% 22% 34% Competitor: 8.5%	$ **152010.1**
Scen2	EarlyRider: $119.99/26"/Bouncing/Racing (Profile 4) $119.99/18"/Rocking/Glamour (Profile 14) Competitor: $119.99/26"/Rocking/Racing (Profile 8)	EarlyRider: 40% 26.5% Competitor: 33.5%	$ 127286.7
Scen3	EarlyRider: $119.99/18"/Rocking/Glamour (Profile 14) $119.99/26"/Rocking/Glamour (Profile 16) Competitor: $119.99/26"/Rocking/Racing (Profile 8)	EarlyRider: 23% 36.5% Competitor: 40.5%	$ 91569.5
Scen4	EarlyRider: $119.99/26"/Bouncing/Racing (Profile 4) $119.99/26"/Rocking/Glamour (Profile 16) Competitor: $119.99/26"/Rocking/Racing (Profile 8)	EarlyRider: 35.5% 46.5% Competitor: 18%	$ 144073. 9

*We have more simulations based on different marketing reactions. See Appendix 4.



Toy Horse Conjoint Analysis

MSMA Team 13
SIMON BUSINESS SCHOOL

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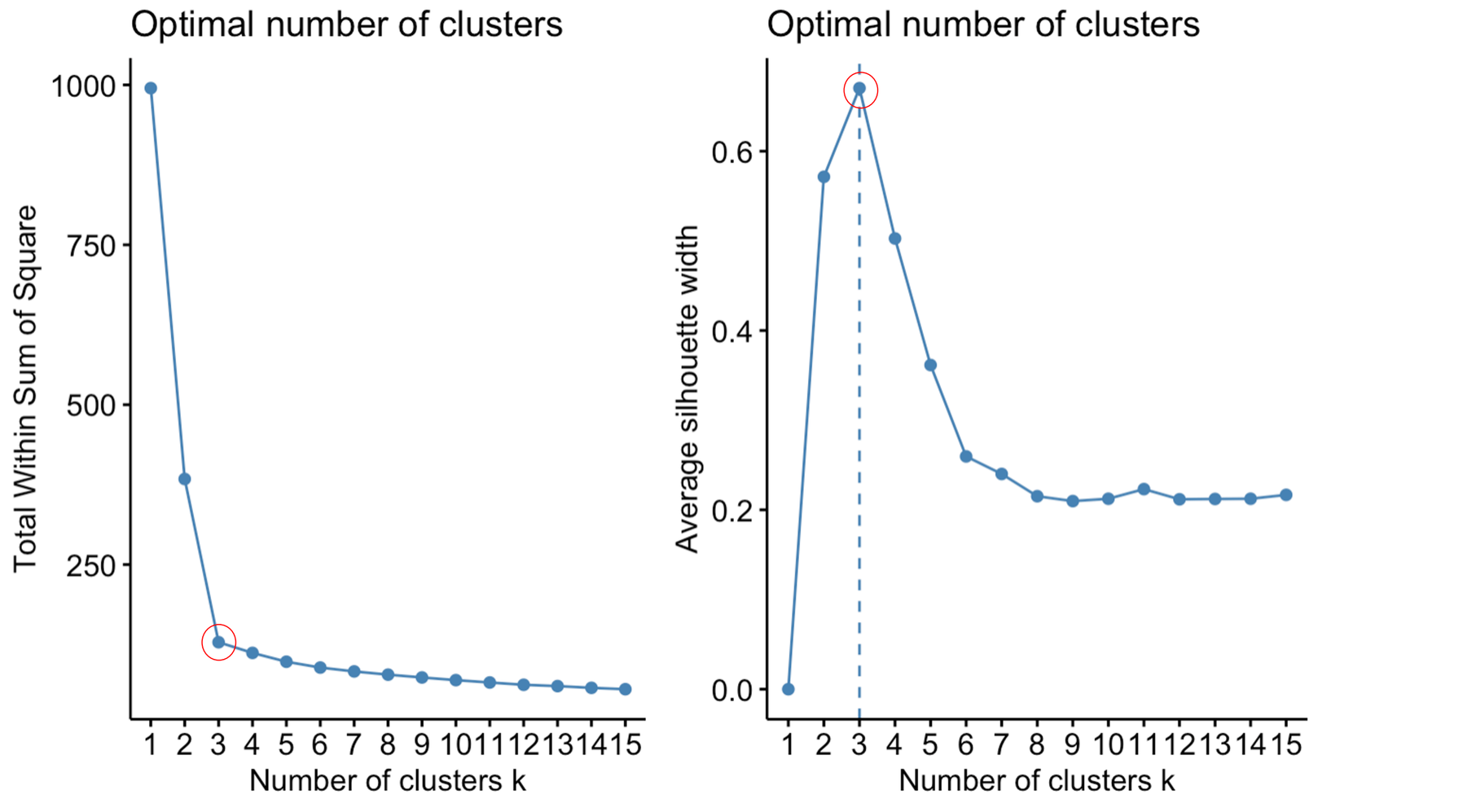
