enginius
MARKETING ENGINEERING ONLINE

Enginius

Sentiment Analysis

Riddhi Dave, The University of Tampa

Sentiment options

Options selected

Option	Selection
Data source	Sentiment data
Verbatim	Verbatim
Include date	Yes
Include rating	No
Word co-occurrence analysis and RAKE	Yes
Topic model	No
Default stop words	No default stop words
Custom stop words	No
Date and time	2023-11-12 06:07:47 UTC

Options selected.

Data description

	Data	Number of Rows	Number of columns	Column names
1	Sentiment data	1000	4	C0, Name, Verbatim, Date

Data description.

Word cloud

Word cloud of the most frequent words

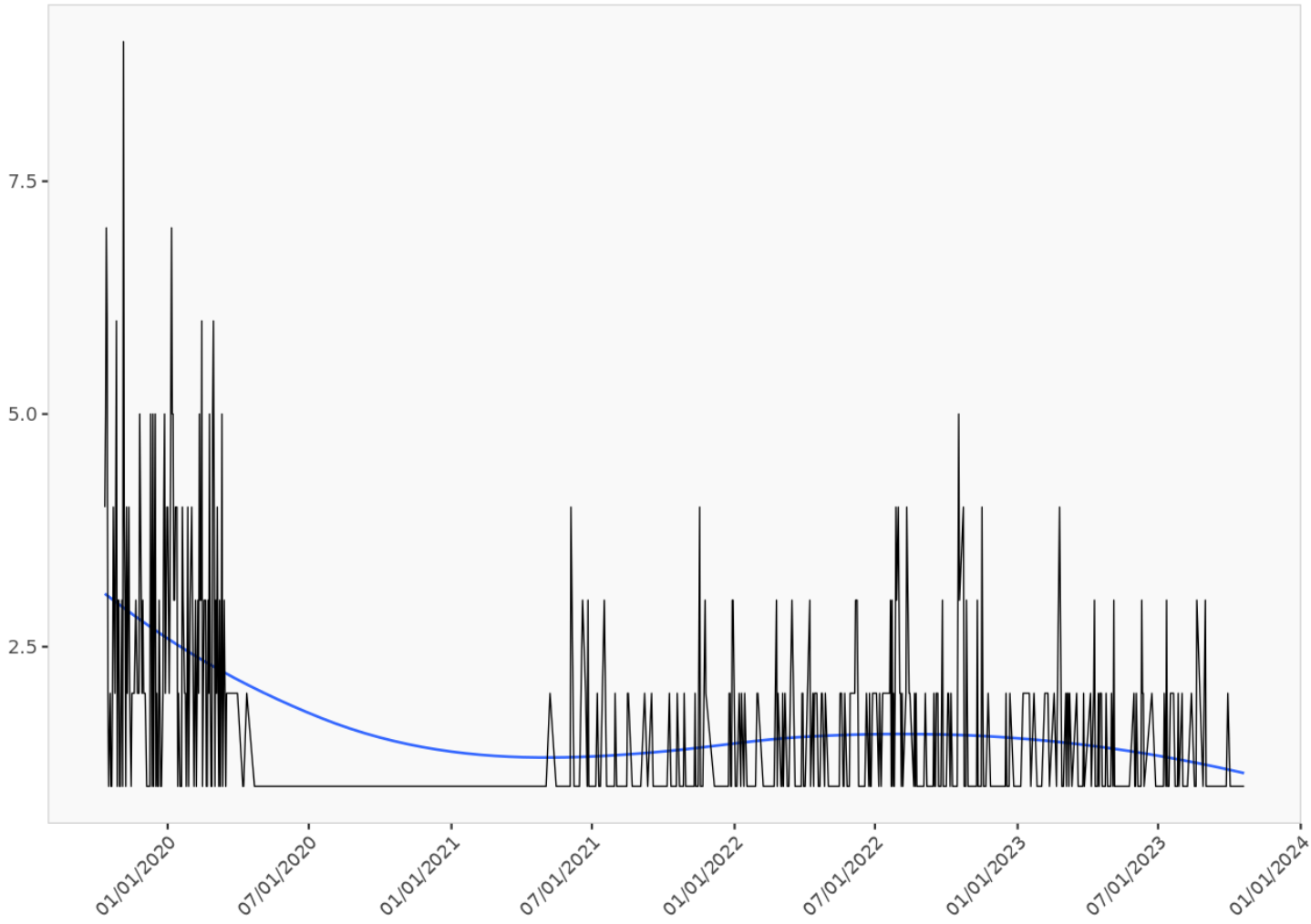
Word cloud. The word cloud represents the most frequently used words inside the corpus of texts provided. The bigger a word appears, the larger the number of times it occurs in the text corpus.

Word cloud of the most frequent words (without stemming)

Word cloud without stemming. The word cloud represents the most frequently used words inside the corpus of texts provided. The bigger a word appears, the larger the number of times it occurs in the text corpus.

Sentiment analysis overview

Post frequency



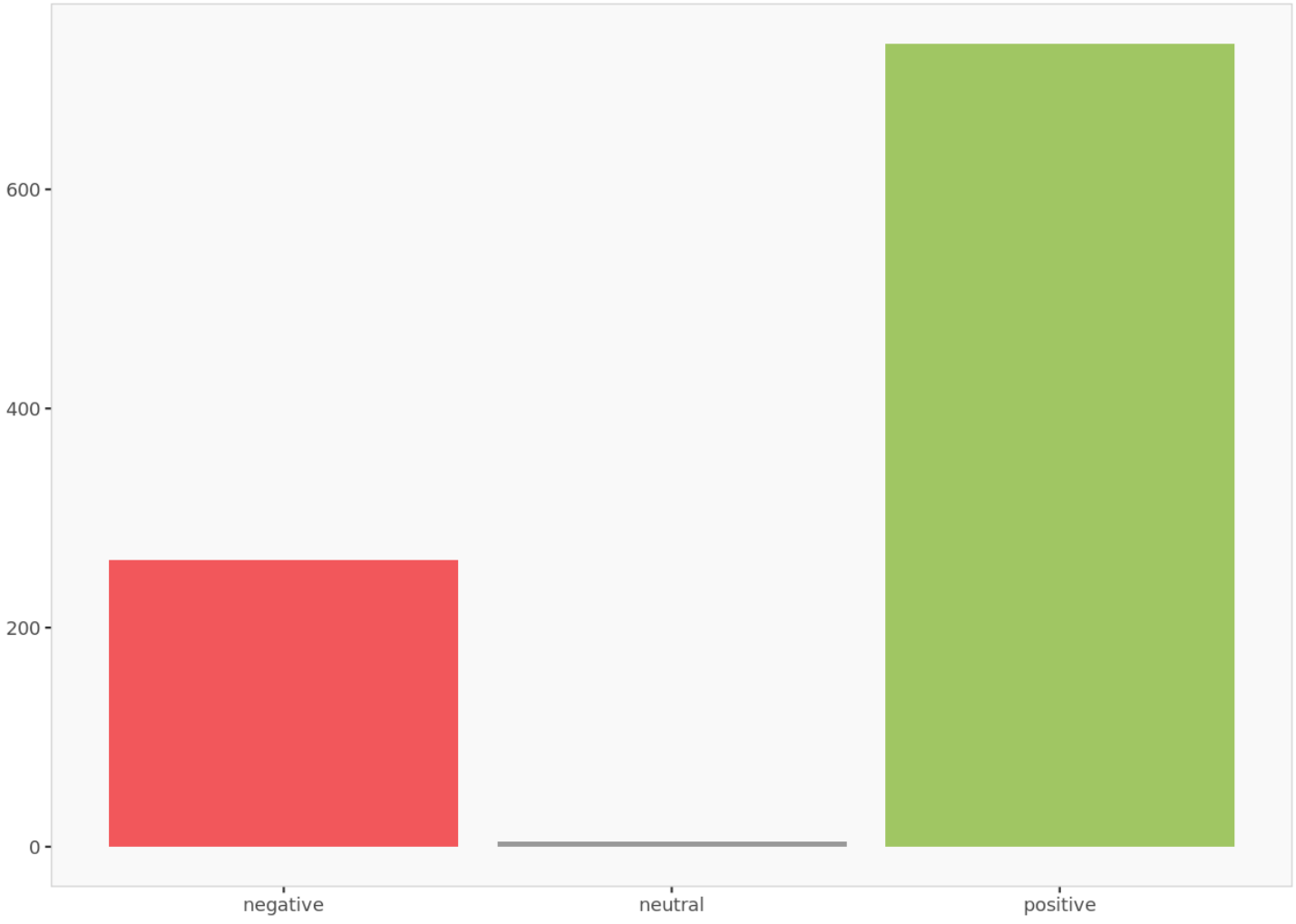
Post frequency. The post frequency graph indicates the daily frequency of posts. The blue smoothing line helps visualize the trend.

Valence analysis

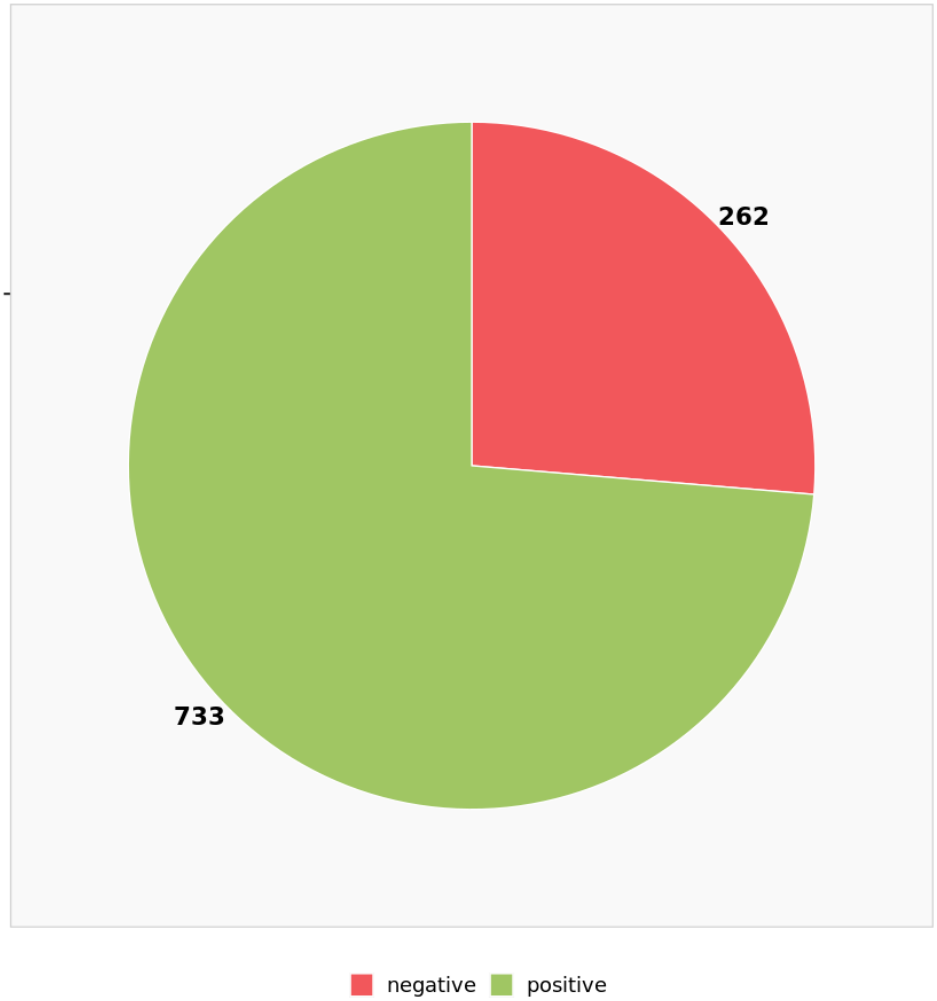
Valence repartition

	Posts count	Relative posts count
Total	1 000	100%
negative	262	26%
neutral	5	1%
positive	733	73%

Valence repartition. The number of posts that fall into different valence categories summarized by their absolute and relative values.

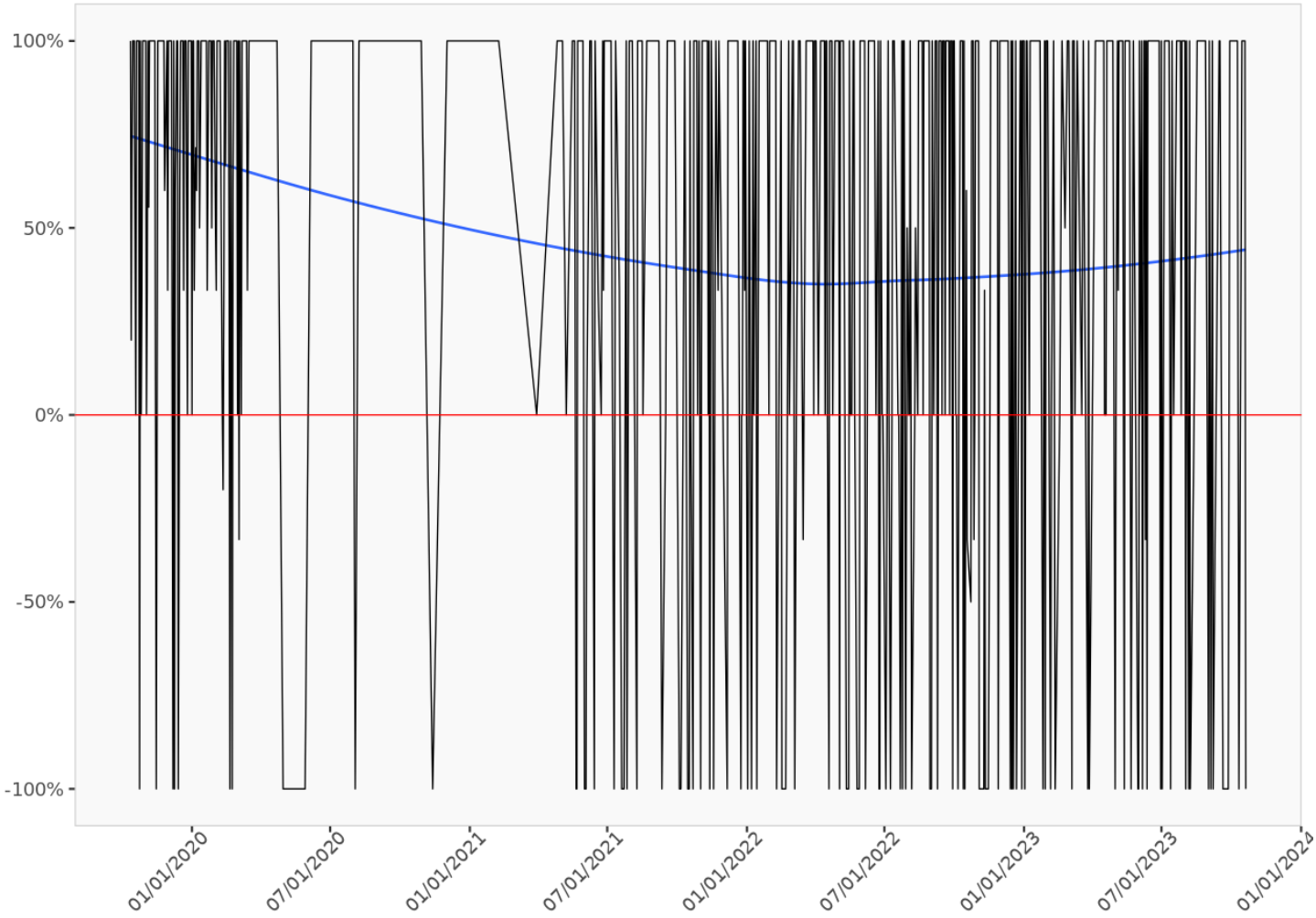


Valence histogram. The valence histogram indicates the number of posts by their valence.



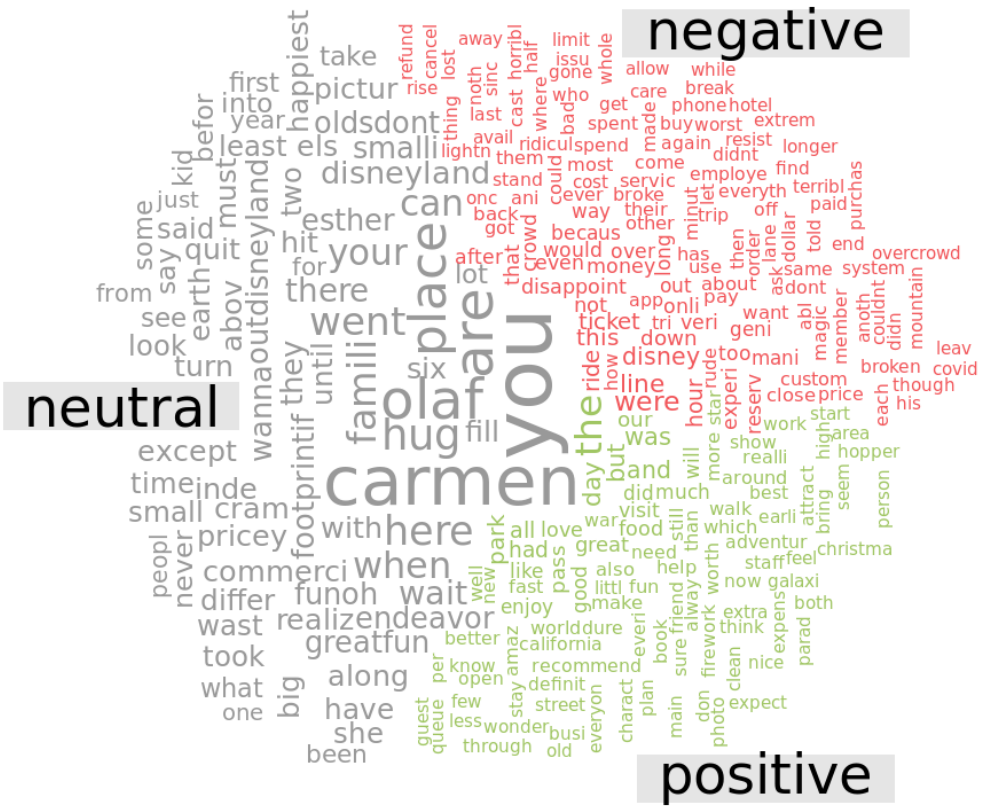
Valence distribution without uncategorized posts. Graphic summary of the relative sizes of the number of posts classified by valence after ignoring posts that could not be categorized (i.e., neutral posts).

Valence evolution



Post valence ratio. The post valence ratio graph indicates the daily average number of positive posts. The blue smoothing line helps visualize the trend.

