Sentiment Score Construction with Facebook Comments on US Politics (Results)

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In this presentation, I would show you...

Sentiment Score Introduction

I would quickly introduce three types of Sentiment Scores that I have constructed.

I humorously named them "ABC Scores", which stands for Aspect-based Sentiment, Binary Sentiment Labels, and Continuous Sentiment Scores collectively.

Analytical Graphic Results

Then, I would show the graphical results of the ABC scores.

The result is arguable predictive of the US Presidential Election in 2016, where Donald Trump and Hillary Clinton competed against each other.

In many ways, we can see that Hillary Clinton was falling behind Donald Trump. Thus, it should be no surprise that Donald Trump was elected president in the end.

Sentiment Score Introduction

Analytical Graphic Results

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Three Types of Sentiment Scores

Pick one model

- **Aspect-based Sentiment = sadness, joy, love, anger, fear, surprise**

Combine multiple models

- **Binary Sentiment labels = POSITIVE, NEGATIVE**
- **Continuous Sentiment Scores = [-1, +1]**

"ABC Scores"

Sentiment Score Introduction

Aspect-based Sentiment

	BERT_sadness	BERT_joy	BERT_love	BERT_anger	BERT_fear	BERT_surprise	BERT_emotion_highest
0	0.001692	0.034497	0.203237	0.750804	0.002372	0.007398	anger
1	0.028839	0.114509	0.003014	0.846426	0.005269	0.001943	anger
2	0.019148	0.506111	0.004474	0.462502	0.005904	0.001861	joy
3	0.033257	0.925305	0.003607	0.033050	0.003652	0.001128	joy
4	0.001002	0.935860	0.061434	0.000601	0.000400	0.000703	joy

- **Each row represents a comment**
- **Each column represents a type of emotion**
- **Each cell represents a score for the emotion in a specific comment**

Sentiment Score Introduction

Binary Sentiment labels

- **Take a majority vote out of five BERT models**

distilBERT_label	RoBERTa_large_label	RoBERTa_tweet_binaryLabel	BERT_star_binaryLabel	BERT_emotion_binaryLabel	majority_vote
POSITIVE	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE
NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE	NEGATIVE
NEGATIVE	NEGATIVE	NEGATIVE	POSITIVE	POSITIVE	NEGATIVE
NEGATIVE	NEGATIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE
POSITIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE	POSITIVE

Majority Vote **Result**

	distilBERT_label	RoBERTa_large_label	RoBERTa_tweet_binaryLabel	BERT_star_binaryLabel	BERT_emotion_binaryLabel	majority_vote
NEGATIVE	1482475	1418657	1637680	1372605	1509082	1491074
POSITIVE	1065995	1129813	910790	1175865	1039388	1057396

Continuous Sentiment Scores

- **Selective Averaging**

distilBERT_score	RoBERTa_large_score	RoBERTa_tweet_score	BERT_star_scaledScore	BERT_emotion_score	majority_vote	selective_mean
0.990771	-0.998820	-0.964068	-0.727313	-0.750804	NEGATIVE	-0.860251
-0.998380	-0.999445	-0.926214	-0.287519	-0.846426	NEGATIVE	-0.811597
-0.999461	-0.994421	-0.829197	0.275097	0.506111	NEGATIVE	-0.941026
-0.948954	-0.773979	0.564369	0.583888	0.925305	POSITIVE	0.691187
0.999525	0.998621	0.953136	0.927033	0.935860	POSITIVE	0.962835

Selective Averaging **Result**

- **This gives us the magnitude of how positive or negative a comment is.**

Sentiment Score Introduction

Analytical Graphic Results

Analytical Graphic Results

Aspect-based Sentiment

		NEG	POS	POS	NEG	NEG	POS	
		BERT_sadness	BERT_joy	BERT_love	BERT_anger	BERT_fear	BERT_surprise	BERT_emotion_highest
page_name								
Donald J. Trump		0.074530	0.535005	0.019349	0.321067	0.04240	0.007648	joy
Hillary Clinton		0.087551	0.489037	0.021095	0.350155	0.04531	0.006852	joy

Trump wins

Hillary wins

Trump wins

This shows that Hillary was falling behind Trump, somewhat predictive of the US presidential result in 2016.

