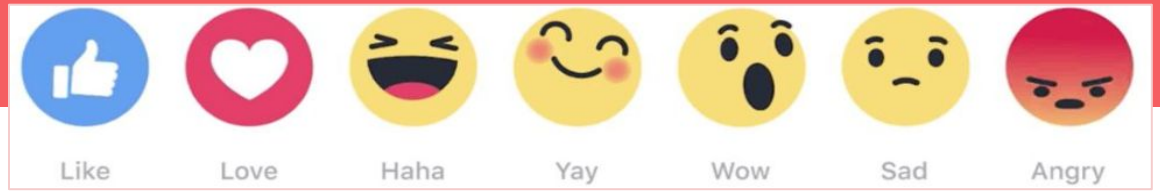
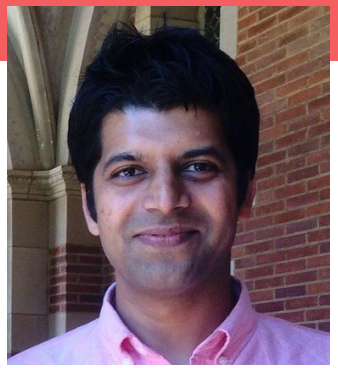
EmoTag1200 👍: Understanding the Association between Emojis 😄 and Emotions 😻





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EMNLP 2020

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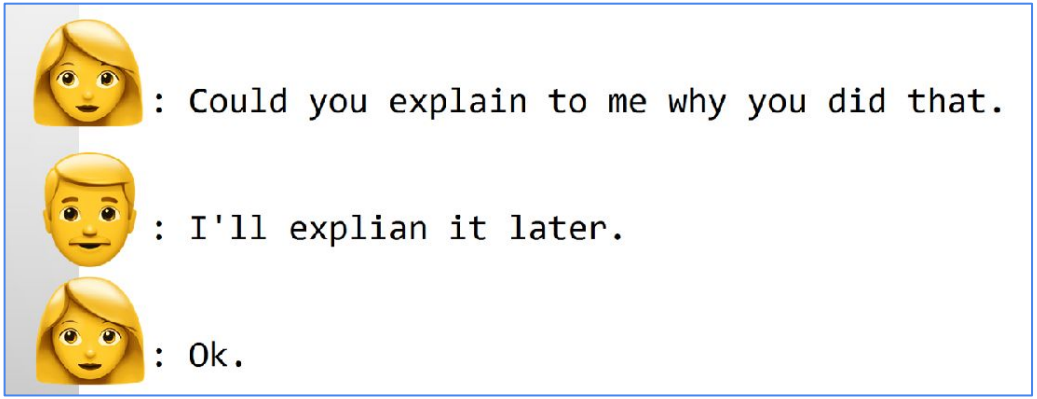
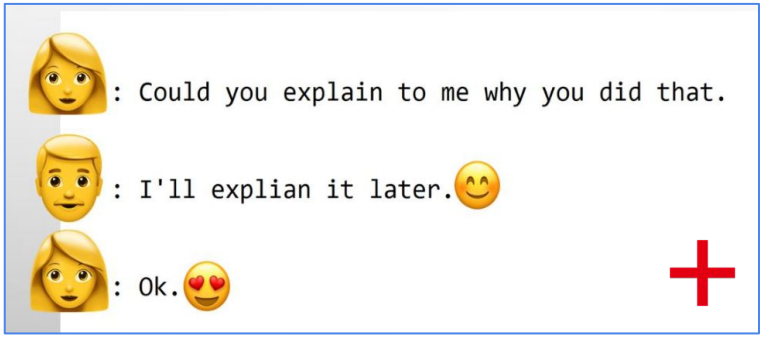
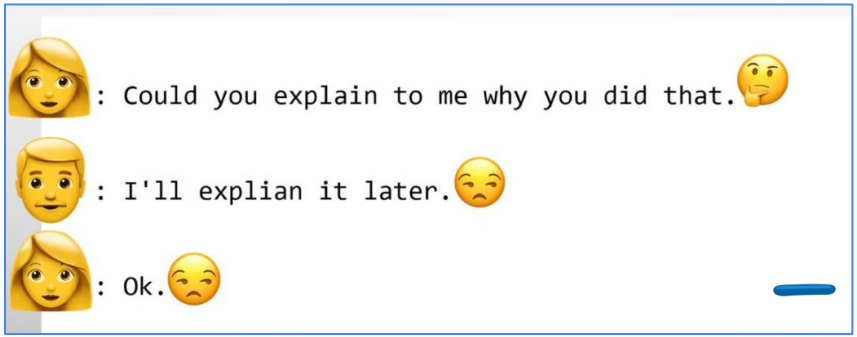
Plain Text vs +ve Emojis vs −ve Emojis