Valence word cloud



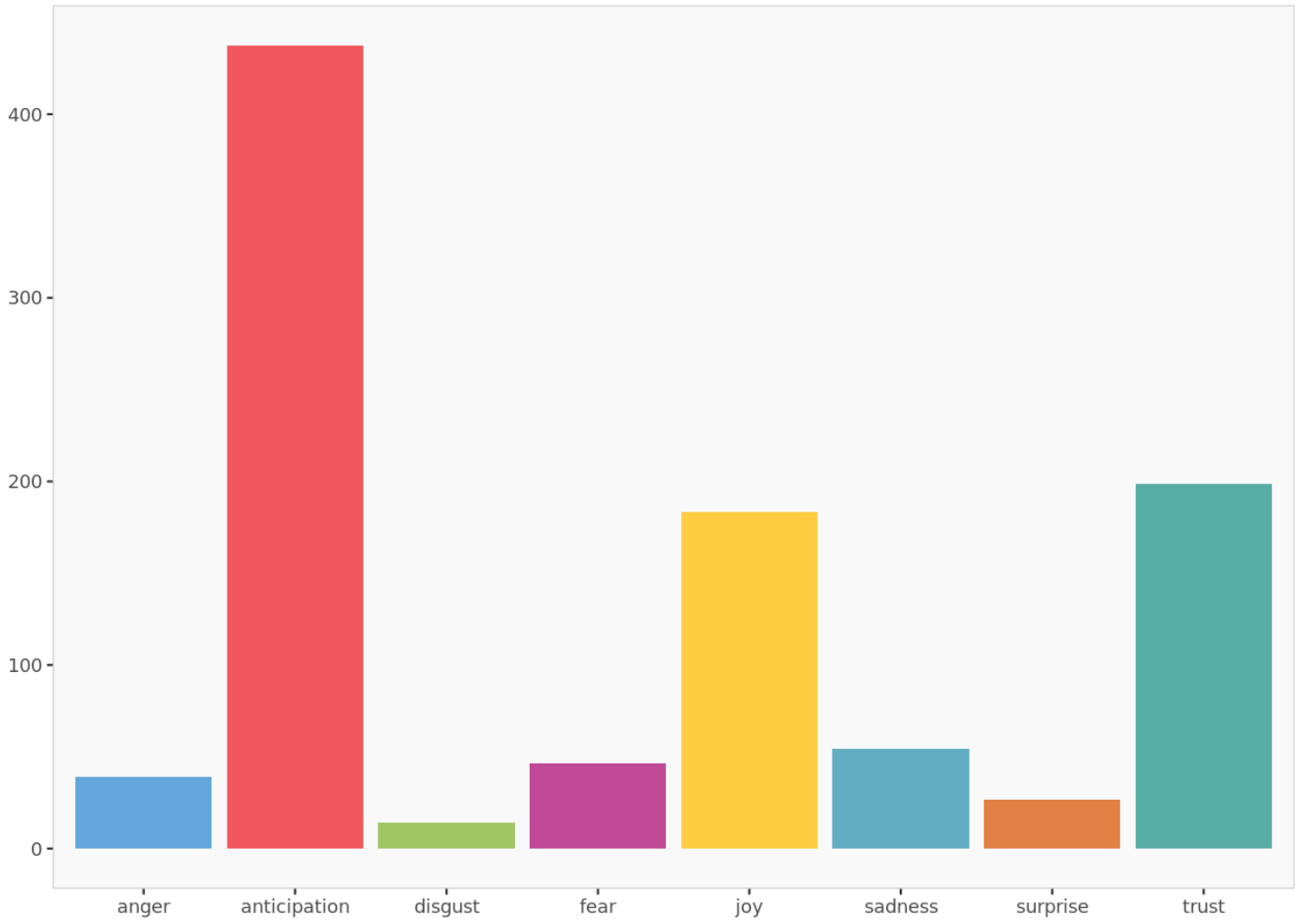
Valence word cloud.

Emotion analysis

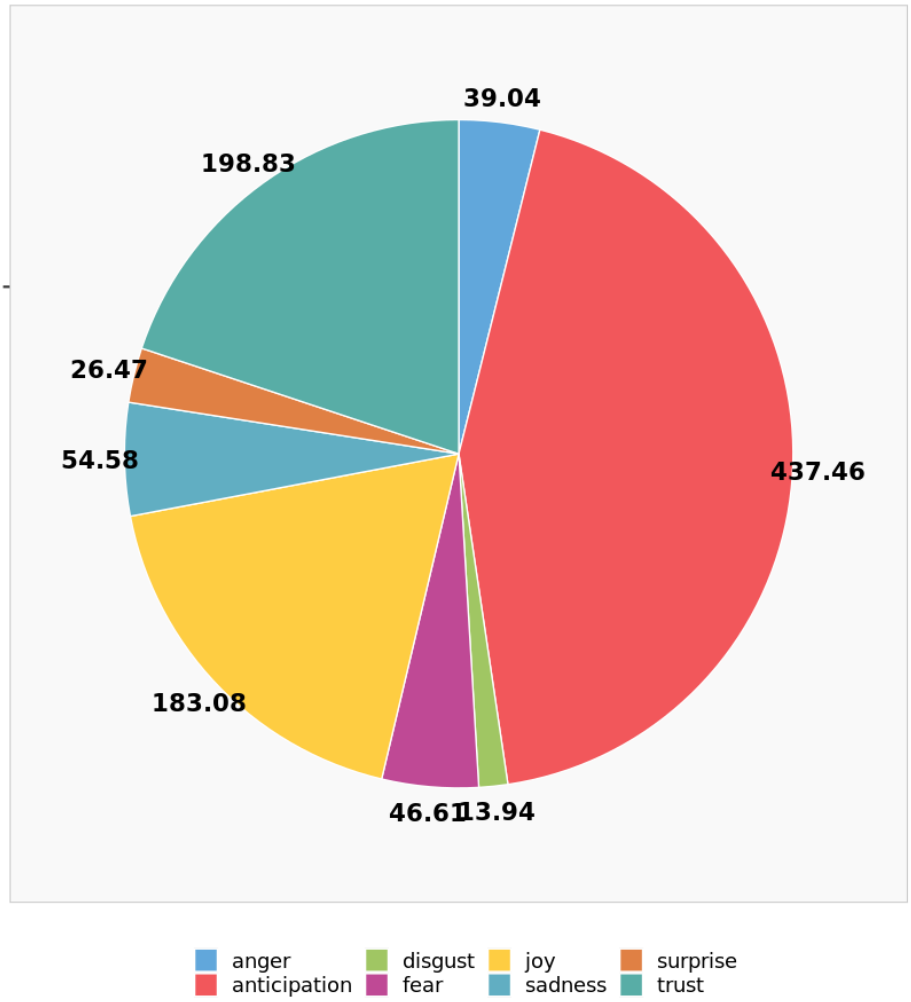
Emotion repartition

	Posts count	Relative posts count
Total	1 000.00	100%
anger	39.04	4%
anticipation	437.46	44%
disgust	13.94	1%
fear	46.61	5%
joy	183.08	18%
sadness	54.58	5%
surprise	26.47	3%
trust	198.83	20%

Emotion repartition. The number of posts that fall into different emotion categories summarized by their absolute and relative values. If a post has multiple emotions, then it is equally divided among those emotions.

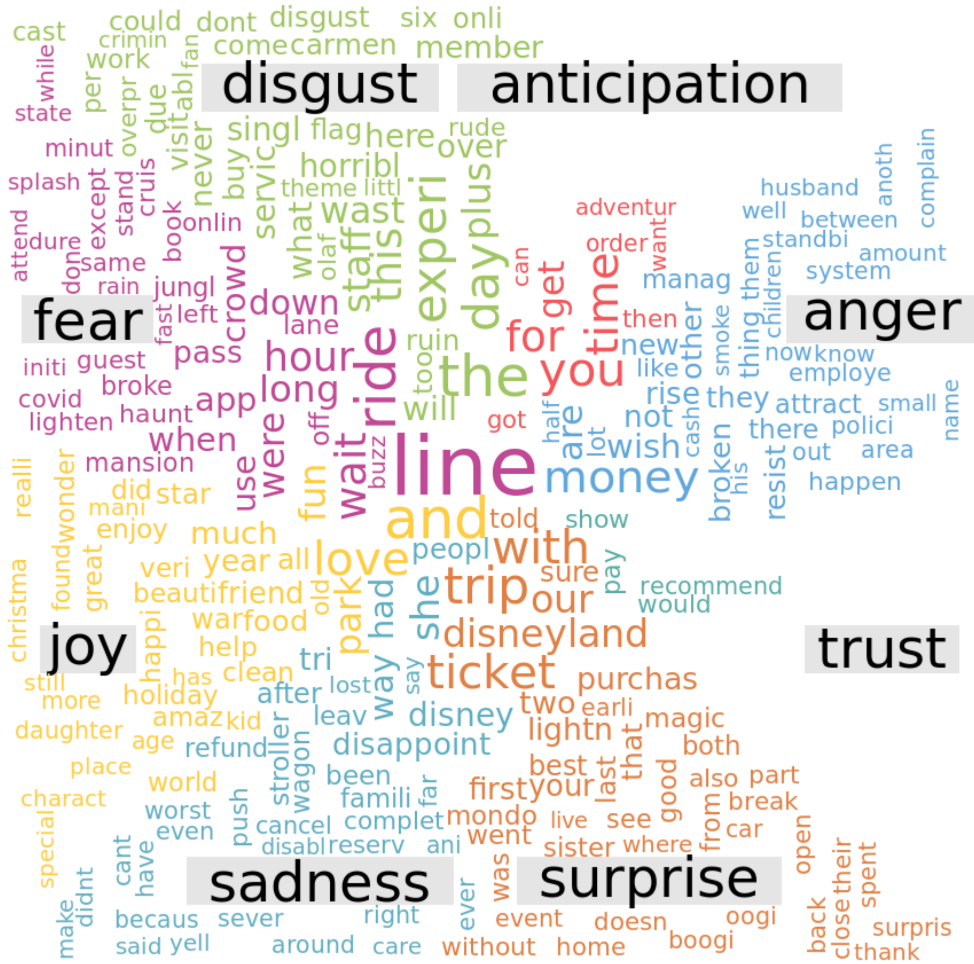


Emotion histogram. The emotion histogram indicates the number of posts by their emotion.



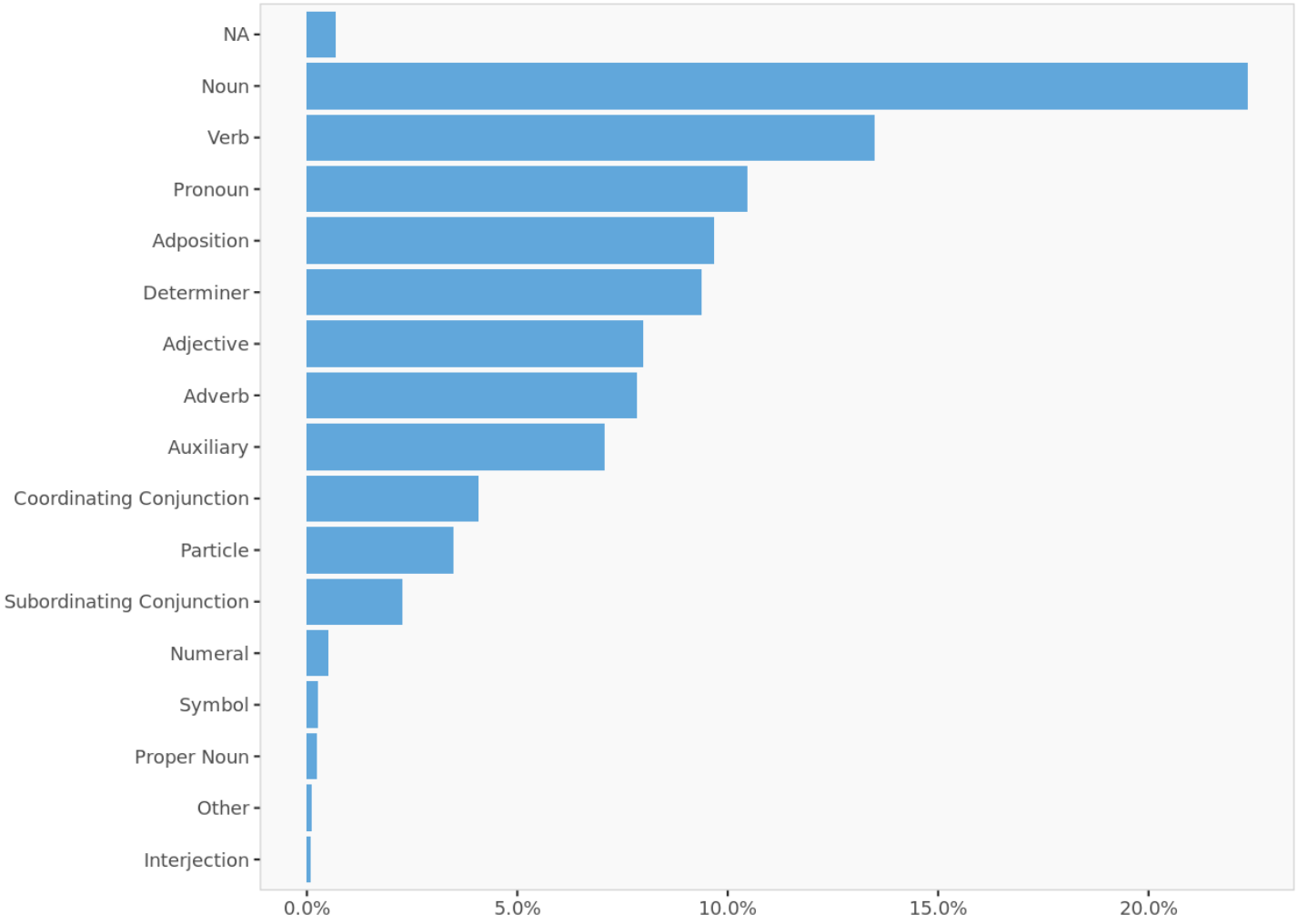
Emotion distribution without uncategorized posts. Graphic summary of the relative sizes of the number of posts classified by emotion after ignoring uncategorized posts.

Emotion word cloud



Emotion word cloud. Even if a post has multiple emotions its words will be shown only in one of those emotions.

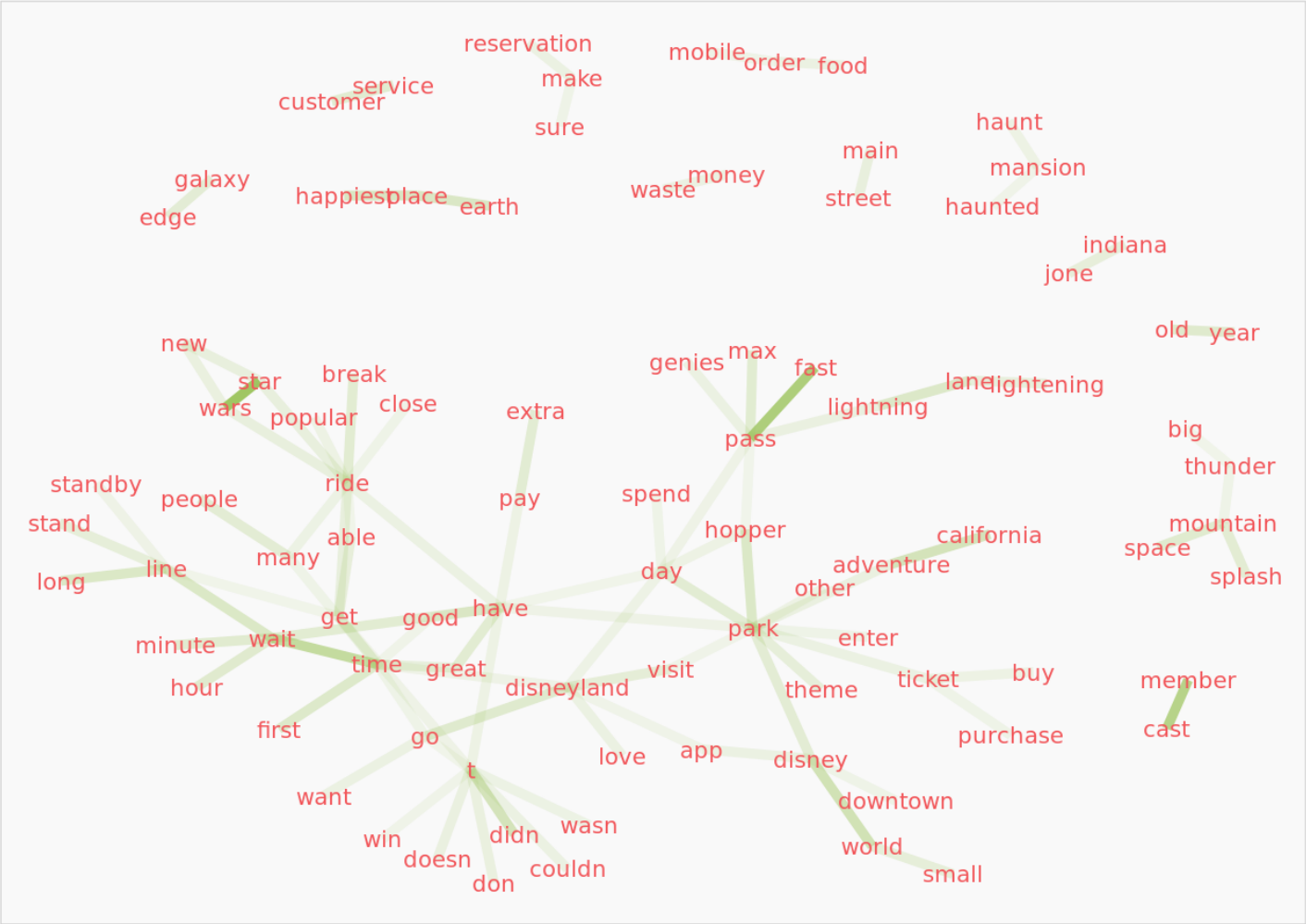
Distribution of Universal Parts of Speech Tags



Distribution of Universal Parts of Speech Tags.