Analytical Graphic Results

Binary Sentiment Labels

page_name	post_id	majority_vote
Donald J. Trump	153080620724_10154994141850725	NEGATIVE
	153080620724_10154994200030725	POSITIVE
	153080620724_10154997068045725	POSITIVE
	153080620724_10155009354115725	POSITIVE
	153080620724_10155024375830725	POSITIVE
...	...	...
Hillary Clinton	889307941125736_999748683414994	NEGATIVE
	889307941125736_999824783407384	NEGATIVE
	889307941125736_999835160073013	NEGATIVE
	889307941125736_999865193403343	NEGATIVE
	889307941125736_999866820069847	POSITIVE

6534 rows × 1 columns

majority_vote	pct
NEGATIVE	55.40%
POSITIVE	44.60%

majority_vote	pct
NEGATIVE	68.60%
POSITIVE	31.40%

This shows that Hillary was falling behind Trump, somewhat predictive of the US presidential result in 2016.

Analytical Graphic Results

Continuous Sentiment Scores

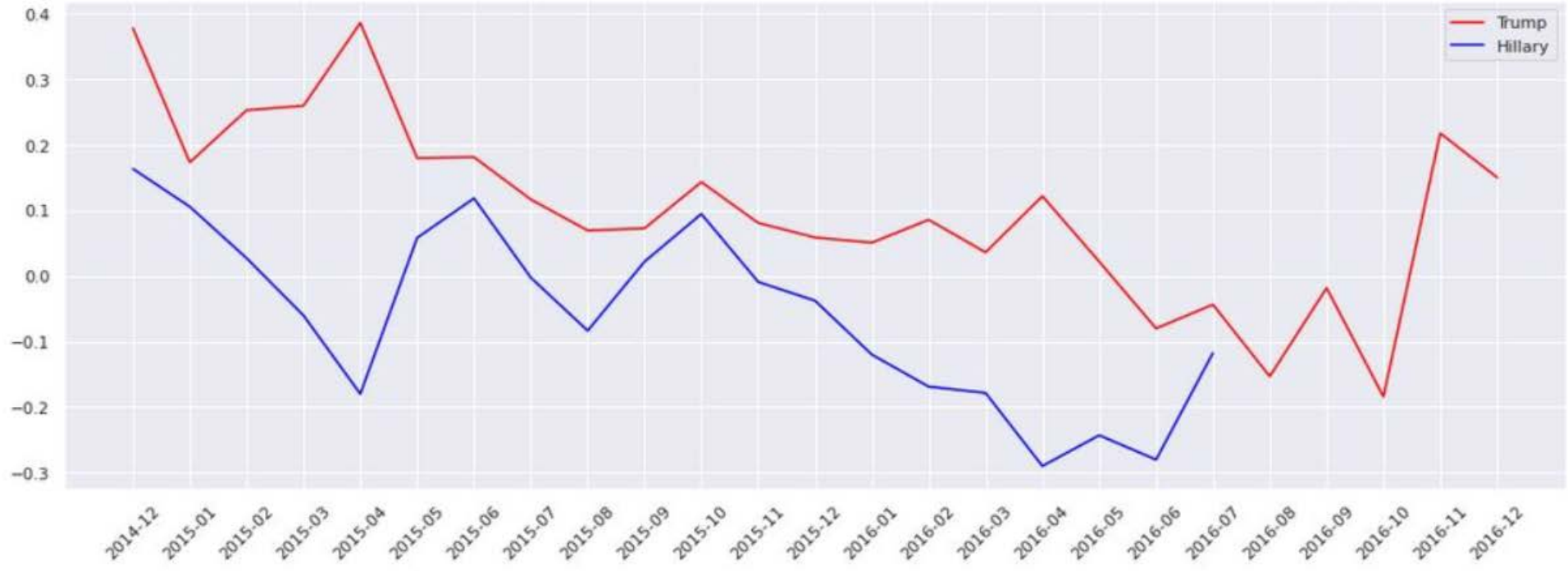
page_name	post_id	selective_mean
Donald J. Trump	153080620724_10154994141850725	-0.597309
	153080620724_10154994200030725	0.790403
	153080620724_10154997068045725	0.458304
	153080620724_10155009354115725	0.831108
	153080620724_10155024375830725	0.901359
...	...	...
Hillary Clinton	889307941125736_999748683414994	-0.861027
	889307941125736_999824783407384	-0.782836
	889307941125736_999835160073013	-0.913890
	889307941125736_999865193403343	-0.009094
	889307941125736_999866820069847	0.817181