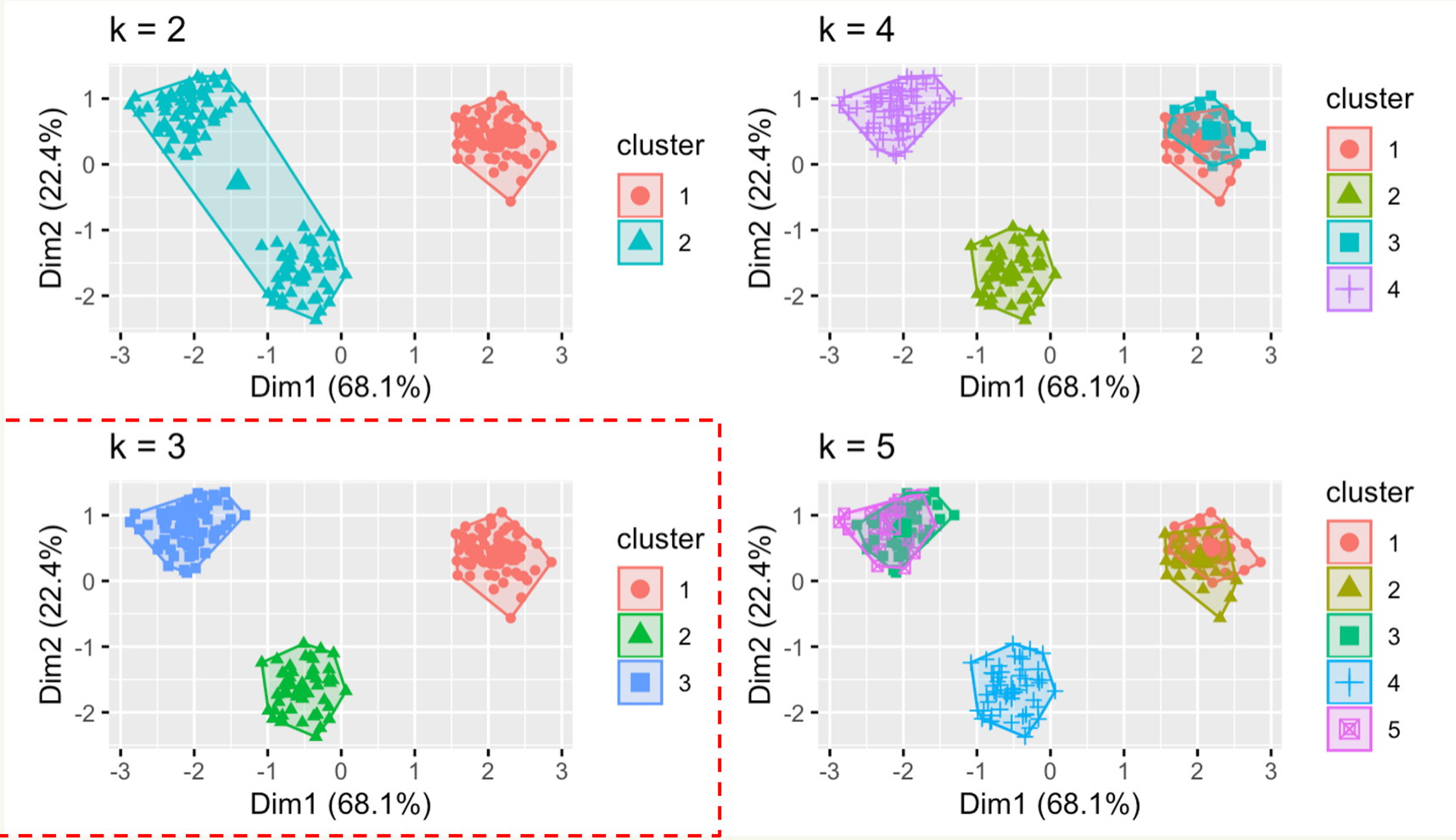
Xiao Yang

Appendix 1-Optimal Number of Clusters



Appendix 2 - Optimal Clusters



Appendix 3 - Market Simulation

Competitor’s whole sale price=$111.99, Profile 3,13,15 is our best option to maximize profit

Current profile (7, 5, 13)

our profit: 95862.8

competitor’s profit: 141857.2

scenario	profile7	profile3	profile13	profile15	ourProfit	profitCompet
1	0.06	0.385	0.21	0.345	**218,789.1**	-2962.4
2	0.17	0.385		0.445	200,833.5	28273.2
3	0.275	0.415	0.31		189,044.3	58089
4	0.4		0.21	0.39	130, 429.3	93584

Assumption:

- When there is a tie in the first choice, we split the choice possibility equally.
- Competitors' cost structure is the same with ours.
- Only allow product line change once per year.
- There is no cost for dropping products.