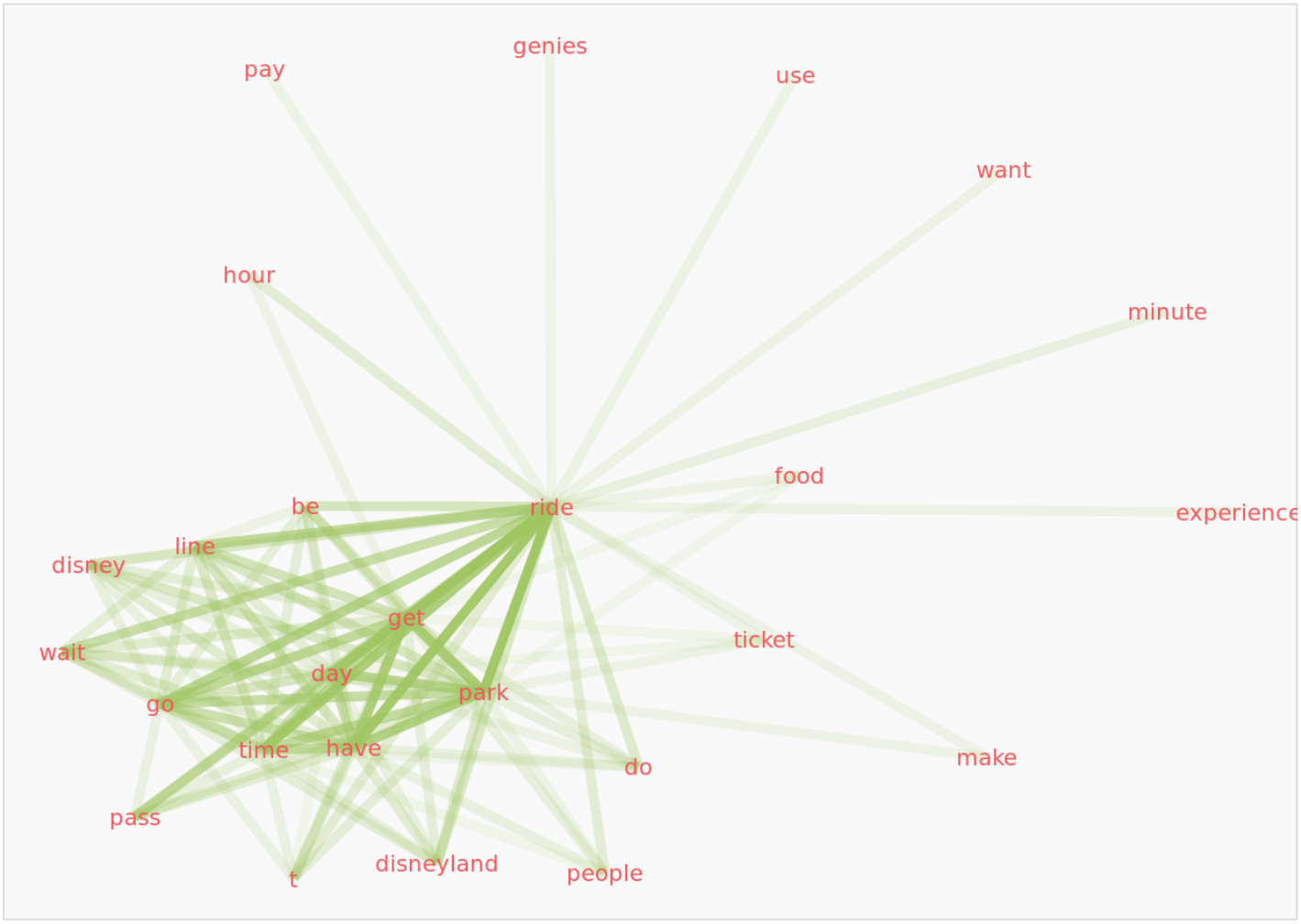
Graph of Word Co-Occurrences

Word co-occurrences between adjacent words in a corpus



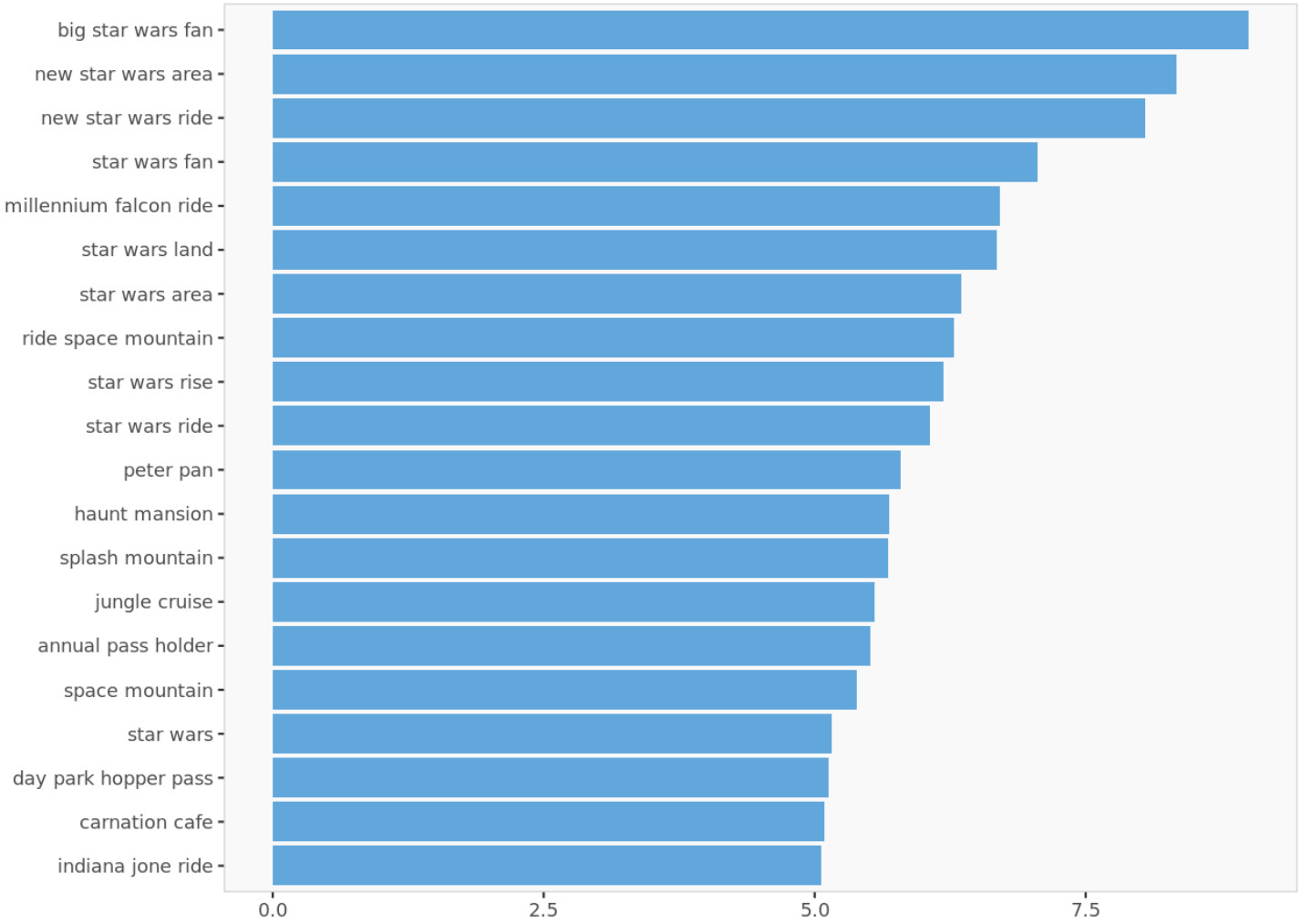
Includes Nouns, Verbs and Adjectives (retains custom stop-words).

Word co-occurrences within documents in a corpus



Includes Nouns, Verbs and Adjectives (retains custom stop-words).

RAKE Analysis (Rapid Automatic Keyword Extraction) -- Keywords with highest RAKE values



Keywords with highest RAKE values. The top keywords (i.e., contiguous sequence of words ignoring irrelevant words) were identified with minimum frequency of occurrences set to 0.01% of total word count.

enginius
MARKETING ENGINEERING ONLINE

Enginius

Positioning Analysis

Bhavya Priya Akula, The University of Tampa

Table of Contents

Positioning options

Options selected

Option	Selection
Include preferences	Yes
Number of dimensions	3
Focal brand	Disney Theme Parks
Show segments of preferences	No
Number of segments	Automatic
Decision rule	First-Choice
Current market shares	No
Date and time	2023-11-26 16:13:20 UTC

Options selected.

Data description

	Data	Number of Rows	Number of columns	Column names
1	Perceptual data	7	7	C0, Disney Theme Parks, Six Flags, HersheyPark, Universal Studios, ...
2	Preference data	80	7	C0, Disney Theme Parks, Six Flags, HersheyPark, Universal Studios, ...

Data description.

Dimensions

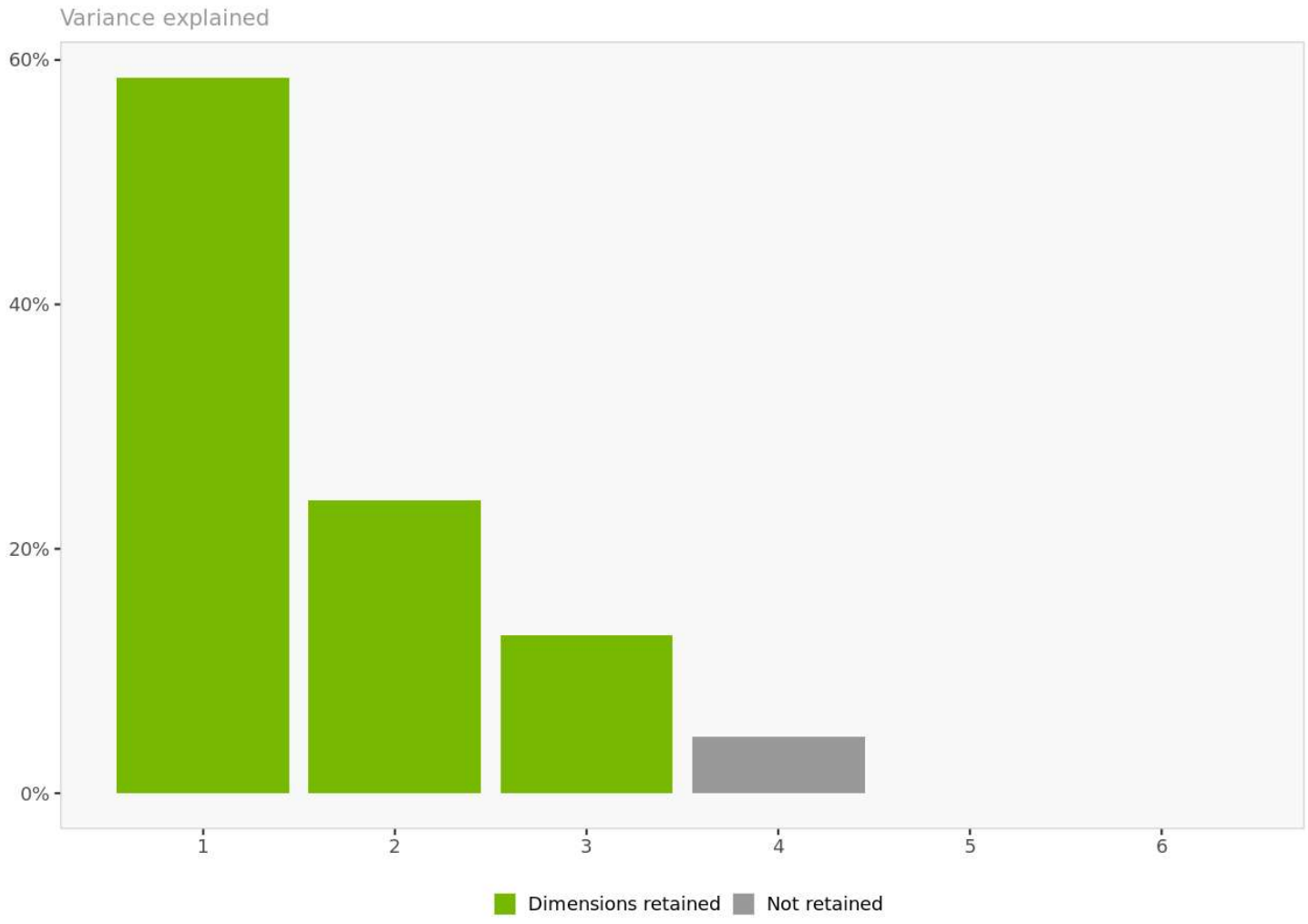
Number of dimensions retained

You have decided to display the first 3 dimensions, which account for a total of 95.4% of the variance in the data.

	Variance explained	Cumulative variance
Dimension 1	58.6%	58.6%
Dimension 2	24.0%	82.5%
Dimension 3	12.9%	95.4%
Dimension 4	4.6%	100.0%
Dimension 5	0.0%	100.0%
Dimension 6	0.0%	100.0%

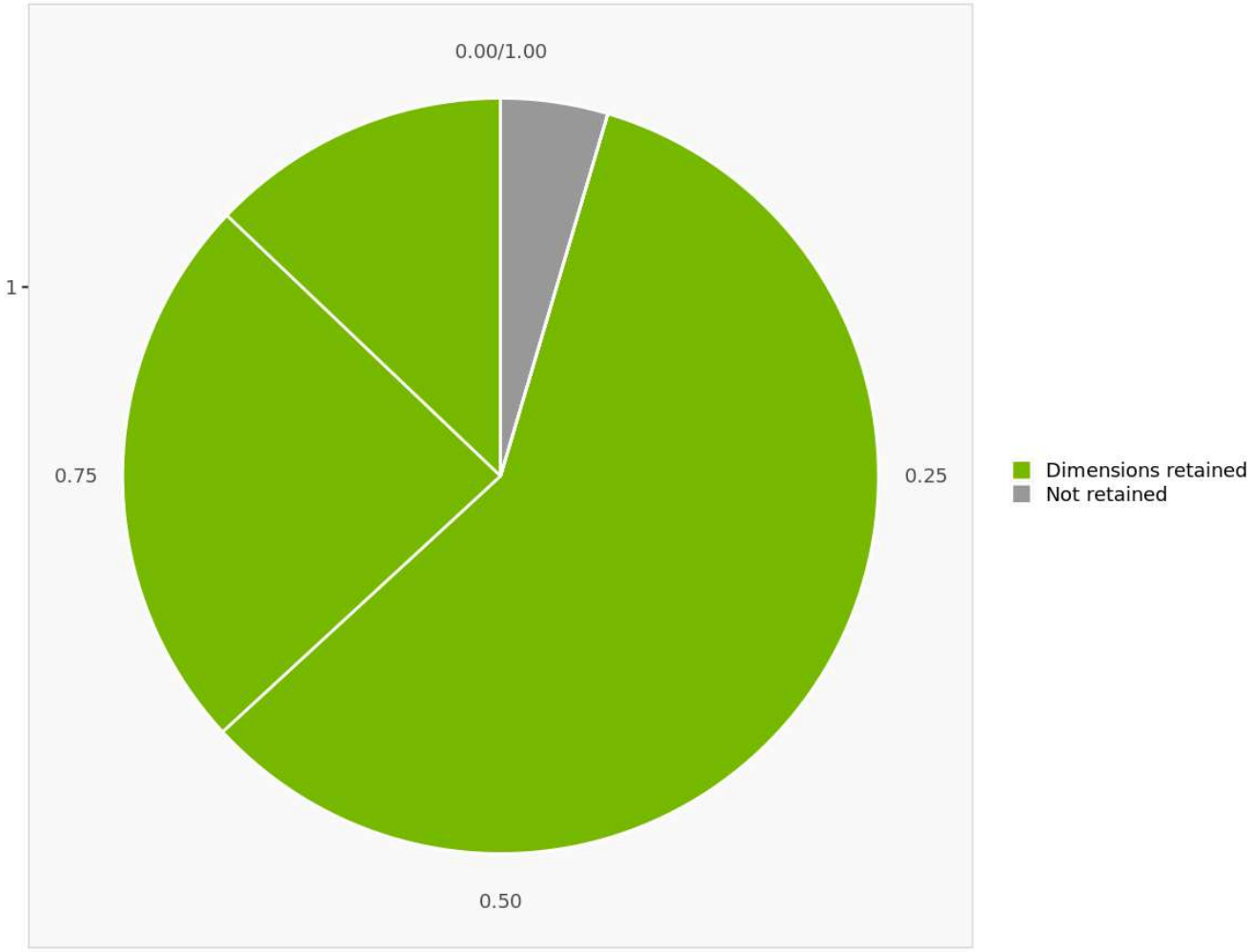
Variance explained. Variance and cumulated variance explained, by dimension.

Variance explained



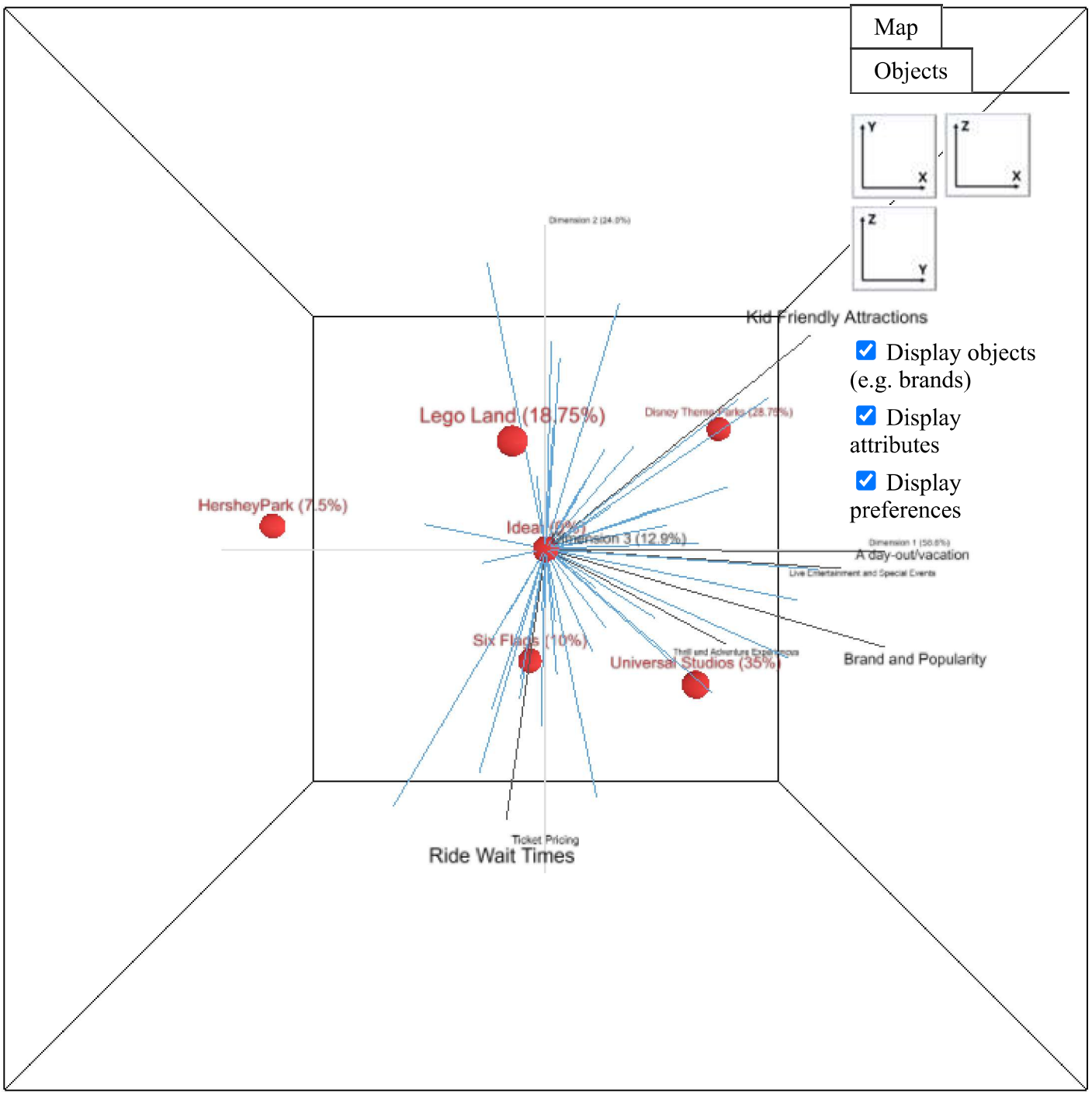
Variance explained. Each additional dimension captures a decreasing portion of the variance found in the original data.

Cumulative variance explained



Cumulative variance explained. The first 3 dimensions account for 95.4 % of the variance in the data.

3D visualization



Visualization in 3D of the perceptual map. To rotate the map, holds the left mouse button down and move it around.

Objects

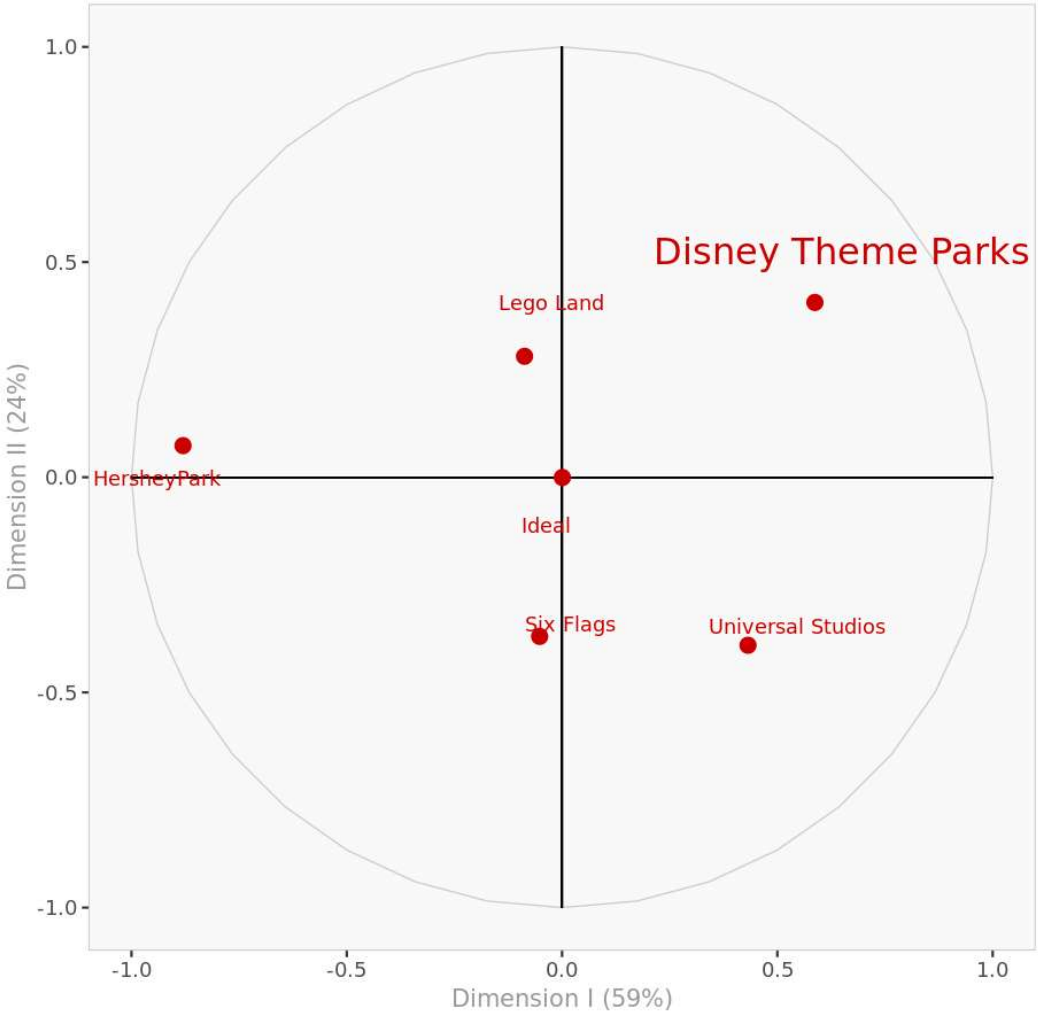
Interpretation

In this section, only the objects (e.g., brands) are displayed on the perceptual map.