page_name	selective_mean
Donald J. Trump	0.024271
Hillary Clinton	-0.139765

This shows that Hillary was falling behind Trump by 15%, somewhat predictive of the US presidential result in 2016.

Analytical Graphic Results

Continuous Sentiment Scores

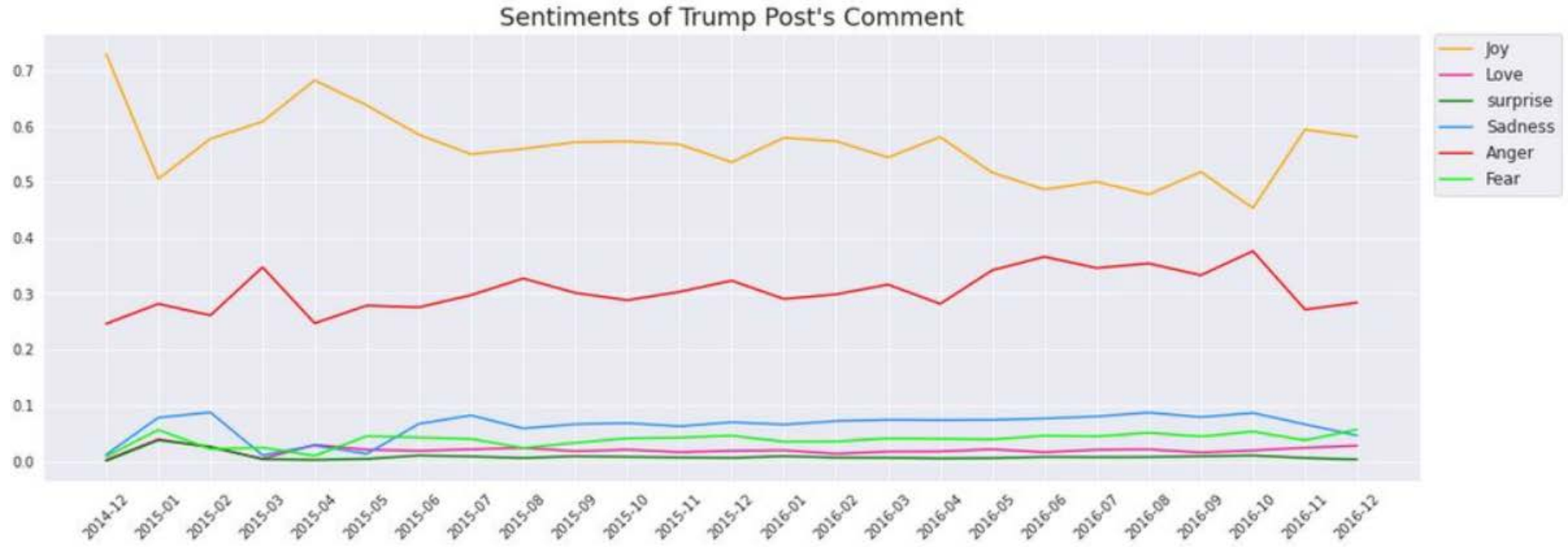


This graph mimics a social listener software.

We can see that Hillary was behind Trump throughout the years.