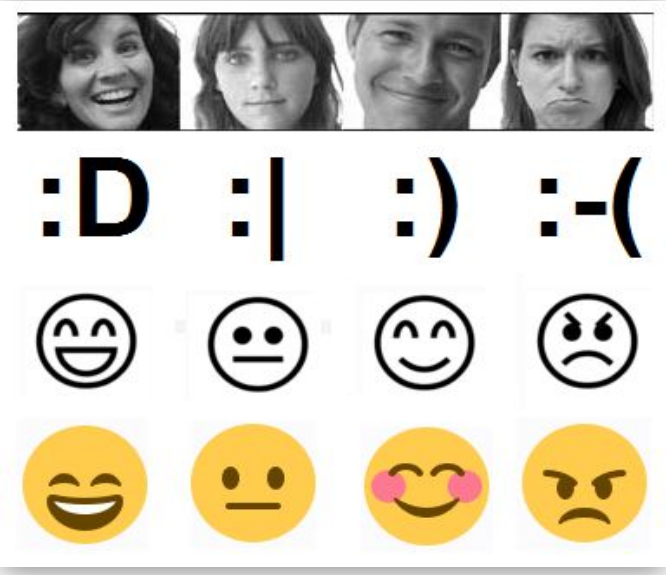




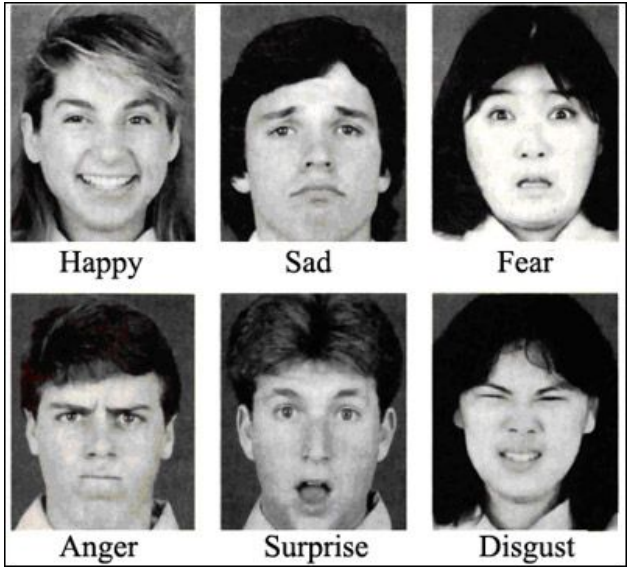


Source: Shatha Ali A Hakami, The Importance of Understanding Emoji : An Investigative Study, 2017

Emojis and Emotion



Emoji vs Facial Expression[1]



Ekman's 6 Basic Emotions

1: Emoticons in mind: An event-related potential study by Churches et al. (2014)

EmoTag 1200

1,200 emoji–emotion ratings
to better understand the association between emojis and emotions