In interpreting the map, remember that the closer two objects are, the more similar they are perceived to be, that is, the more similar they rate on the underlying attributes.

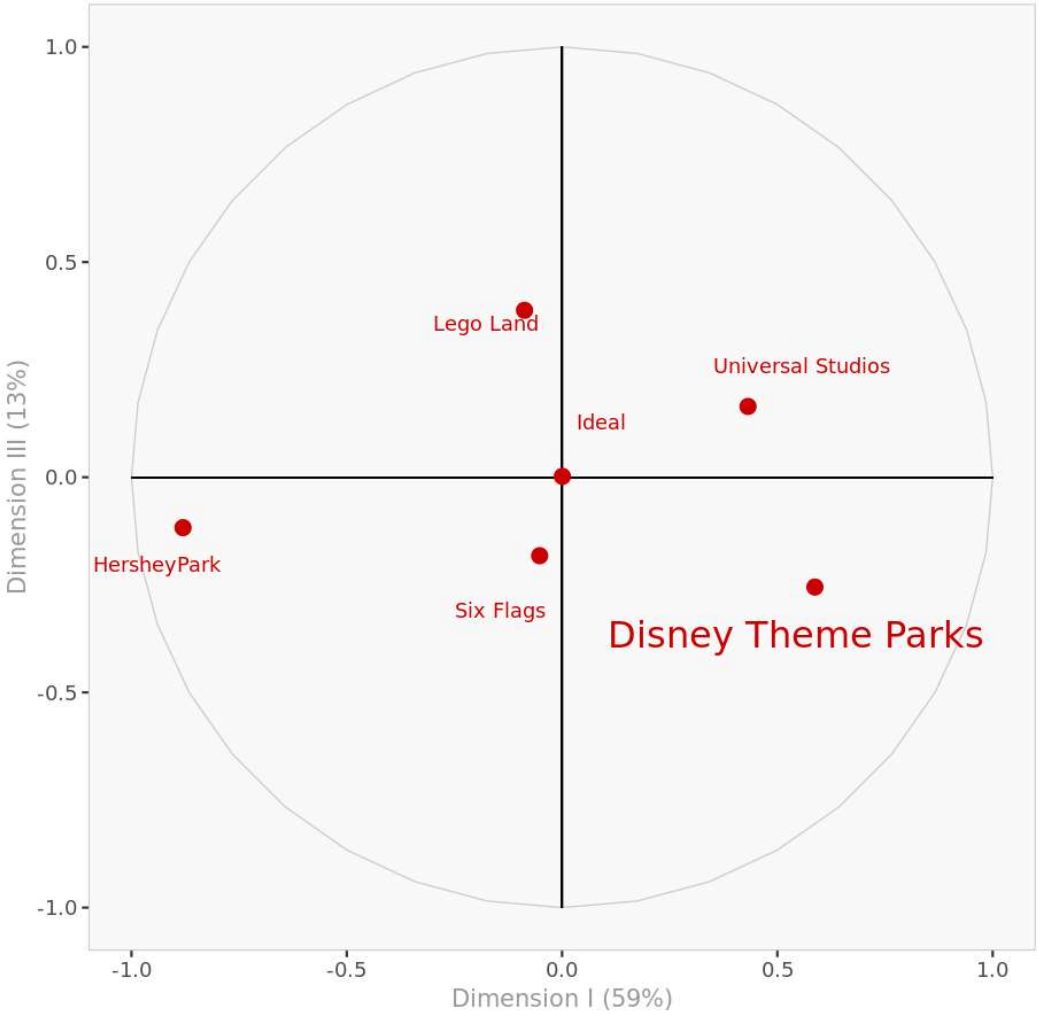
Since the first 3 dimensions of the perceptual map have been retained, the map can be seen as a cube in 3 dimensions. Each view displays the cube seen from a different angle.

Dimensions I-II



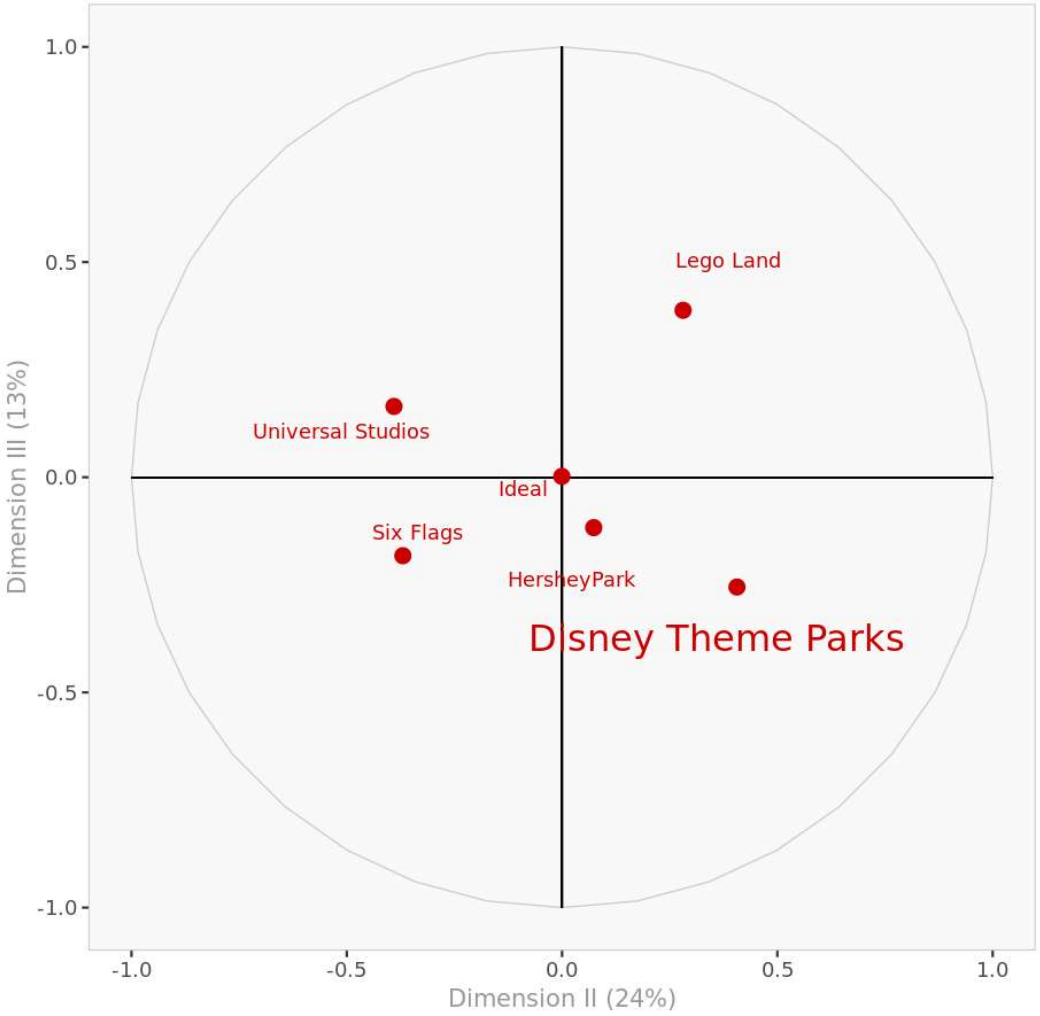
Objects I-II. Object position on the first and second dimensions of the perceptual map.

Dimensions I-III



Objects I-III. Object positions on the first and third dimensions of the perceptual map.

Dimensions II-III



Objects II-III. Object positions on the second and third dimensions of the perceptual map.

Coordinates

	Dimension I	Dimension II	Dimension III
Disney Theme Parks	0.587	0.406	-0.255
Six Flags	-0.052	-0.370	-0.182
HersheyPark	-0.880	0.073	-0.117
Universal Studios	0.432	-0.390	0.165
Lego Land	-0.087	0.281	0.388
Ideal	0.001	-0.001	0.002

Object coordinates. Displays the coordinates of all the objects in every dimension.

Attributes

Interpretation

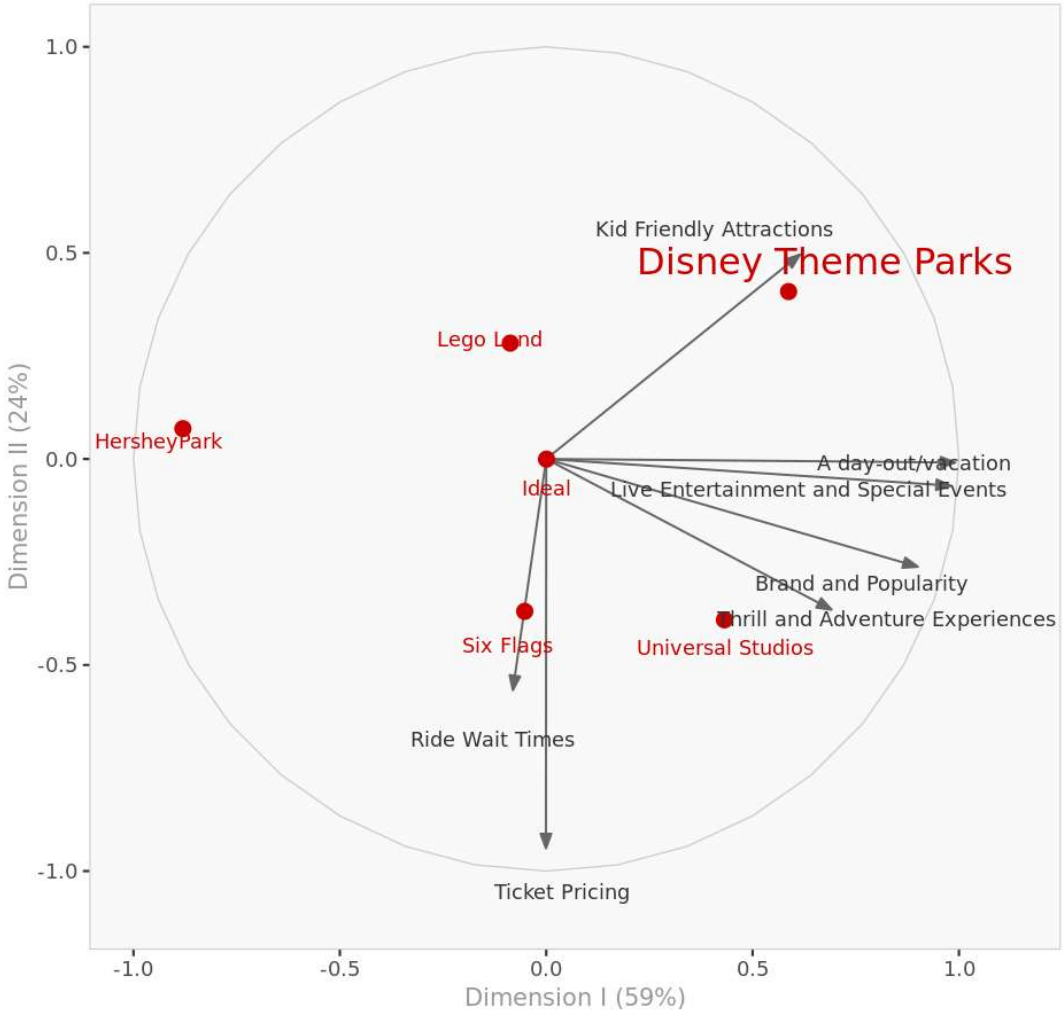
In interpreting the direction of the attributes, remember that:

- Two attributes that go in the same direction are positively correlated, that is, an object rated high on one attribute will usually be rated high on the other.
- Two attributes that are perpendicular to one another are uncorrelated.
- Two attributes that go in opposite directions are negatively correlated, that is, an object rated high on one attribute will often rate low on the other, and vice-versa.

In interpreting the length of the vector representing the attributes:

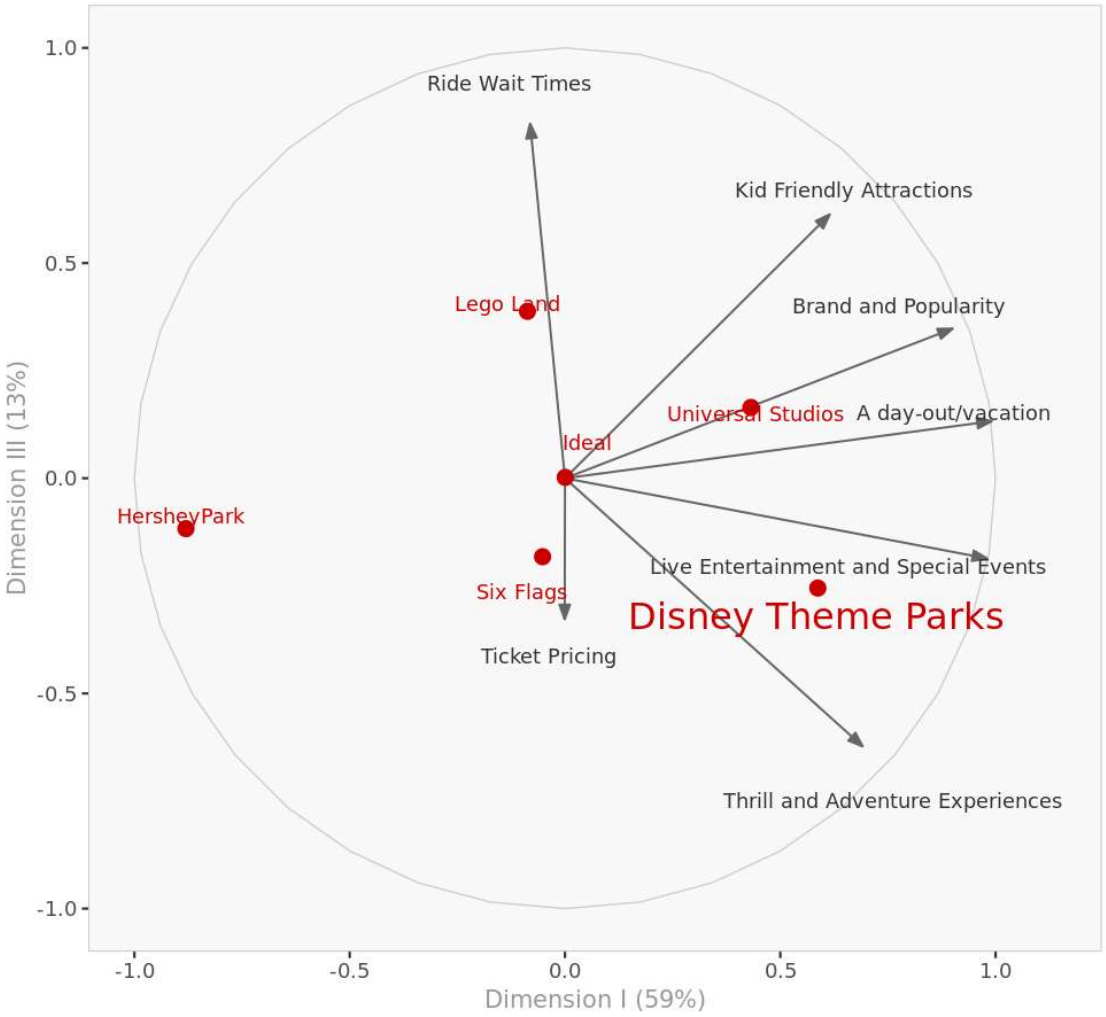
- The longer the attribute vector, the better that attribute is captured by the two dimensions displayed.
- If an attribute appears very close to the origin when looking at dimensions I and II, it could be longer and be better captured by dimension III.

Dimensions I-II



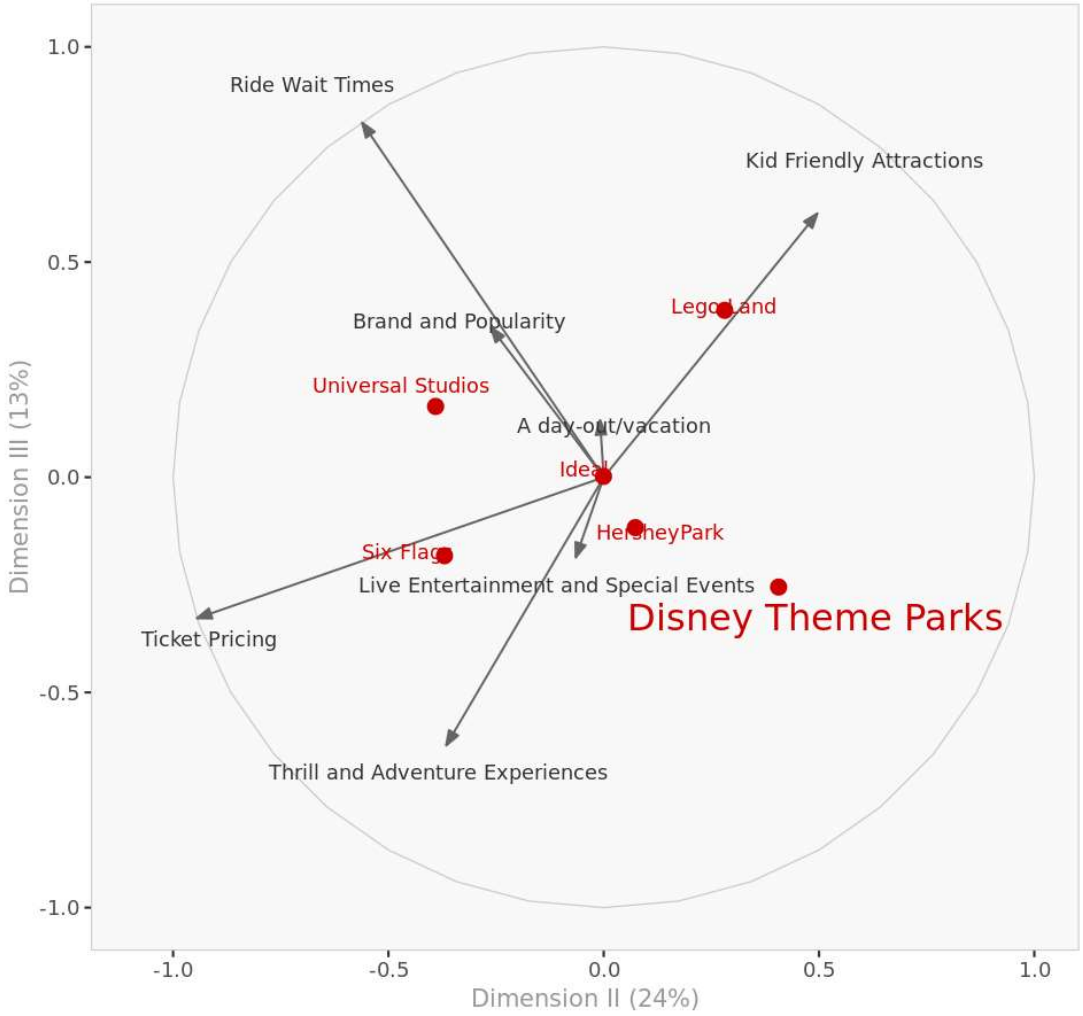
Attributes I-II. Objects and attributes on the first and second dimensions of the perceptual map.

Dimensions I-III



Attributes I-III. Objects and attributes on the first and third dimensions of the perceptual map.

Dimensions II-III



Attributes II-III. Objects and attributes on the second and third dimensions of the perceptual map.

Coordinates

	Dimension I	Dimension II	Dimension III
Brand and Popularity	0.900	-0.262	0.348
Kid Friendly Attractions	0.615	0.496	0.613
Thrill and Adventure Experiences	0.691	-0.366	-0.623
Live Entertainment and Special Events	0.980	-0.065	-0.186
A day-out/vacation	0.991	-0.009	0.133
Ride Wait Times	-0.081	-0.561	0.824
Ticket Pricing	-0.001	-0.945	-0.328

Attributes coordinates. Displays the coordinates of all the attributes in every dimension.

Summary

	Dimension I	Dimension II	Dimension III
1 Most positive	A day-out/vacation		Ride Wait Times
2	Live Entertainment and Special Events		
3	Brand and Popularity		

4 ...	
5 Most negative	Ticket Pricing

Dimension interpretation. Displays the names of the attributes most aligned with each dimension.