Analytical Graphic Results

Aspect-based Sentiment

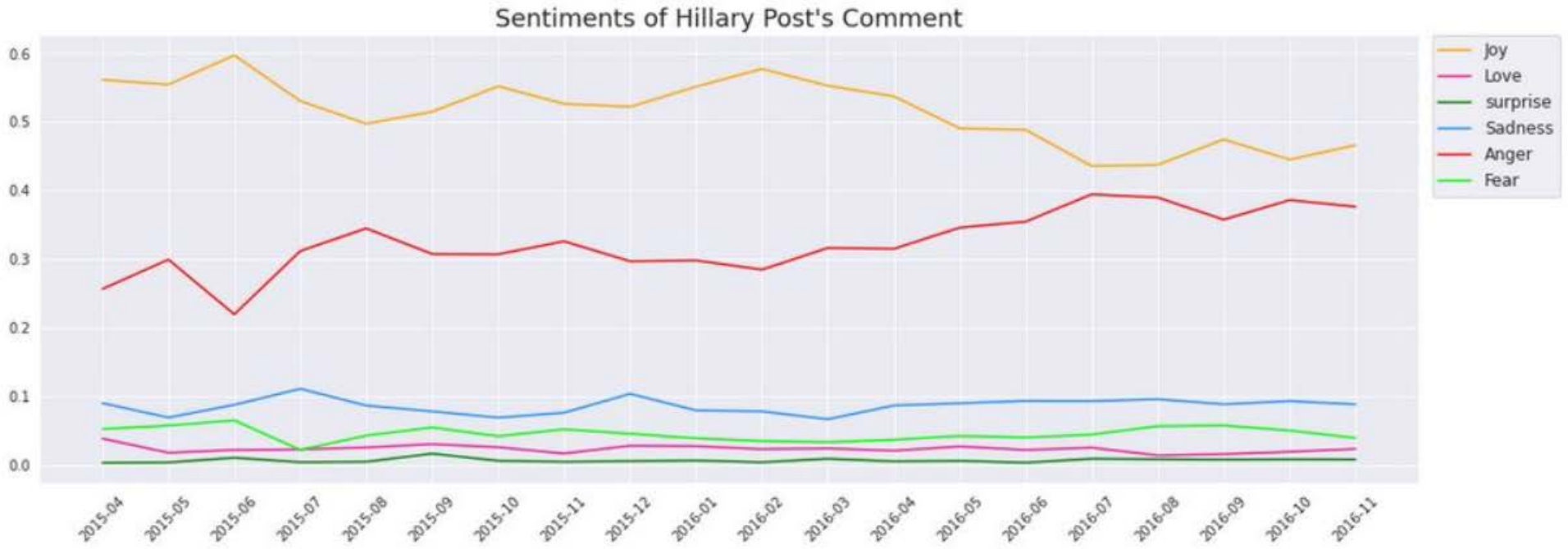


The average score for joy is near 0.6.

The average score for anger is about 0.3.