0.25
Anticipation

0.92
Joy

1.00
Anger

0.5
Fear

0.72
Trust

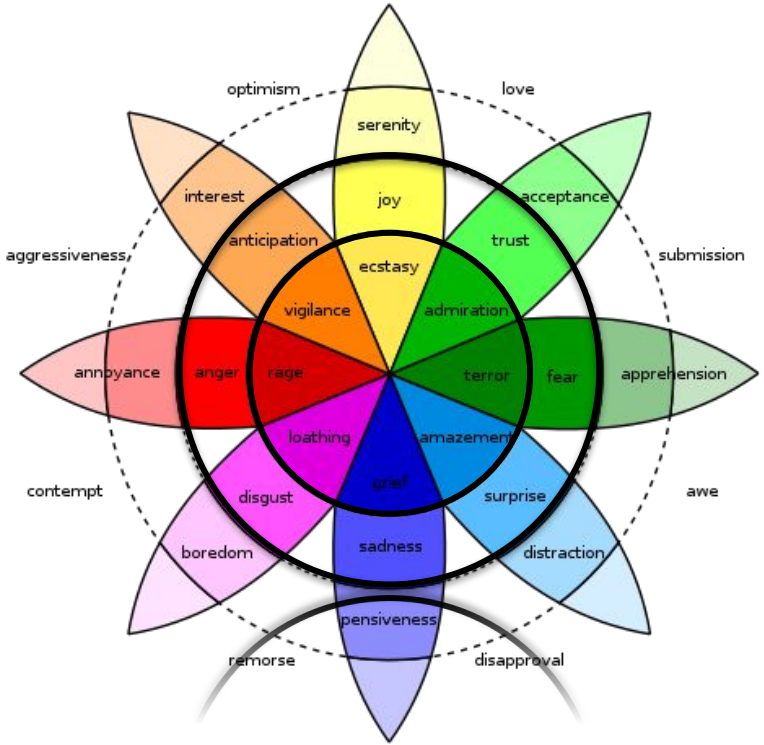
Annotation Task

- 8 Emotions
- 5 Association Levels (0-4)
- Total 150 Popular Emojis

Please rate to what extent you believe the following emojis are associated with each of the listed emotions. The scores range from 0 (no association) to 4 (very strong association).

Unicode	Twitter Image	Emoji	Anger	Anticipation	Disgust	Fear	Joy	Sadness	Surprise	Trust
			your email							
1f622	😢	crying face	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4
1f605	😅	smiling face with open mouth and cold sweat	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4
1f609	😉	winking face	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4
1f64f	🙏	person with folded hands	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4	○0 ○1 ○2 ○3 ○4