	Dimension I	Dimension II	Dimension III
Brand and Popularity	0.1098	-0.0319	0.0424
Kid Friendly Attractions	0.1021	0.0824	0.1018
Thrill and Adventure Experiences	0.1098	-0.0581	-0.0990
Live Entertainment and Special Events	0.1173	-0.0078	-0.0223
A day-out/vacation	0.1248	-0.0011	0.0167
Ride Wait Times	-0.0190	-0.1313	0.1929
Ticket Pricing	-0.0001	-0.1890	-0.0655

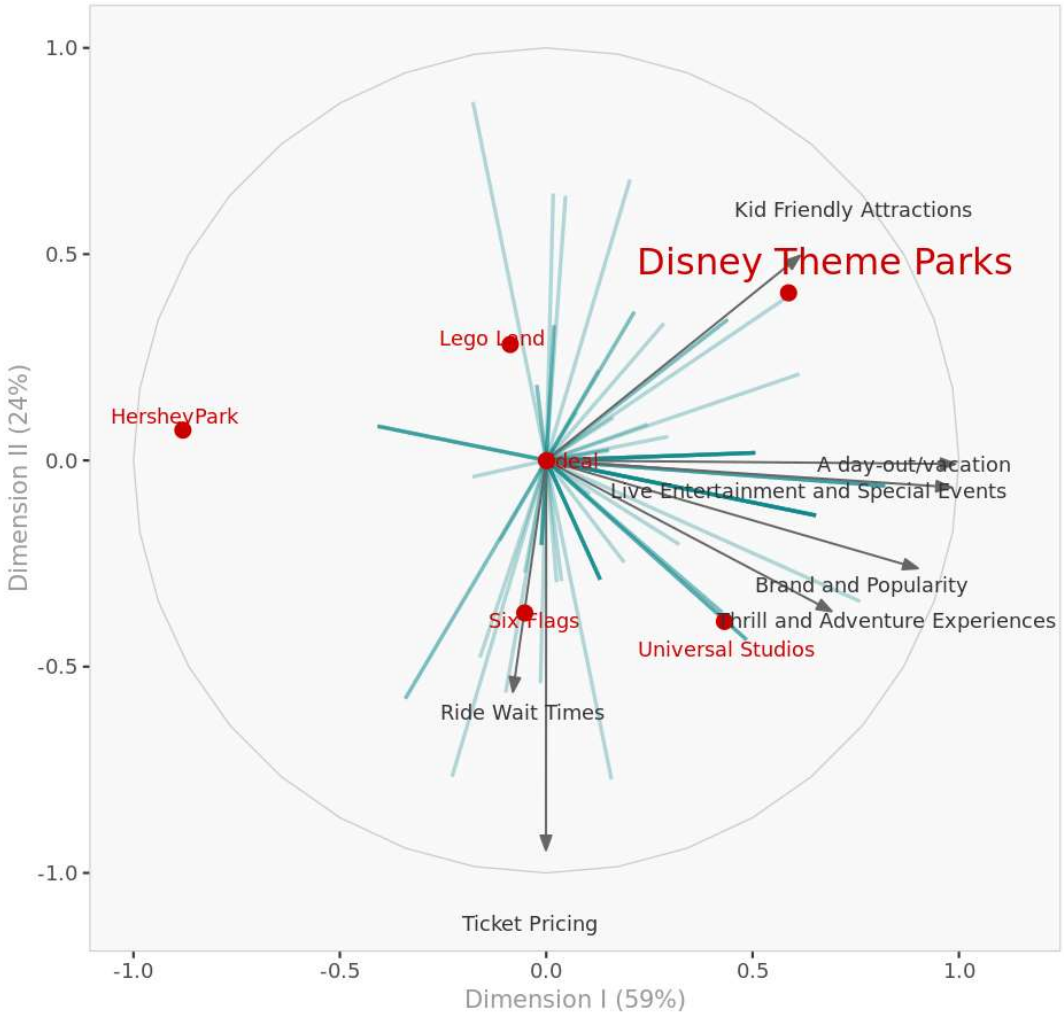
Factor loadings (excerpt). Displays the factor loadings of attributes.

	Mean	Stdev
Brand and Popularity	4.197	0.8976
Kid Friendly Attractions	4.040	0.7460
Thrill and Adventure Experiences	4.250	0.7379
Live Entertainment and Special Events	3.672	1.1271
A day-out/vacation	4.007	0.7570
Ride Wait Times	2.947	0.4135
Ticket Pricing	2.722	0.4910

Mean and standard deviation (excerpt). Displays the means and standard deviations of the attributes.

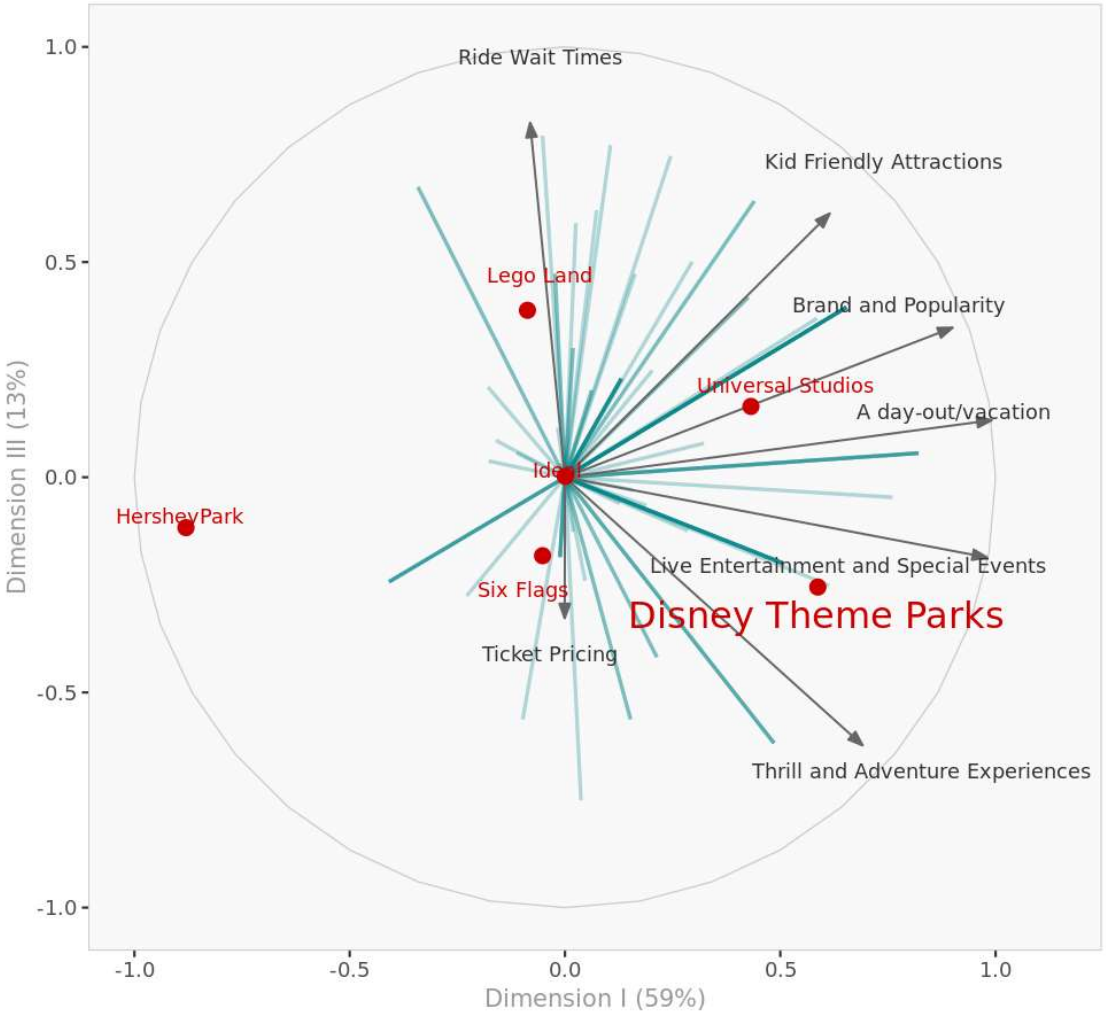
Preferences

Dimensions I-II



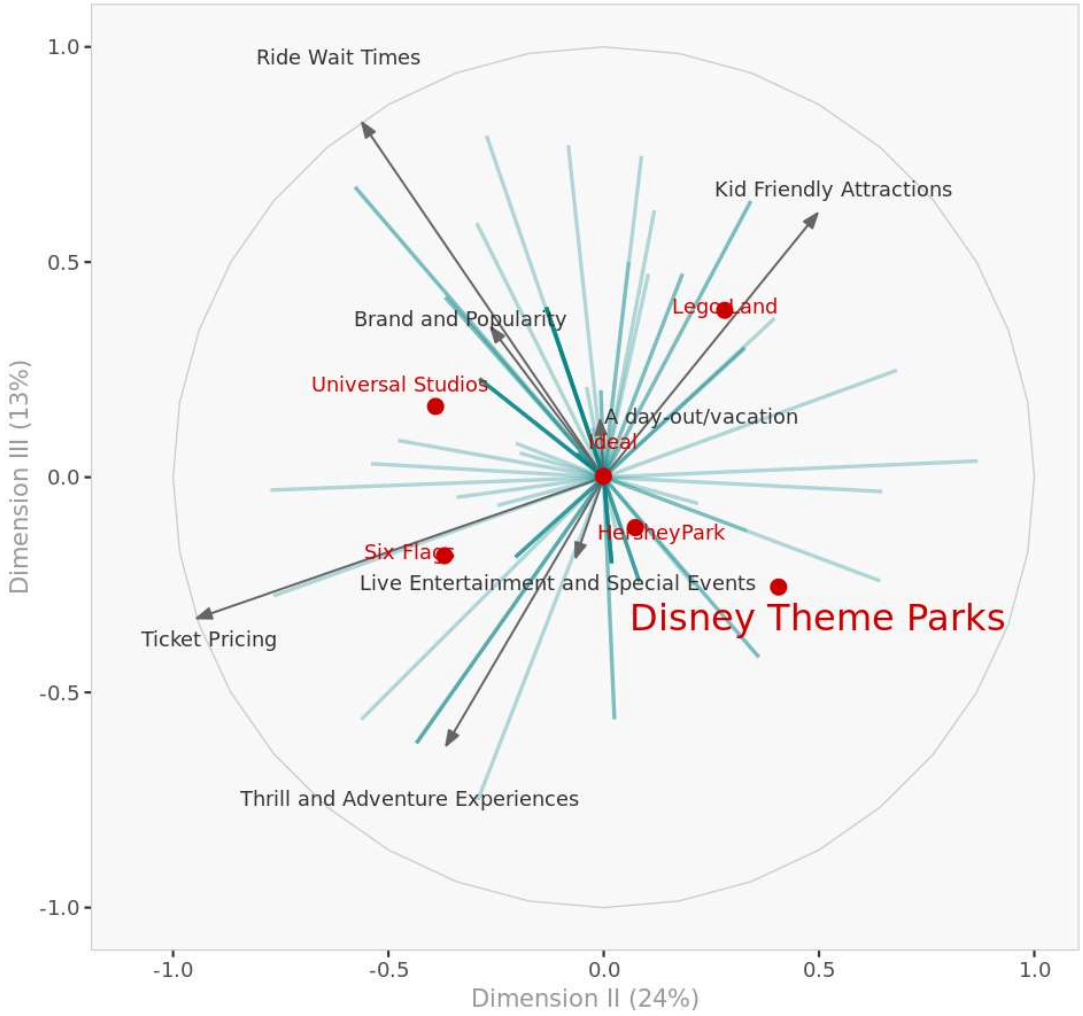
Perceptual Map I-II. Complete perceptual map with objects, attributes and preferences on the first and second dimensions.

Dimensions I-III



Perceptual Map I-III. Complete perceptual map with objects, attributes and preferences on the first and third dimensions.

Dimensions II-III

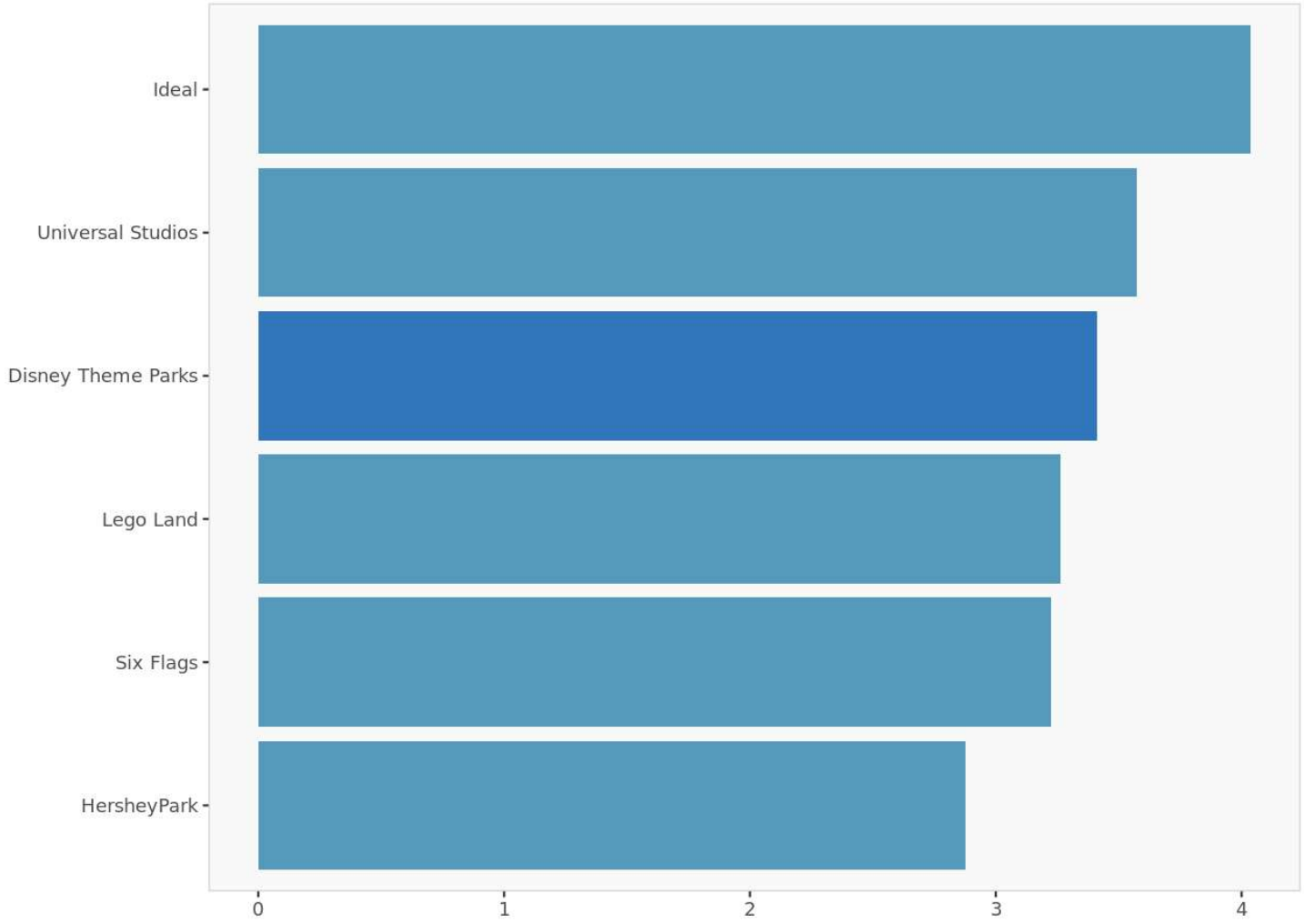


Perceptual Map II-III. Complete perceptual map with objects, attributes and preferences on the second and third dimensions.

Preference data

	Average preference
Ideal	4.04
Universal Studios	3.58
Disney Theme Parks	3.41
Lego Land	3.26
Six Flags	3.23
HersheyPark	2.88

Average brand preference. For each brand, displays its average preference value in decreasing order.



Average preferences histogram. For each brand, displays its average preference value.

	Dimension I	Dimension II	Dimension III
1	-0.179	-0.040	0.210
2	0.131	-0.289	0.229
3	0.019	0.029	-0.127
4	-0.409	0.083	-0.243
5	-0.228	-0.767	-0.275
6	0.613	0.209	-0.252
7	-0.017	-0.027	0.115
8	0.761	-0.342	-0.047
9	0.152	0.025	-0.563
10	-0.342	-0.578	0.675

Customer preferences (excerpt). Displays the coordinates of customer preferences in every dimension.

Market shares

Introduction

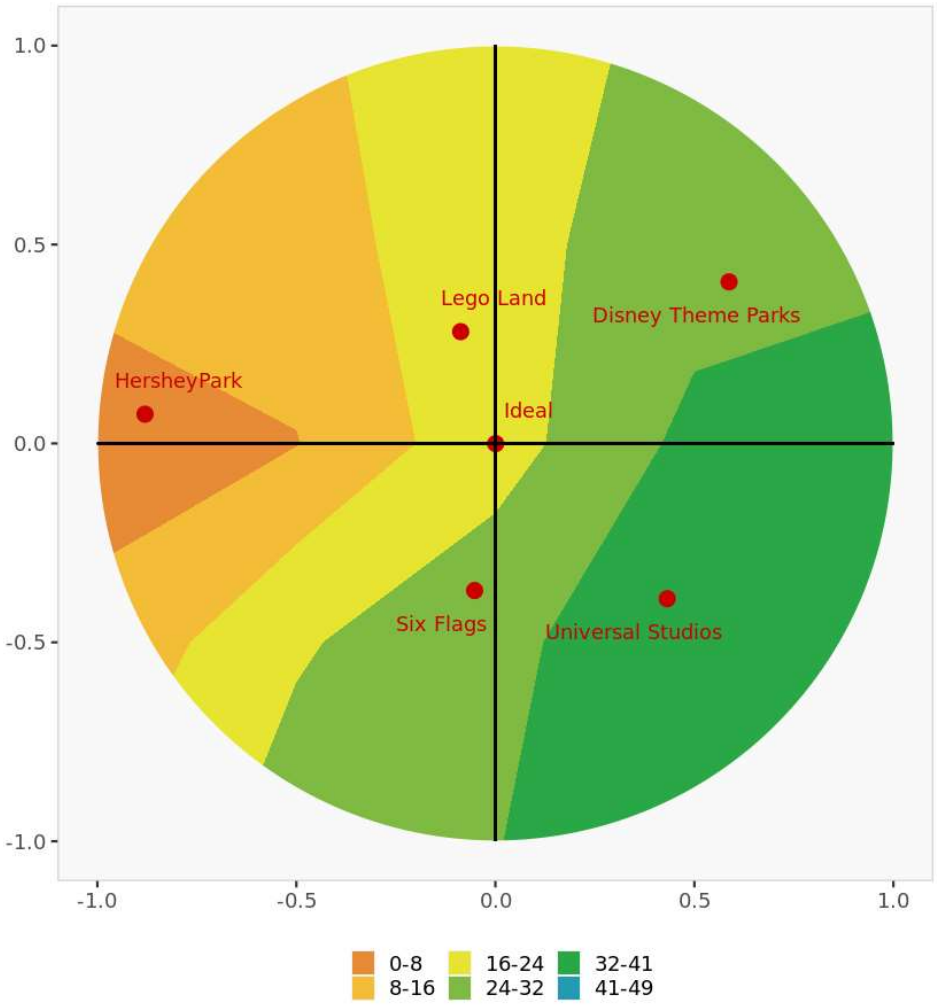
The following charts display simulations of the market shares a new product would achieve, depending on its position on the perceptual maps.

When two dimensions are displayed (e.g., Dimensions I and II), the new product is assumed to be at the center of the third dimension (e.g., Dimension III = 0).

These computations assume that all the other existing objects (i.e., products) will remain in the market, in their respective positions, and compete with the new entrant.