Analytical Graphic Results

Aspect-based Sentiment

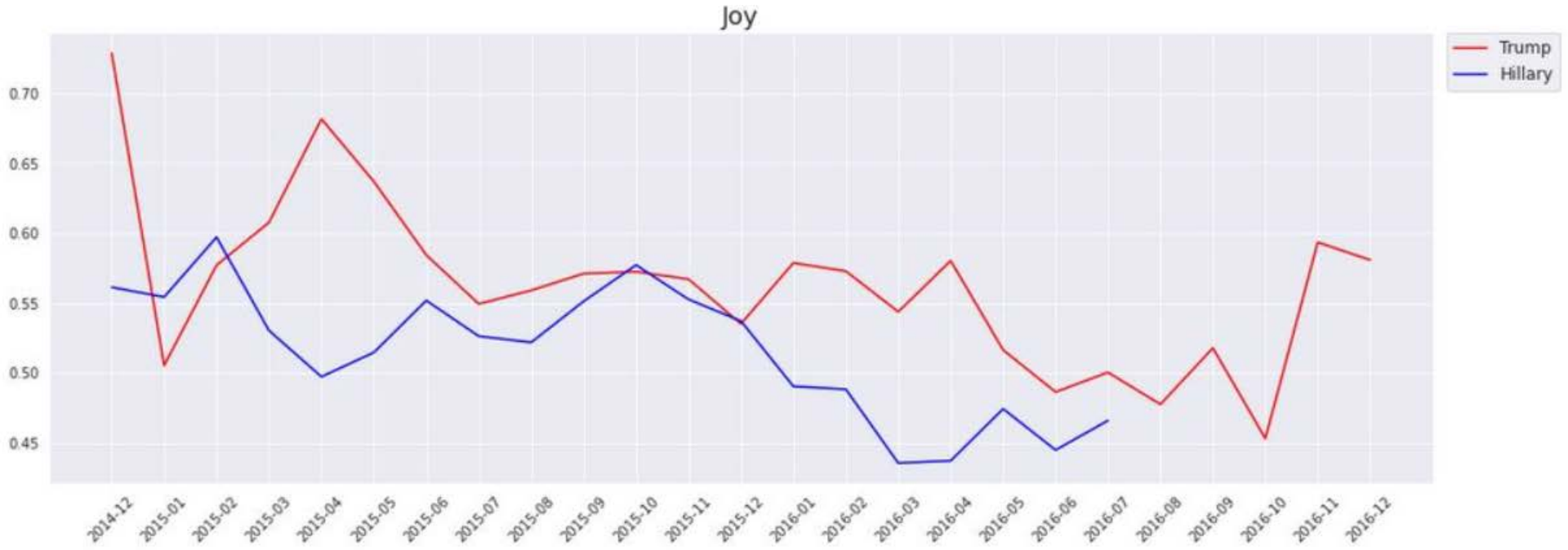


The average score for joy is only about 0.5.

The average score for anger is about 0.3, too.

Analytical Graphic Results

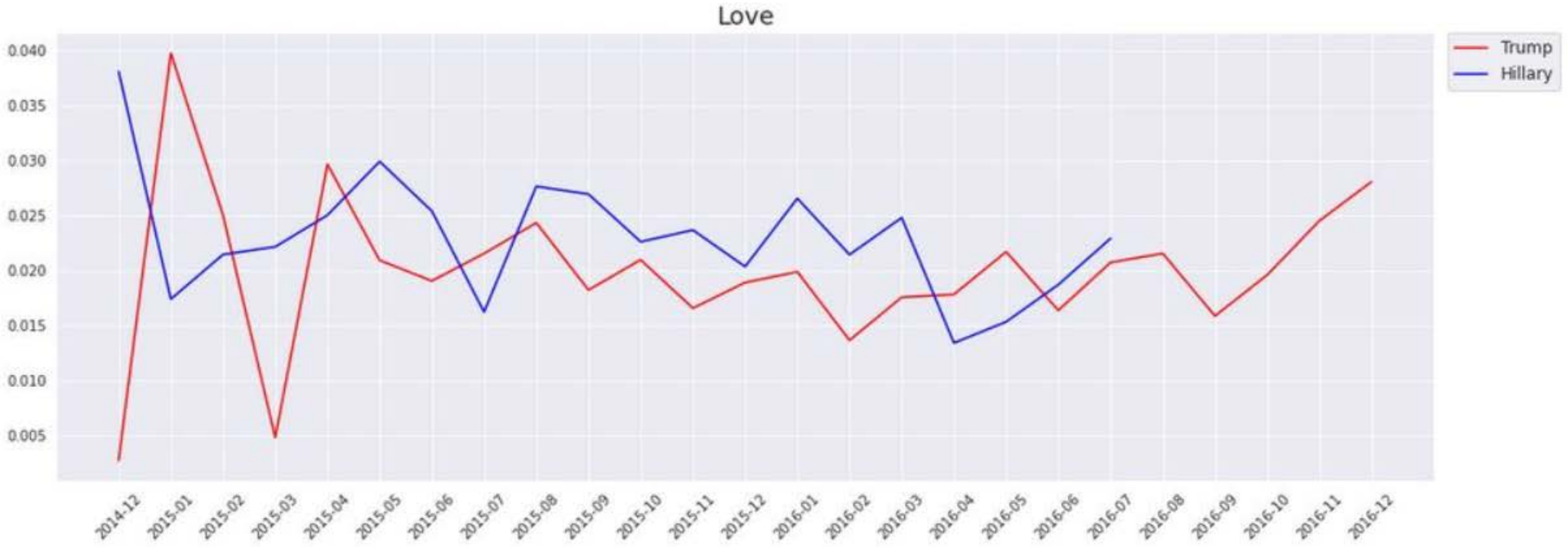
Aspect-based Sentiment



Trump had higher score in joy than Hillary.