Appendix 3 - Market Simulation

Different product portfolio when competitor doesn't lower price; profile 3,13,15 is the optimal.

scenario	profile7	profile3	profile4	profile13	profile14	profile15	profile16	ourProfit	profitCompet
1	**0.06**	**0.385**		**0.21**		**0.345**		**218789.066666667**	**-2962.4**
21	0.095		0.52			0.385		195330.466666667	6976.2
22	0.005	0.035					0.96	169446.866666667	-18580.2
23	0		0.405				0.595	186066.666666667	-20000
24	0.145		0.65	0.205				192279.133333333	21174.2
25	0.09	0.185			0.725			197416.933333333	5556.4
26	0.055		0.52		0.425			199755.533333333	-4382.2
27	0.025				0.675	0.3		208594.333333333	-12901
28	0.005			0.05			0.945	176993.533333333	-18580.2
29	0.005				0.3		0.695	181793.533333333	-18580.2
30	0.03		0.48	0.18		0.31		200187.866666667	-11481.2
31	0.02	0.18			0.5	0.3		197587.466666667	-14320.8
32	0.005	0.035		0.05			0.91	154246.866666667	-18580.2
33	0.01		0.435		0.28	0.275		191867.066666667	-17160.4
34	0		0.405	0.05			0.545	170866.666666667	-20000
35	0.005	0.035			0.3		0.66	159046.866666667	-18580.2
36	0		0.4		0.25		0.35	173826.666666667	-20000

Appendix 4 - Market Simulation

Different product portfolio when competitor drop price to $95.99; Profile 4,14,16 is the optimal.

scenario	profile8	profile3	profile4	profile13	profile14	profile15	profile16	profit	profitCompet
5	0.71	0.005		0.065		0.22		11335.0666666667	136171.6
6	0.77	0.005				0.225		12217.4666666667	149369.2
7	0.93	0.005		0.065				-24469.4666666667	184562.8
8	0.715			0.065		0.22		36341.9333333333	137271.4
9	0.345		0.375	0.065		0.215		108740.466666667	55886.2
10	0.545	0			0.245	0.21		48028.4666666667	99878.2
11	0.495	0		0.035			0.47	41106.4666666667	88880.2
12	0.405	0			0.23		0.365	64902.8666666667	69083.8
13	0.17		0.355	0.035			0.44	129633.466666667	17393.2
14	0.2		0.37		0.225	0.205		140714.666666667	23992
15	0.405		0.375			0.22		109622.866666667	69083.8
16	0.505	0					0.495	55546.8666666667	91079.8
17	0.52		0.415	0.065				85074.1333333333	94379.2
18	0.7	0			0.3			28921.3333333333	133972
19	0.495			0.035			0.47	67773.1333333333	88880.2
20	0.545				0.245	0.21		74695.1333333333	99878.2
37	**0.085**		**0.355**		**0.22**		**0.34**	**152010.066666667**	**-1303.4**
38	0.335		0.4		0.265			127286.733333333	53686.6
39	0.405				0.23		0.365	91569.5333333333	69083.8
40	0.18		0.355				0.465	144073.866666667	19592.8

Appendix 5 - Statistic Test

```
Call:
lm(formula = ratings ~ (price + size + motion + style) * age,
    data = fulldf)

Residuals:
    Min      1Q  Median      3Q     Max
-43.528 -12.886  -1.307  12.388  44.386

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  39.5462     1.0867  36.390  < 2e-16 ***
price        14.4133     1.0183  14.154  < 2e-16 ***
size          3.8532     0.9749   3.952 7.97e-05 ***
motion        2.7950     0.9749   2.867  0.00418 **
style         1.1867     0.9749   1.217  0.22367
age          -1.2982     1.5292  -0.849  0.39601
price:age     1.2588     1.4330   0.878  0.37977
size:age      4.1708     1.3720   3.040  0.00239 **
motion:age   -3.1188     1.3720  -2.273  0.02310 *
style:age    -0.0857     1.3720  -0.062  0.95020
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 16.55 on 2390 degrees of freedom
Multiple R-squared:  0.2069,    Adjusted R-squared:  0.204
F-statistic:  69.3 on 9 and 2390 DF,  p-value: < 2.2e-16
```

P-value >5%, therefore we can reject the null hypothesis that there are significant differences in preference between age groups in terms of price and style.

We can see two groups prefer the same style and motion.