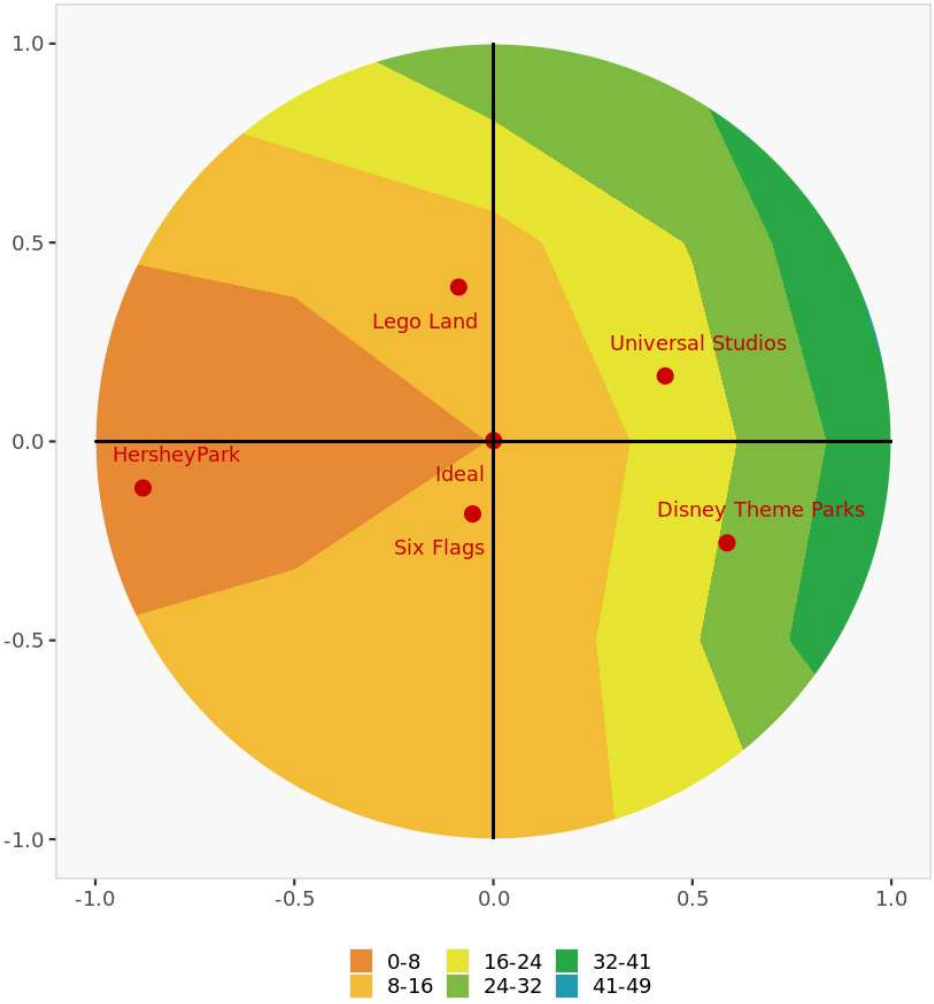
Market shares are estimated based on stated customers' preferences and the first-choice-rule.

Dimension I-II



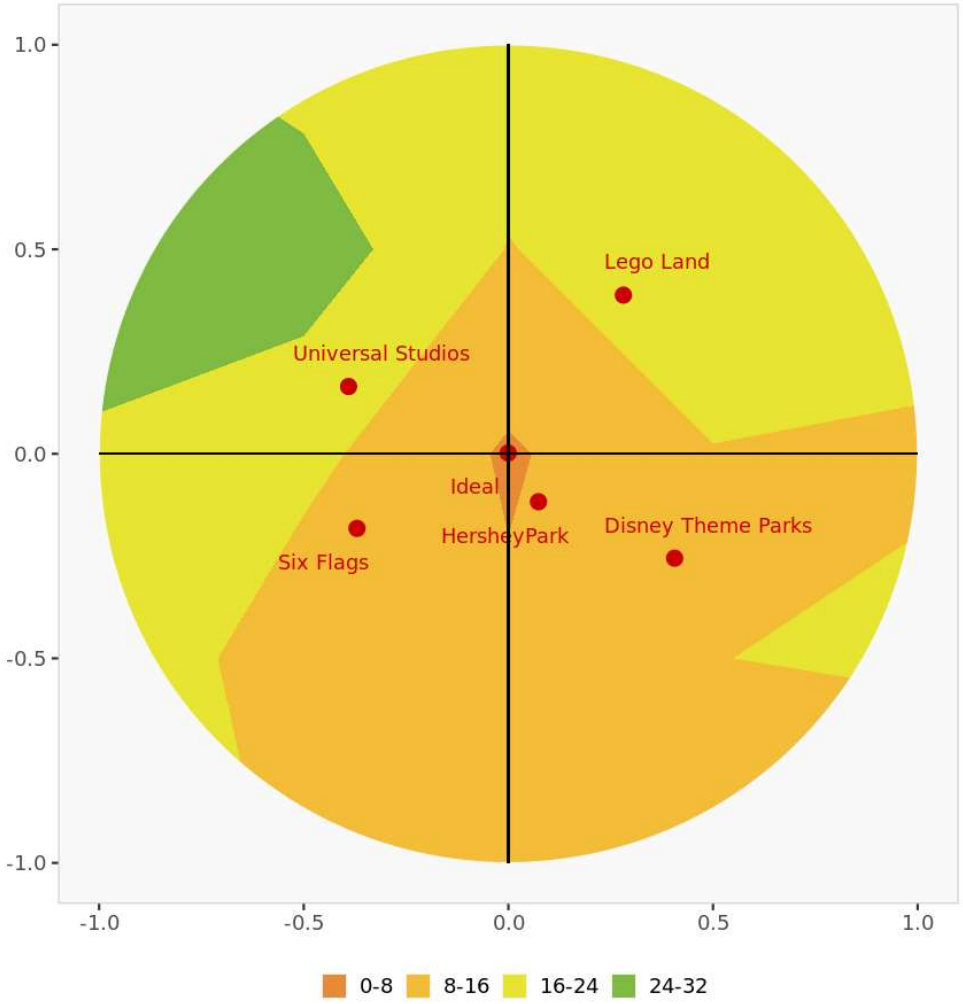
Market shares Dimension I-II. Objects positions along with market shares

Dimension I-III



Market shares Dimension I-III. Objects positions along with market shares

Dimension II-III



Market shares Dimension II-III. Objects positions along with market shares

	Intercept	Dimension I	Dimension II	Dimension III
1	3.17	-0.879	-0.195	1.030
2	2.33	0.328	-0.726	0.575
3	4.67	0.106	0.165	-0.710
4	3.33	-0.668	0.135	-0.397
5	4.67	-0.380	-1.276	-0.459
6	3.67	1.890	0.645	-0.775
7	3.50	-0.105	-0.166	0.717
8	3.33	2.072	-0.931	-0.127
9	4.00	0.814	0.133	-3.007
10	4.83	-0.446	-0.754	0.881

Preference beta values (excerpt).

	Parameter	Value
1	Rule	First-choice
2	alpha	none

Market share parameter table.

	Disney Theme Parks	Six Flags	HersheyPark	Universal Studios	Lego Land	Ideal
1	2	4	3	2	4	4
2	2	2	2	3	2	3
3	5	4	5	5	4	5
4	3	3	4	3	3	4
5	4	5	5	5	4	5
6	5	3	2	4	3	5
7	3	4	3	3	4	4
8	4	4	1	4	3	4
9	5	5	3	3	3	5
10	4	5	5	5	5	5

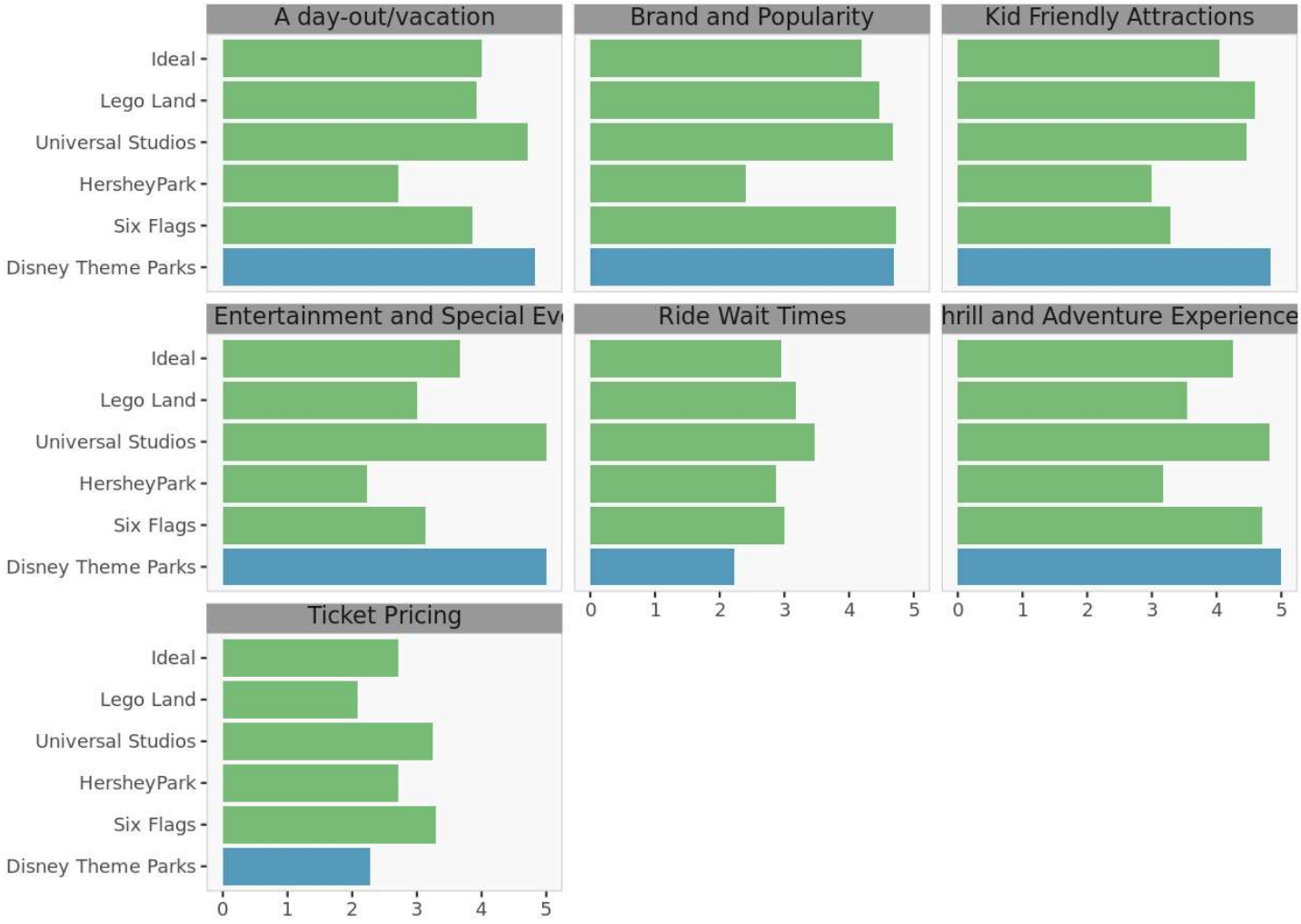
Actual preference data (excerpt).

Perceptual data

Perceptual data

	Disney Theme Parks	Six Flags	HersheyPark	Universal Studios	Lego Land	Ideal
Brand and Popularity	4.7	4.7	2.4	4.7	4.5	4.2
Kid Friendly Attractions	4.8	3.3	3.0	4.5	4.6	4.0
Thrill and Adventure Experiences	5.0	4.7	3.2	4.8	3.6	4.3
Live Entertainment and Special Events	5.0	3.1	2.2	5.0	3.0	3.7
A day-out/vacation	4.8	3.9	2.7	4.7	3.9	4.0
Ride Wait Times	2.2	3.0	2.9	3.5	3.2	3.0
Ticket Pricing	2.3	3.3	2.7	3.3	2.1	2.7

Perceptual data overview. Perception values for each attribute are shown in red if they are significantly (1 standard deviation) less than average perception of all brands. Perception values are shown in green if they are significantly more than average perception of all brands.



Attributes histograms. For each attribute, this chart displays a histogram of brand positions.

enginius
MARKETING ENGINEERING ONLINE

Enginius

GE McKinsey Matrix

Hrithik Vardhan Bontha, University of Tampa

Table of Contents

Predictive options

Options selected

Option	Selection
Rating weights	Yes
Dynamic ratings	No
Bubble sizes	Yes
Market shares	Market shares
Scaling	Absolute scaling
Date and time	2023-11-28 07:10:34 UTC

Options selected.

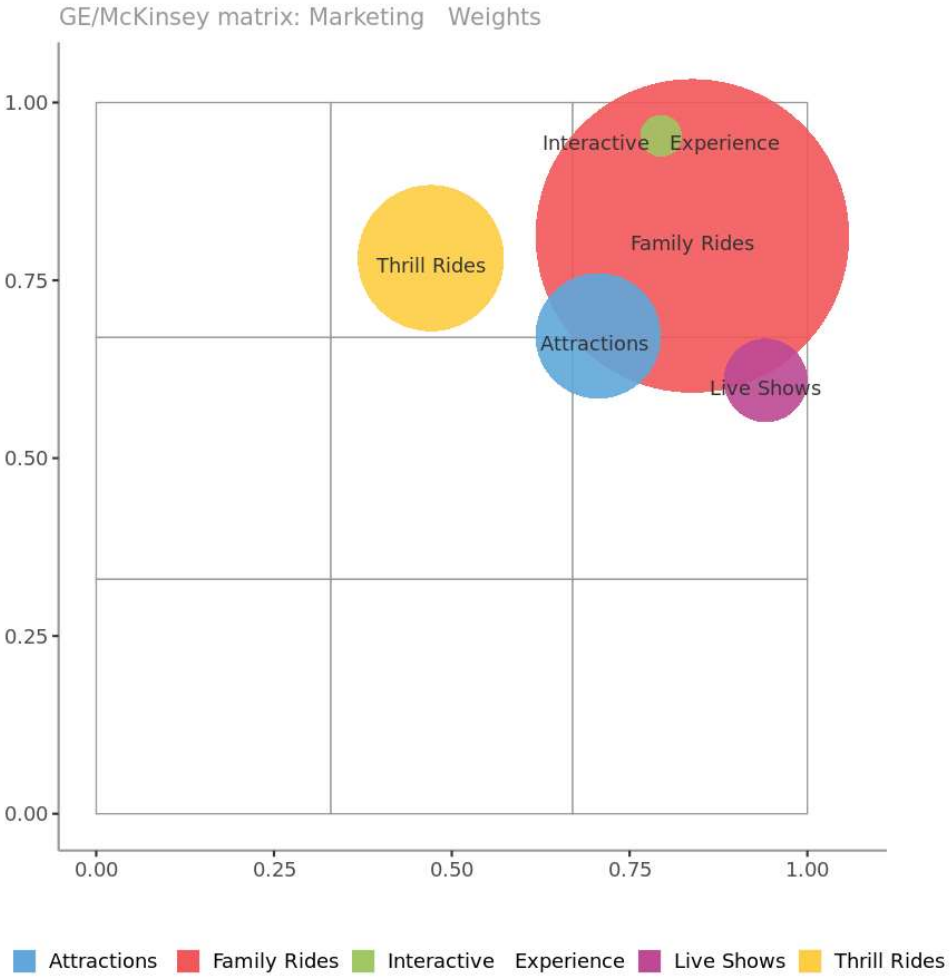
Data description

	Data	Number of Rows	Number of columns	Column names
1	Horizontal ratings data	4	6	C0, Attractions , Family Rides, Thrill Rides, Live Shows, ...
2	Vertical ratings data	4	6	C0, Attractions , Family Rides, Thrill Rides, Live Shows, ...
3	Horizontal weights data	4	3	C0, Marketing Weights, Finance Weights
4	Vertical weights data	4	3	C0, Marketing Weights, Finance Weights
5	Horizontal dynamic ratings data	1	6	\, Attractions , Family Rides, Thrill Rides, Live Shows, ...

Data description.

GE/McKinsey matrix

GE/McKinsey matrix: Marketing Weights

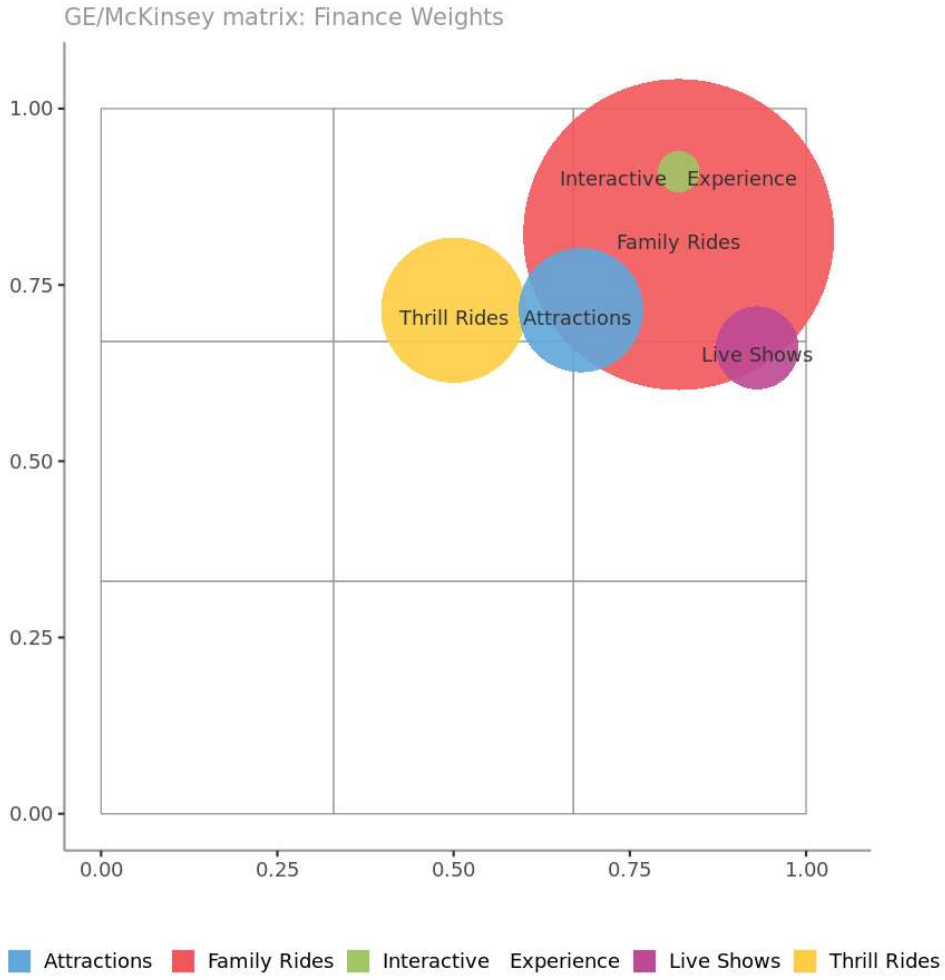


GE/McKinsey matrix for Marketing Weights. If you would like to name the axes, type a label in the upper-left cell of the corresponding horizontal or vertical ratings.

	x-coordinate	y-coordinate	Size
Attractions	0.71	0.67	0.18
Family Rides	0.84	0.81	0.44
Thrill Rides	0.47	0.78	0.21
Live Shows	0.94	0.61	0.12
Interactive Experience	0.79	0.95	0.06

Bubble coordinates in the GE/McKinsey matrix for Marketing Weights.

GE/McKinsey matrix: Finance Weights



GE/McKinsey matrix for Finance Weights. If you would like to name the axes, type a label in the upper-left cell of the corresponding horizontal or vertical ratings.

	x-coordinate	y-coordinate	Size
Attractions	0.68	0.71	0.18
Family Rides	0.82	0.82	0.44
Thrill Rides	0.50	0.71	0.21
Live Shows	0.93	0.66	0.12
Interactive Experience	0.82	0.91	0.06

Bubble coordinates in the GE/McKinsey matrix for Finance Weights.

enginius
MARKETING ENGINEERING ONLINE

Enginius

Price Optimization

Julia Tarhini, University of Tampa

Model selection

Introduction

Different models have been tested to model the data you have provided, and the one model that led to the best fit was retained.

The tested models differ in the way the influence of price is encoded. The price influence can be:

- Linear (price)
- Logarithmic (log(price))
- Square root (sqrt(price))

Different combinations of the above price encodings can be combined, depending on the nature of the data.

Model selection

	Ceiling	Intercept	Price	log(Price)	sqrt(Price)	BIC	Selected
Model 1	0.50	0.00	-0.01			180.36	
Model 2	1.00	0.37	-0.22		2.81	167.29	YES
Model 3	0.50	0.00	-0.01	0.00		180.36	
Model 4	1.00	0.17	-0.13	0.74	1.29	167.70	

Model selection.