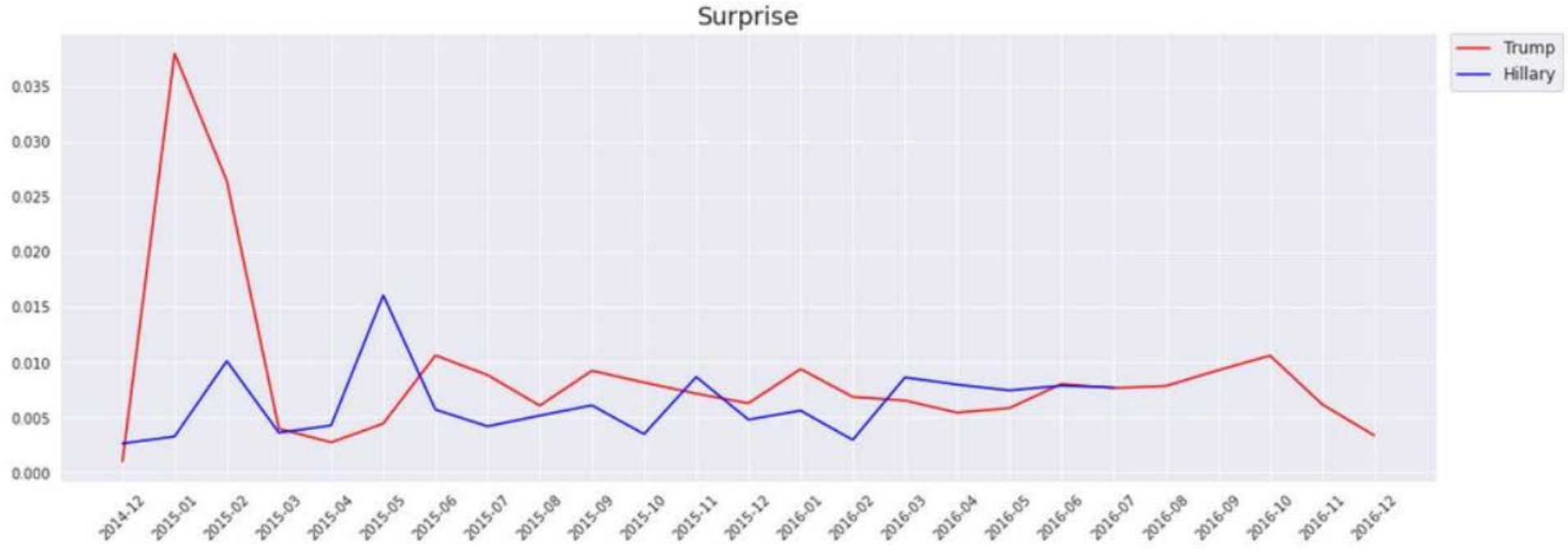
Analytical Graphic Results

Aspect-based Sentiment



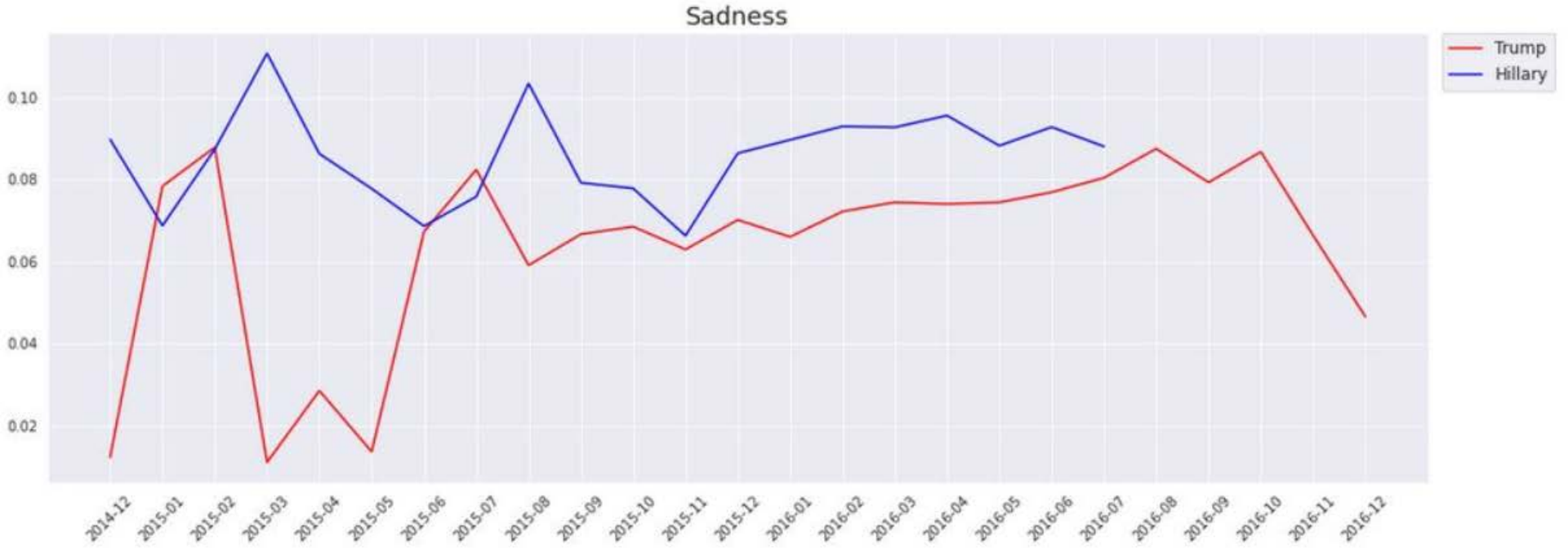
Analytical Graphic Results

Aspect-based Sentiment