The survey data of observed purchase behaviour is best described by a logit model with the following number of parameters: 4

The estimated model has a ceiling parameter of 1.0000 . This means that the maximum attainable market share is 100.00 %

This logit model includes a ceiling, intercept and two slope parameters. Likelihood is a function of price and the square root of price.

Model fit

Model parameters

	Ceiling	Intercept	Price	sqrt(Price)
Values	1.00	0.37	-0.22	2.81
Standards errors	0.23	8.71	0.05	1.21
P-value	0.00	0.97	0.00	0.02

Model parameters.

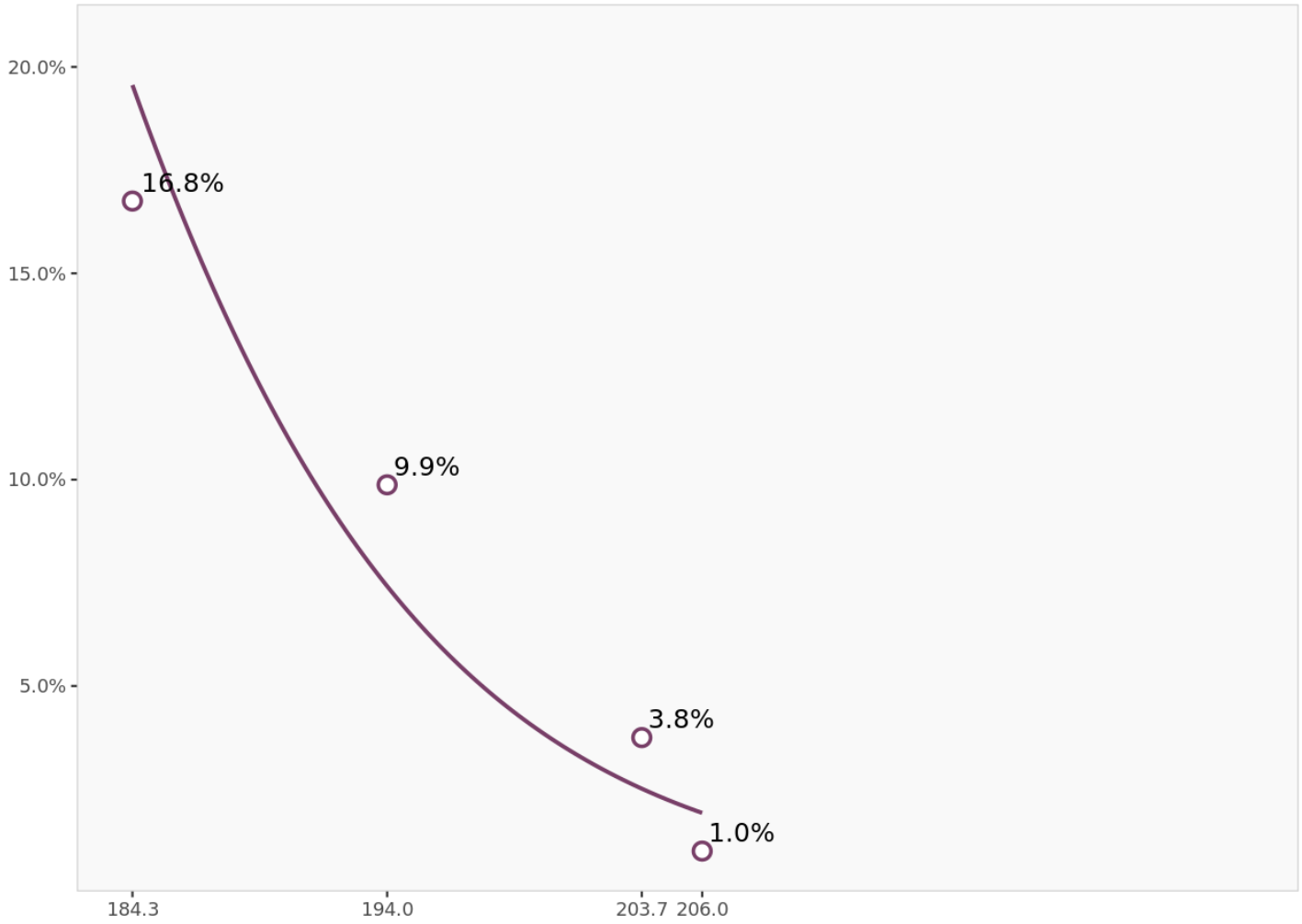
The p-values of the parameters are highlighted in green if significant at 5% level.

Model fit

	Measures of model fit
Root Mean Squared Error	0.0202
R-squared	1.3667
McFadden R-squared	0.0887
Bayesian Information Criterion	167.2882

Model Fit.

Predicted purchase likelihood



Predicted likelihood. The dots represent the purchase likelihood derived from the survey for different price levels. The line represents the model predictions.

	Price level 1	Price level 2	Price level 3	Price level 4
Price levels	184.30	194.00	203.70	206.00
Purchase likelihood (from survey)	16.8%	9.9%	3.8%	1.0%
Predicted likelihood (from model)	19.6%	7.4%	2.5%	1.9%

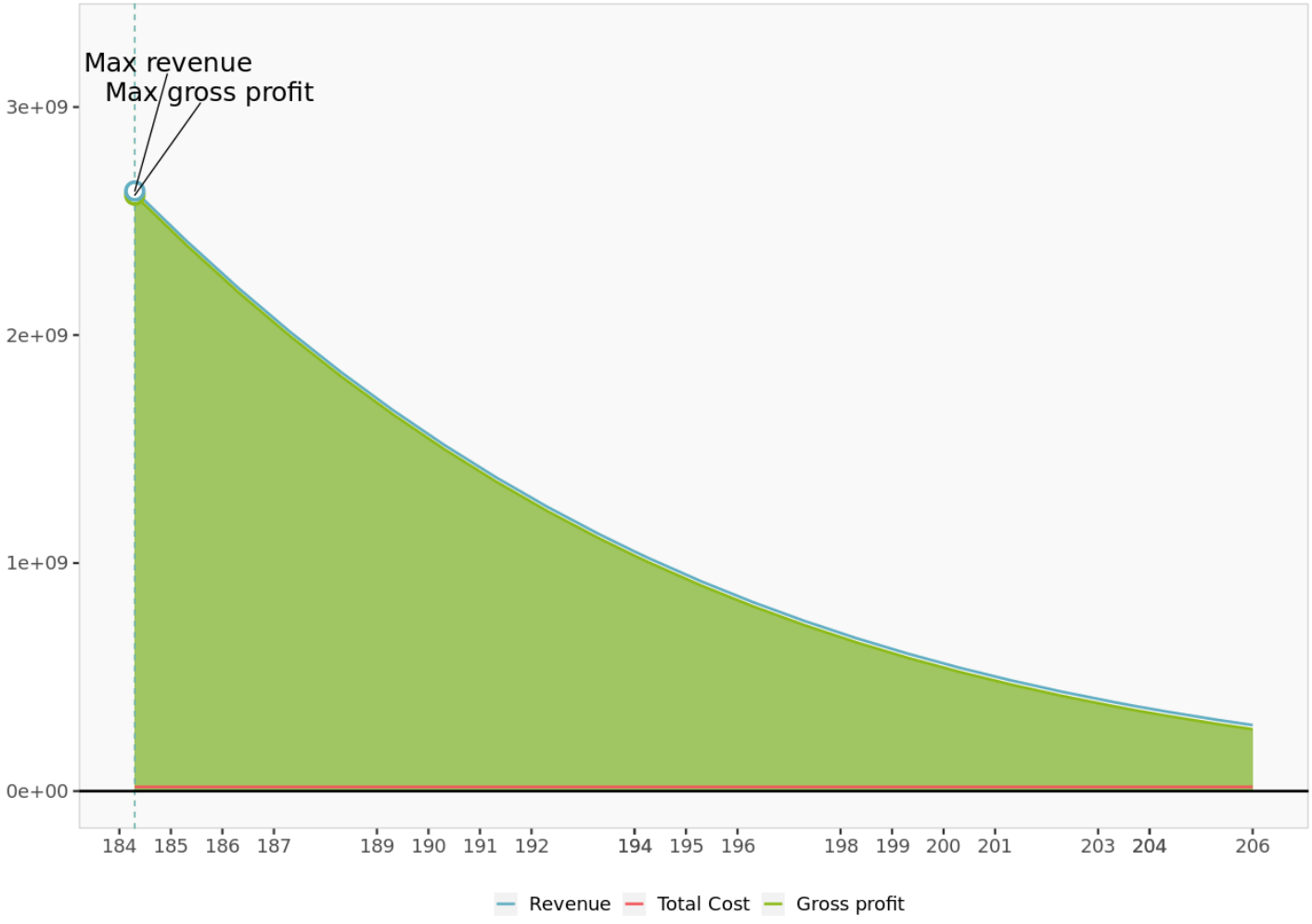
Model predictions.

Price optimization

Optimization results

	Prices	Predicted likelihood	Units sold	Revenue	Cost	Gross profit
Level 1	194.00	7.4%	5 415 911	1 050 686 812.74	18 250 000.00	1 032 436 812.74
Level 2	203.70	2.5%	1 833 788	373 542 537.79	18 250 000.00	355 292 537.79
Level 3	206.00	1.9%	1 404 901	289 409 572.16	18 250 000.00	271 159 572.16
Max revenue	184.30	19.6%	14 280 250	2 631 850 133.74	18 250 000.00	2 613 600 133.74

Optimization results.



Price optimization.

Price point examples

	Prices	Predicted likelihood	Units sold	Revenue	Cost	Gross profit
Level 1	185.30	17.8%	13 023 913	2 413 331 151.90	18 250 000.00	2 395 081 151.90
Level 2	186.30	16.2%	11 853 025	2 208 218 550.33	18 250 000.00	2 189 968 550.33
Level 3	187.30	14.7%	10 765 968	2 016 465 776.93	18 250 000.00	1 998 215 776.93
Level 4	188.30	13.4%	9 760 372	1 837 878 119.73	18 250 000.00	1 819 628 119.73
Level 5	189.30	12.1%	8 833 259	1 672 136 000.95	18 250 000.00	1 653 886 000.95
Level 6	190.30	10.9%	7 981 177	1 518 817 964.64	18 250 000.00	1 500 567 964.64
Level 7	191.30	9.9%	7 200 327	1 377 422 578.60	18 250 000.00	1 359 172 578.60
Level 8	192.30	8.9%	6 486 681	1 247 388 684.11	18 250 000.00	1 229 138 684.11
Level 9	193.30	8.0%	5 836 077	1 128 113 623.27	18 250 000.00	1 109 863 623.27
Level 10	194.00	7.4%	5 415 911	1 050 686 812.74	18 250 000.00	1 032 436 812.74
Level 11	194.30	7.2%	5 244 309	1 018 969 243.97	18 250 000.00	1 000 719 243.97
Level 12	195.30	6.4%	4 707 197	919 315 621.36	18 250 000.00	901 065 621.36
Level 13	196.30	5.8%	4 220 645	828 512 542.40	18 250 000.00	810 262 542.40
Level 14	197.30	5.2%	3 780 684	745 928 877.75	18 250 000.00	727 678 877.75
Level 15	198.30	4.6%	3 383 510	670 950 016.65	18 250 000.00	652 700 016.65
Level 16	199.30	4.1%	3 025 507	602 983 570.73	18 250 000.00	584 733 570.73
Level 17	200.30	3.7%	2 703 263	541 463 564.46	18 250 000.00	523 213 564.46
Level 18	201.30	3.3%	2 413 578	485 853 330.31	18 250 000.00	467 603 330.31
Level 19	202.30	2.9%	2 153 472	435 647 316.32	18 250 000.00	417 397 316.32
Level 20	203.30	2.6%	1 920 177	390 371 998.82	18 250 000.00	372 121 998.82
Level 21	203.70	2.5%	1 833 788	373 542 537.79	18 250 000.00	355 292 537.79
Level 22	204.30	2.3%	1 711 141	349 586 073.47	18 250 000.00	331 336 073.47
Level 23	205.30	2.1%	1 524 014	312 880 077.54	18 250 000.00	294 630 077.54
Level 24	206.00	1.9%	1 404 901	289 409 572.16	18 250 000.00	271 159 572.16

Example results.

enginius
MARKETING ENGINEERING ONLINE

Enginius

Price Optimization

Julia Tarhini, University of Tampa

Model selection

Introduction

Different models have been tested to model the data you have provided, and the one model that led to the best fit was retained.

The tested models differ in the way the influence of price is encoded. The price influence can be:

- Linear (price)
- Logarithmic (log(price))
- Square root (sqrt(price))

Different combinations of the above price encodings can be combined, depending on the nature of the data.

Model selection

	Ceiling	Intercept	Price	log(Price)	sqrt(Price)	BIC	Selected
Model 1	1.00	0.16	-0.02			205.13	
Model 2	1.00	0.41	-0.23		2.73	189.13	YES
Model 3	1.00	0.16	-0.04	0.66		200.37	
Model 4	1.00	0.34	-0.24	1.39	2.23	189.46	

Model selection.

The survey data of observed purchase behaviour is best described by a logit model with the following number of parameters: 4

The estimated model has a ceiling parameter of 0.9999 . This means that the maximum attainable market share is 99.99 %

This logit model includes a ceiling, intercept and two slope parameters. Likelihood is a function of price and the square root of price.

Model fit

Model parameters

	Ceiling	Intercept	Price	sqrt.Price.
Values	1.00	0.41	-0.23	2.73

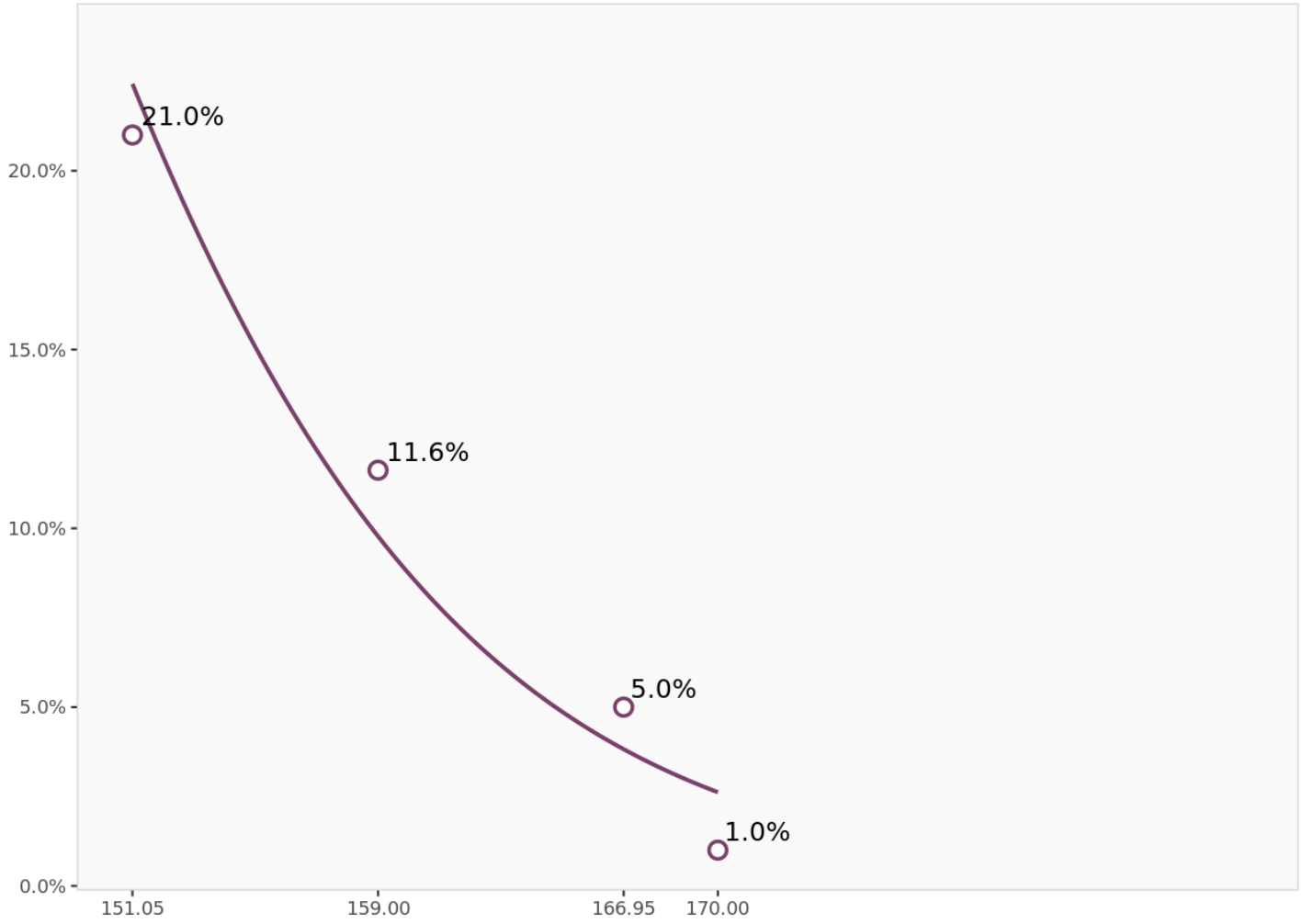
Model Parameters.

Model fit

	Measures of model fit
Root Mean Squared Error	0.0154
R-squared	1.0766
McFadden R-squared	0.1033
Bayesian Information Criterion	189.1264

Model Fit.

Predicted purchase likelihood



Predicted likelihood. The dots represent the purchase likelihood derived from the survey for different price levels. The line represents the model predictions.

	Price level 1	Price level 2	Price level 3	Price level 4
Price levels	151.05	159.00	166.95	170.00
Purchase likelihood (from survey)	21.0%	11.6%	5.0%	1.0%
Predicted likelihood (from model)	22.4%	9.8%	3.8%	2.6%

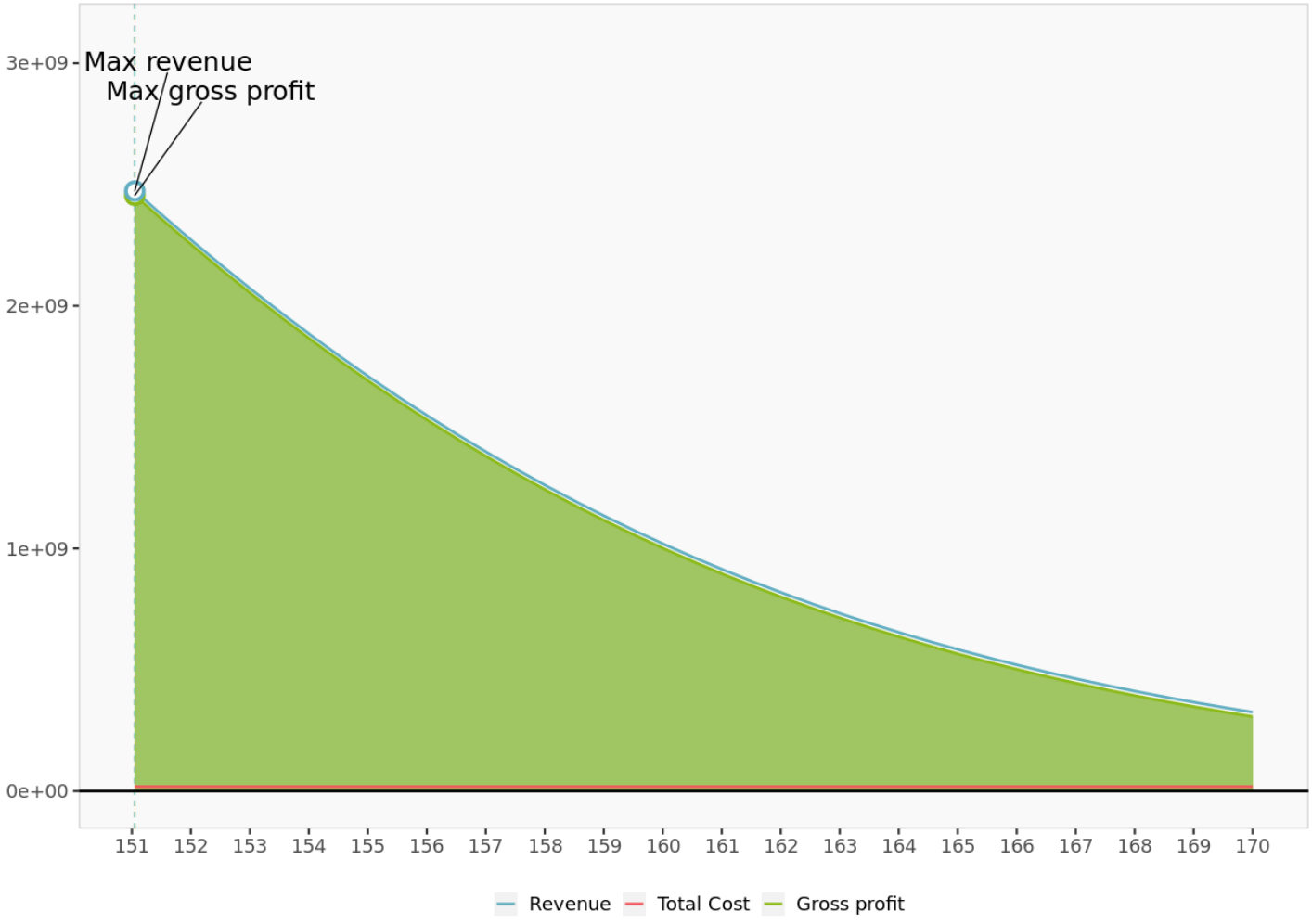
Model predictions.