Analytical Graphic Results

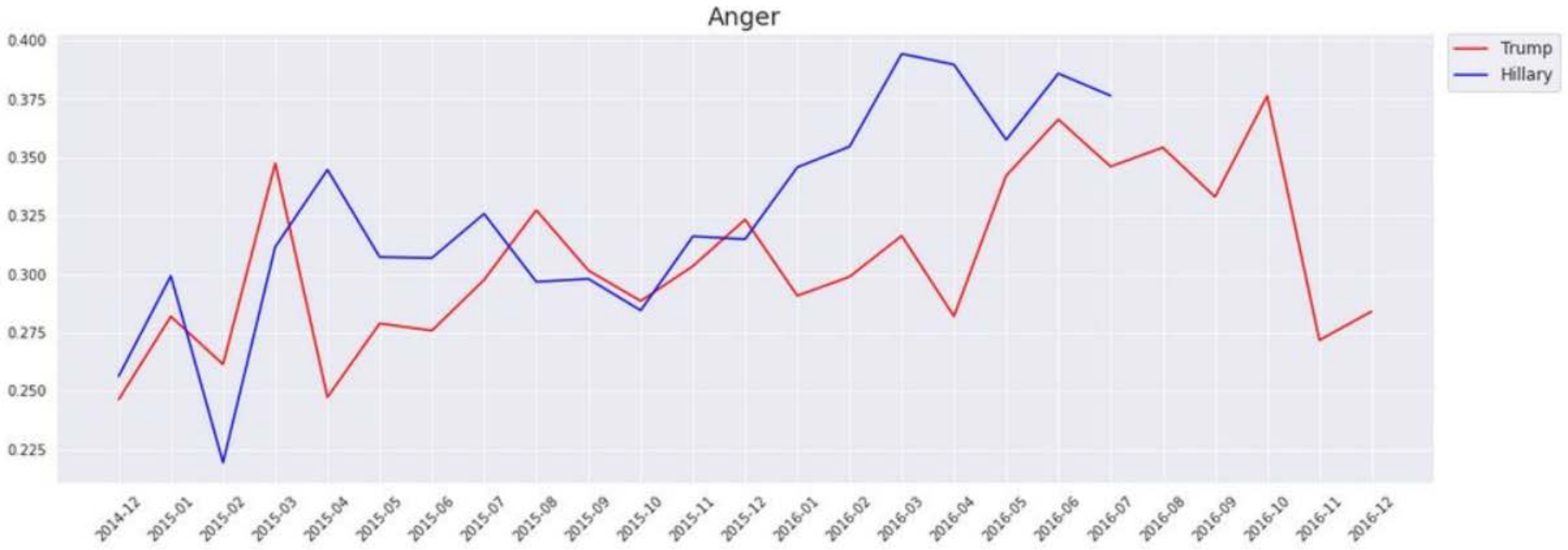
Aspect-based Sentiment



Trump had lower score in sadness than Hillary.

Analytical Graphic Results

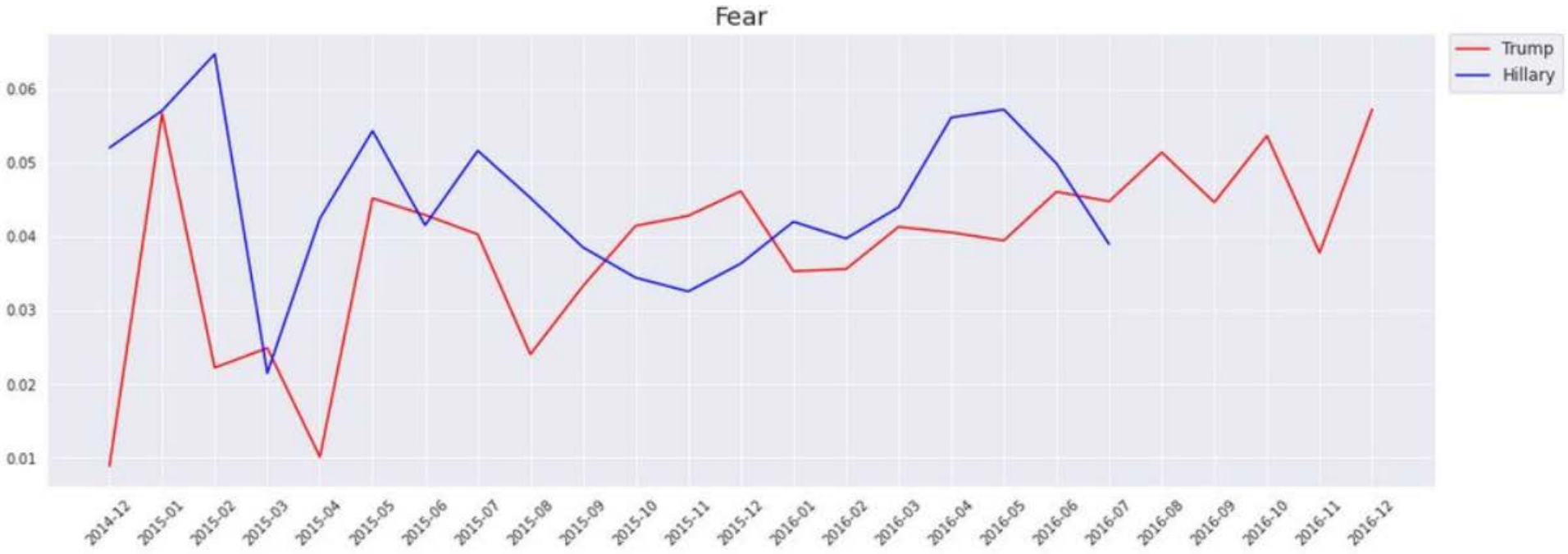
Aspect-based Sentiment



Trump had lower score in anger than Hillary (in general).

Analytical Graphic Results

Aspect-based Sentiment



Trump had lower score in fear than Hillary.


THANKS
謝謝大家