Price optimization

Optimization results

	Prices	Predicted likelihood	Units sold	Revenue	Cost	Gross profit
Level 1	159.00	9.8%	7 137 869	1 134 921 184.60	18 250 000.00	1 116 671 184.60
Level 2	166.95	3.8%	2 790 959	465 950 560.79	18 250 000.00	447 700 560.79
Level 3	170.00	2.6%	1 912 949	325 201 285.01	18 250 000.00	306 951 285.01
Max revenue	151.05	22.4%	16 374 279	2 473 334 903.59	18 250 000.00	2 455 084 903.59

Optimization results.



Price optimization.

Price point examples

	Prices	Predicted likelihood	Units sold	Revenue	Cost	Gross profit
Level 1	151.55	21.4%	15 611 846	2 365 975 213.20	18 250 000.00	2 347 725 213.20
Level 2	152.05	20.4%	14 874 503	2 261 668 138.18	18 250 000.00	2 243 418 138.18
Level 3	152.55	19.4%	14 162 350	2 160 466 461.94	18 250 000.00	2 142 216 461.94
Level 4	153.05	18.5%	13 475 392	2 062 408 719.88	18 250 000.00	2 044 158 719.88
Level 5	153.55	17.6%	12 813 545	1 967 519 885.48	18 250 000.00	1 949 269 885.48
Level 6	154.05	16.7%	12 176 645	1 875 812 124.56	18 250 000.00	1 857 562 124.56
Level 7	154.55	15.8%	11 564 449	1 787 285 602.62	18 250 000.00	1 769 035 602.62
Level 8	155.05	15.0%	10 976 648	1 701 929 330.50	18 250 000.00	1 683 679 330.50
Level 9	155.55	14.3%	10 412 871	1 619 722 034.66	18 250 000.00	1 601 472 034.66
Level 10	156.05	13.5%	9 872 688	1 540 633 039.48	18 250 000.00	1 522 383 039.48
Level 11	156.55	12.8%	9 355 625	1 464 623 150.24	18 250 000.00	1 446 373 150.24
Level 12	157.05	12.1%	8 861 162	1 391 645 526.63	18 250 000.00	1 373 395 526.63
Level 13	157.55	11.5%	8 388 743	1 321 646 538.03	18 250 000.00	1 303 396 538.03
Level 14	158.05	10.9%	7 937 783	1 254 566 593.01	18 250 000.00	1 236 316 593.01
Level 15	158.55	10.3%	7 507 669	1 190 340 937.00	18 250 000.00	1 172 090 937.00
Level 16	159.00	9.8%	7 137 869	1 134 921 184.60	18 250 000.00	1 116 671 184.60
Level 17	159.05	9.7%	7 097 771	1 128 900 412.92	18 250 000.00	1 110 650 412.92
Level 18	159.55	9.2%	6 707 441	1 070 172 181.08	18 250 000.00	1 051 922 181.08
Level 19	160.05	8.7%	6 336 022	1 014 080 395.43	18 250 000.00	995 830 395.43
Level 20	160.55	8.2%	5 982 852	960 546 834.34	18 250 000.00	942 296 834.34
Level 21	161.05	7.7%	5 647 262	909 491 484.80	18 250 000.00	891 241 484.80
Level 22	161.55	7.3%	5 328 586	860 833 079.86	18 250 000.00	842 583 079.86
Level 23	162.05	6.9%	5 026 162	814 489 589.55	18 250 000.00	796 239 589.55
Level 24	162.55	6.5%	4 739 334	770 378 666.16	18 250 000.00	752 128 666.16
Level 25	163.05	6.1%	4 467 452	728 418 045.30	18 250 000.00	710 168 045.30
Level 26	163.55	5.8%	4 209 880	688 525 904.27	18 250 000.00	670 275 904.27
Level 27	164.05	5.4%	3 965 993	650 621 179.76	18 250 000.00	632 371 179.76
Level 28	164.55	5.1%	3 735 180	614 623 847.05	18 250 000.00	596 373 847.05
Level 29	165.05	4.8%	3 516 844	580 455 163.00	18 250 000.00	562 205 163.00
Level 30	165.55	4.5%	3 310 407	548 037 875.12	18 250 000.00	529 787 875.12
Level 31	166.05	4.3%	3 115 305	517 296 399.35	18 250 000.00	499 046 399.35

Level 32	166.55	4.0%	2 930 994	488 156 968.74	18 250 000.00	469 906 968.74
Level 33	166.95	3.8%	2 790 959	465 950 560.79	18 250 000.00	447 700 560.79
Level 34	167.05	3.8%	2 756 946	460 547 755.60	18 250 000.00	442 297 755.60
Level 35	167.55	3.6%	2 592 653	434 398 969.38	18 250 000.00	416 148 969.38
Level 36	168.05	3.3%	2 437 625	409 642 932.56	18 250 000.00	391 392 932.56
Level 37	168.55	3.1%	2 291 392	386 214 136.70	18 250 000.00	367 964 136.70
Level 38	169.05	3.0%	2 153 501	364 049 280.67	18 250 000.00	345 799 280.67
Level 39	169.55	2.8%	2 023 517	343 087 293.13	18 250 000.00	324 837 293.13
Level 40	170.00	2.6%	1 912 949	325 201 285.01	18 250 000.00	306 951 285.01

Example results.

enginius
MARKETING ENGINEERING ONLINE

Enginius

Price Optimization

Julia Tarhini, University of Tampa

Model selection

Introduction

Different models have been tested to model the data you have provided, and the one model that led to the best fit was retained.

The tested models differ in the way the influence of price is encoded. The price influence can be:

- Linear (price)
- Logarithmic (log(price))
- Square root (sqrt(price))

Different combinations of the above price encodings can be combined, depending on the nature of the data.

Model selection

	Ceiling	Intercept	Price	log(Price)	sqrt(Price)	BIC	Selected
Model 1	0.97	9.81	-0.10			313.34	
Model 2	1.00	0.34	-0.18		1.77	313.28	
Model 3	1.00	0.69	-0.13	2.56		313.36	
Model 4	0.27	1.85	-1.25	6.94	10.16	308.97	YES

Model selection.

The survey data of observed purchase behaviour is best described by a logit model with the following number of parameters: 5

The estimated model has a ceiling parameter of 0.2744 . This means that the maximum attainable market share is 27.44 %

This logit model includes a ceiling, intercept and three slope parameters. Likelihood is a function of price, the natural logarithm and the square root of price.

Model fit

Model parameters

	Ceiling	Intercept	Price	sqrt.Price.	log.Price.
Values	0.27	1.85	-1.25	6.94	10.16

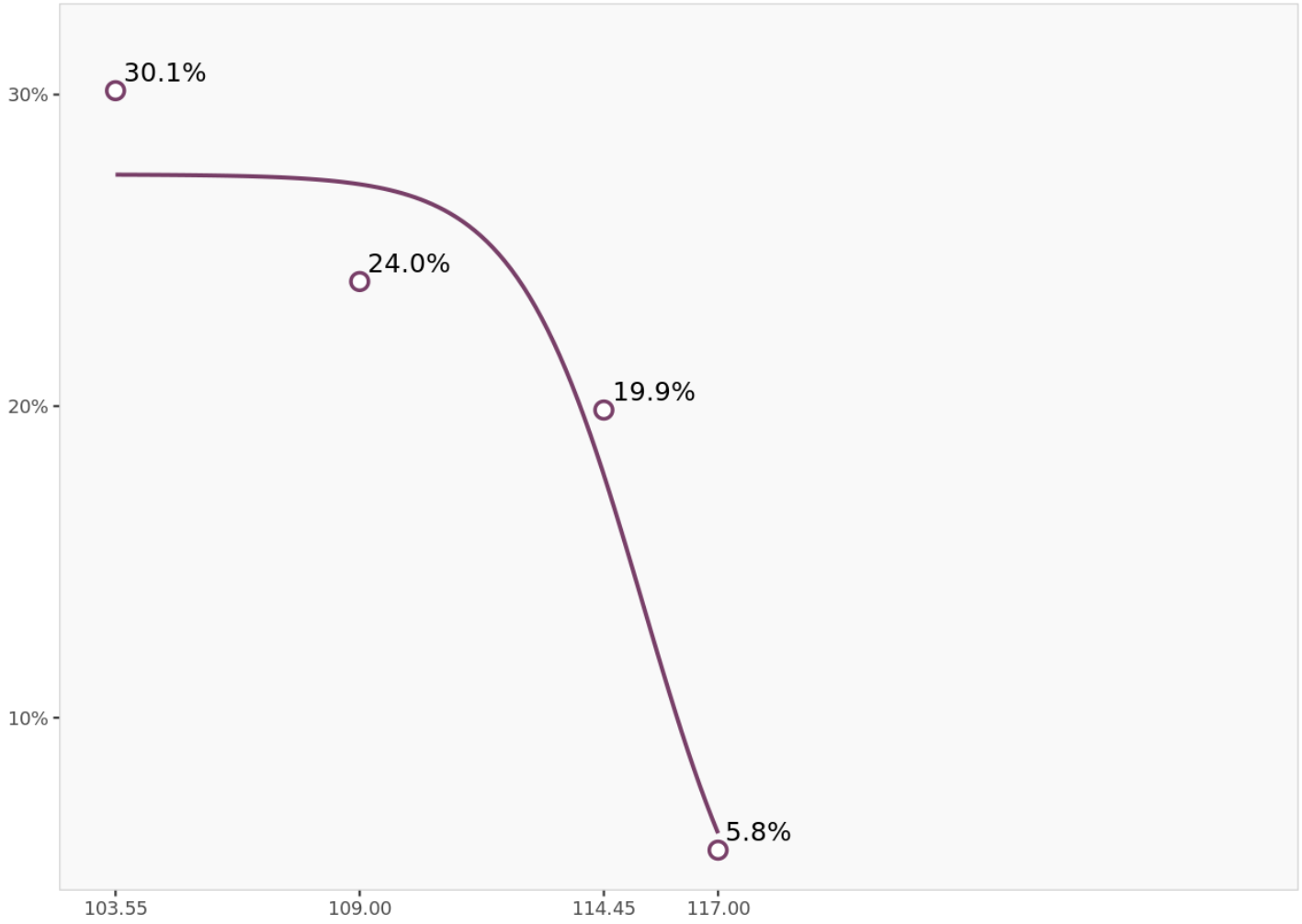
Model Parameters.

Model fit

	Measures of model fit
Root Mean Squared Error	0.0233
R-squared	0.9284
McFadden R-squared	0.0553
Bayesian Information Criterion	308.9650

Model Fit.

Predicted purchase likelihood



Predicted likelihood. The dots represent the purchase likelihood derived from the survey for different price levels. The line represents the model predictions.

	Price level 1	Price level 2	Price level 3	Price level 4
Price levels	103.55	109.00	114.45	117.00
Purchase likelihood (from survey)	30.1%	24.0%	19.9%	5.8%
Predicted likelihood (from model)	27.4%	27.1%	17.8%	6.3%

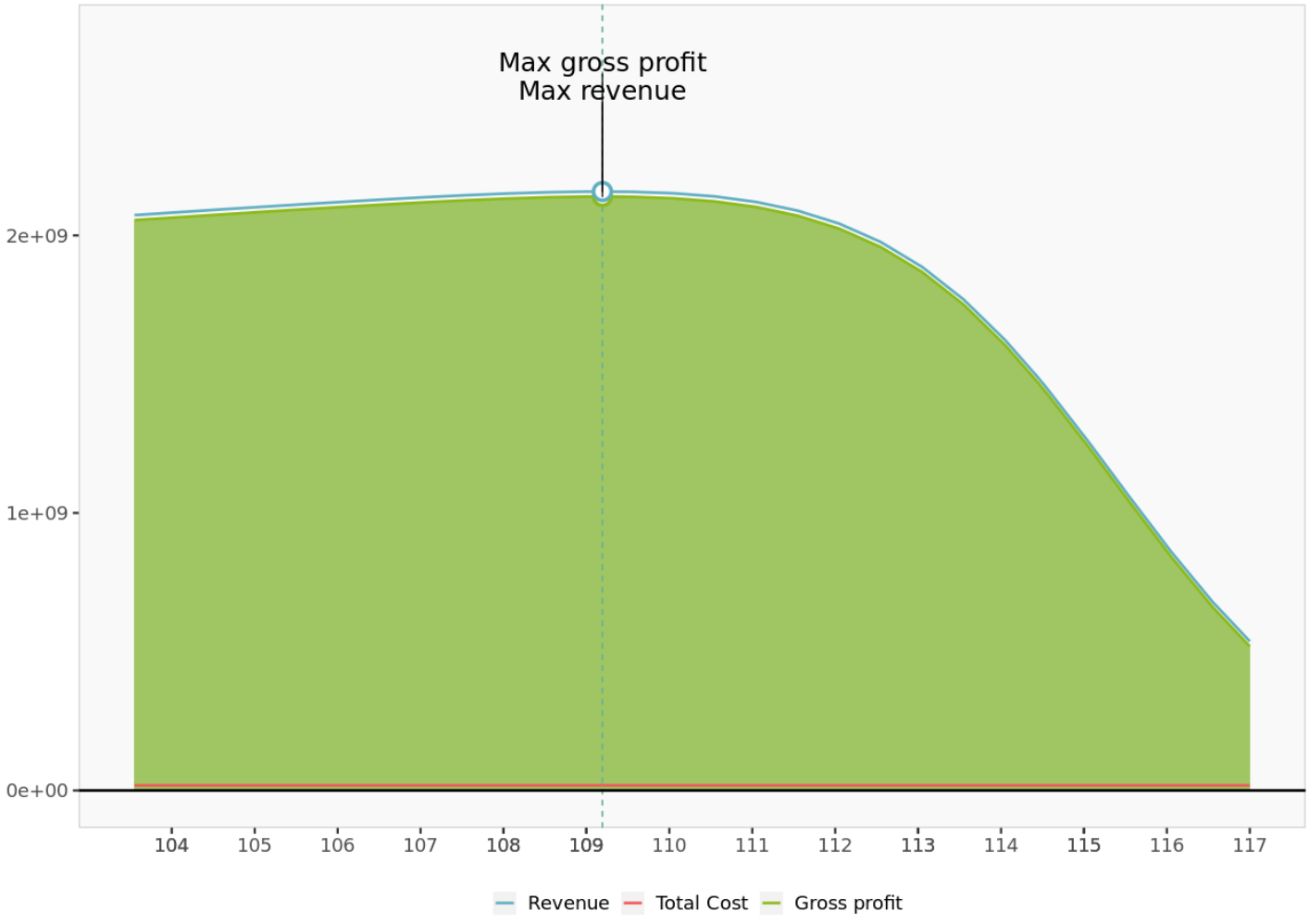
Model predictions.

Price optimization

Optimization results

	Prices	Predicted likelihood	Units sold	Revenue	Cost	Gross profit
Level 1	103.55	27.4%	20 022 987	2 073 380 298.11	18 250 000.00	2 055 130 298.11
Level 2	109.00	27.1%	19 798 402	2 158 025 765.23	18 250 000.00	2 139 775 765.23
Level 3	114.45	17.8%	12 989 220	1 486 616 195.05	18 250 000.00	1 468 366 195.05
Level 4	117.00	6.3%	4 592 631	537 337 869.01	18 250 000.00	519 087 869.01
Max gross profit	109.19	27.1%	19 765 677	2 158 273 262.37	18 250 000.00	2 140 023 262.37
Max revenue	109.19	27.1%	19 765 677	2 158 273 262.37	18 250 000.00	2 140 023 262.37

Optimization results.



Price optimization.

Price point examples

	Prices	Predicted likelihood	Units sold	Revenue	Cost	Gross profit
Level 1	103.55	27.4%	20 022 987	2 073 380 298.11	18 250 000.00	2 055 130 298.11
Level 2	104.05	27.4%	20 020 783	2 083 162 480.24	18 250 000.00	2 064 912 480.24
Level 3	104.55	27.4%	20 017 676	2 092 848 005.90	18 250 000.00	2 074 598 005.90
Level 4	105.05	27.4%	20 013 292	2 102 396 328.54	18 250 000.00	2 084 146 328.54
Level 5	105.55	27.4%	20 007 104	2 111 749 808.68	18 250 000.00	2 093 499 808.68
Level 6	106.05	27.4%	19 998 364	2 120 826 504.14	18 250 000.00	2 102 576 504.14
Level 7	106.55	27.4%	19 986 015	2 129 509 947.96	18 250 000.00	2 111 259 947.96
Level 8	107.05	27.4%	19 968 563	2 137 634 698.67	18 250 000.00	2 119 384 698.67
Level 9	107.55	27.3%	19 943 896	2 144 966 007.44	18 250 000.00	2 126 716 007.44
Level 10	108.05	27.3%	19 909 037	2 151 171 402.09	18 250 000.00	2 132 921 402.09
Level 11	108.55	27.2%	19 859 801	2 155 781 381.21	18 250 000.00	2 137 531 381.21
Level 12	109.00	27.1%	19 798 402	2 158 025 765.23	18 250 000.00	2 139 775 765.23
Level 13	109.05	27.1%	19 790 334	2 158 135 879.86	18 250 000.00	2 139 885 879.86
Level 14	109.55	27.0%	19 692 497	2 157 313 057.14	18 250 000.00	2 139 063 057.14
Level 15	110.05	26.8%	19 555 093	2 152 038 008.86	18 250 000.00	2 133 788 008.86
Level 16	110.55	26.5%	19 362 937	2 140 572 666.64	18 250 000.00	2 122 322 666.64
Level 17	111.05	26.2%	19 095 875	2 120 596 909.78	18 250 000.00	2 102 346 909.78
Level 18	111.55	25.7%	18 728 000	2 089 108 455.36	18 250 000.00	2 070 858 455.36
Level 19	112.05	25.0%	18 227 569	2 042 399 159.11	18 250 000.00	2 024 149 159.11
Level 20	112.55	24.1%	17 558 485	1 976 207 434.68	18 250 000.00	1 957 957 434.68
Level 21	113.05	22.9%	16 684 524	1 886 185 464.11	18 250 000.00	1 867 935 464.11
Level 22	113.55	21.3%	15 577 374	1 768 810 872.71	18 250 000.00	1 750 560 872.71
Level 23	114.05	19.5%	14 228 308	1 622 738 541.11	18 250 000.00	1 604 488 541.11
Level 24	114.45	17.8%	12 989 220	1 486 616 195.05	18 250 000.00	1 468 366 195.05

Level 25	114.55	17.3%	12 660 620	1 450 274 002.29	18 250 000.00	1 432 024 002.29
Level 26	115.05	15.0%	10 936 639	1 258 260 370.57	18 250 000.00	1 240 010 370.57
Level 27	115.55	12.5%	9 152 484	1 057 569 523.54	18 250 000.00	1 039 319 523.54
Level 28	116.05	10.2%	7 418 795	860 951 192.28	18 250 000.00	842 701 192.28
Level 29	116.55	8.0%	5 834 617	680 024 584.05	18 250 000.00	661 774 584.05
Level 30	117.00	6.3%	4 592 631	537 337 869.01	18 250 000.00	519 087 869.01

Example results.