https://shoeb.info/emotag/experiment/

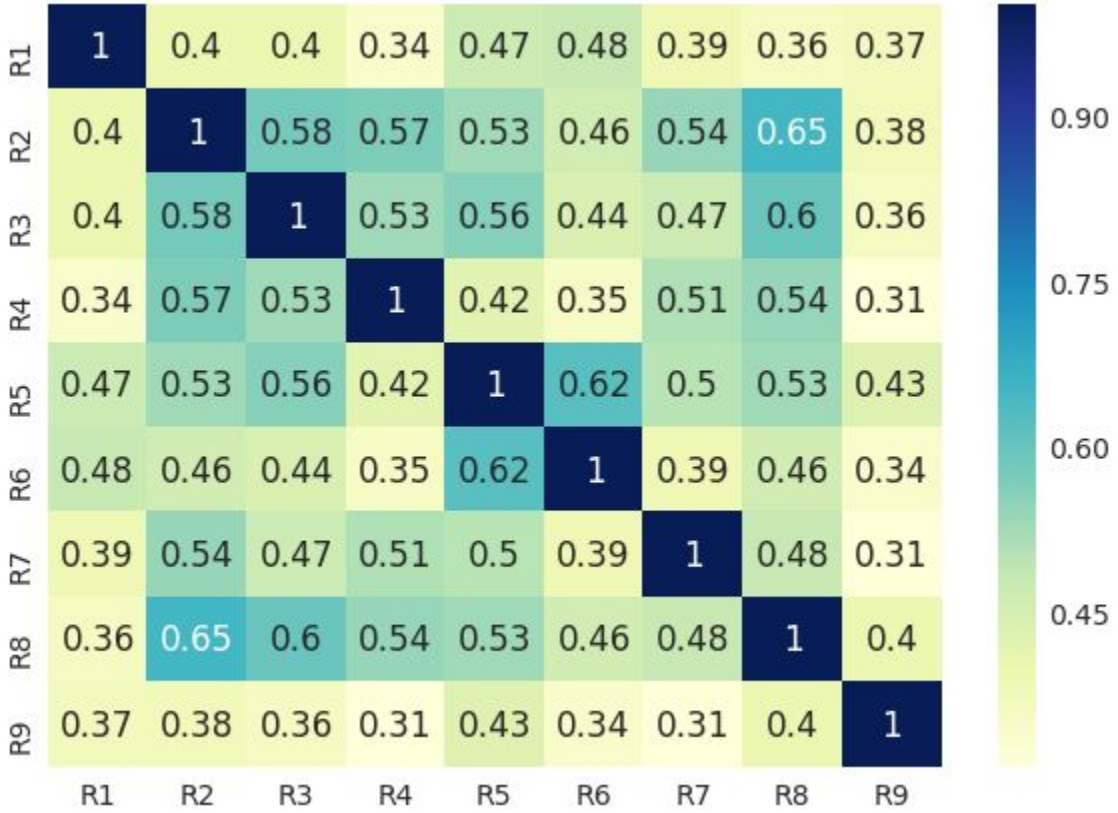


Plutchik's Wheel of Emotions

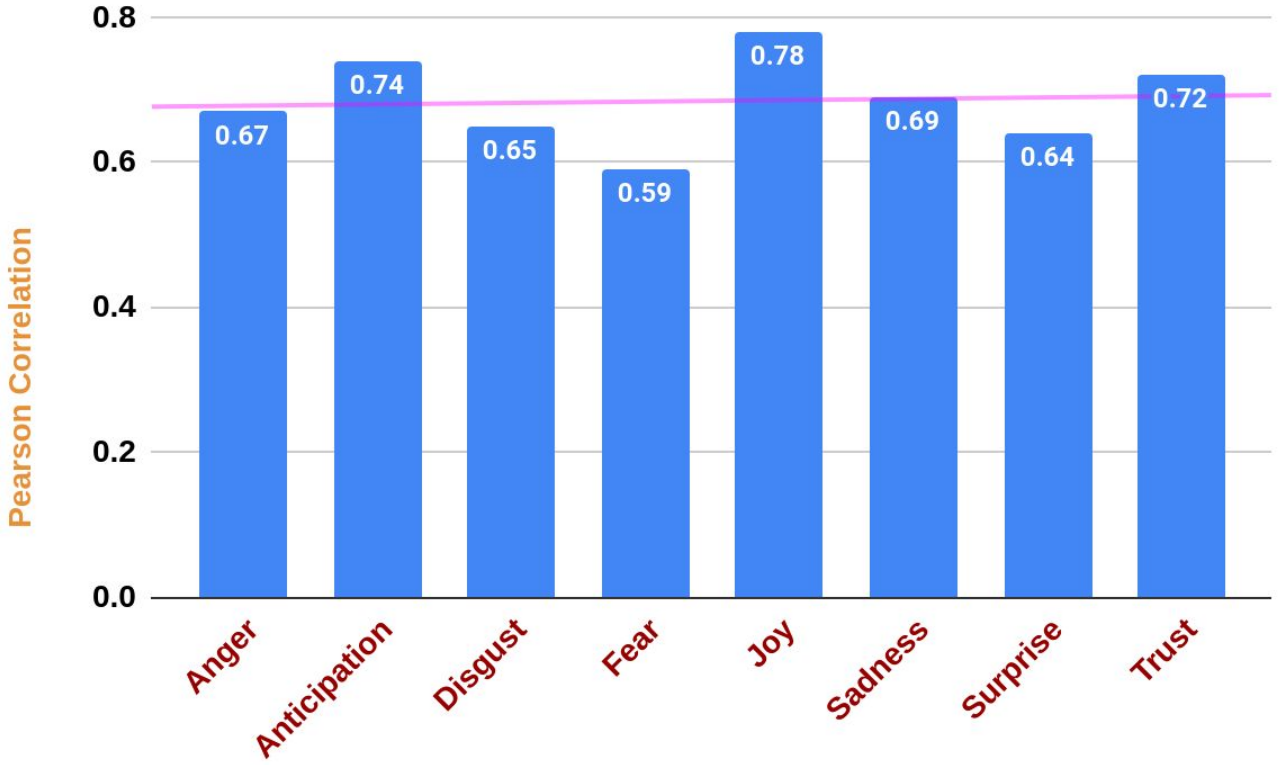
Annotation Process

- Each final rating is an average of 9 human ratings
  - Consistent set of 9 human annotators
  - Native/near-native speakers of English, age 25–35
  - Extensive prior experience in using emojis for communication
- Annotation Setup
  - Raters were asked to do one set of 25 emojis per day
  - The order of emojis was randomized for each rater

Overall Inter-Annotator Agreement



Correlation between Rater & Gold Scores



Prediction Experiments

Can You Predict Emotion?

To make it easy, a short list of emotions are given for a particular emoji.

👎 (Disgust or Fear or Joy) Disgust

🎂 (Joy or Surprise or Trust) Joy

🌹 (Joy or Surprise or Trust) Trust

Comparison of Different Prediction Models

Source	Anger	Anticip.	Disgust	Fear	Joy	Sadness	Surprise	Trust	Average
GloVe	0.05	0.05	0.11	0.09	0.34	-0.05	**0.18**	0.18	0.12
EmoTag + EmoLex	0.62	-0.03	**0.81**	0.50	0.19	0.57	-0.27	-0.04	0.29
EmoTag + NRC-EIL	**0.74**	**0.23**	0.59	**0.65**	**0.72**	0.74	0.08	**0.46**	**0.53**
EmoTag + DepecheMood++	0.58	N/A	N/A	0.37	0.41	**0.78**	0.10	N/A	0.44
Human Agreement	0.67	0.74	0.65	0.59	0.78	0.69	0.64	0.72	0.69

Pearson Correlation scores for all considered prediction methods. Bolded scores represent the highest correlation observed for the emotion in the respective column except for the human agreement score.

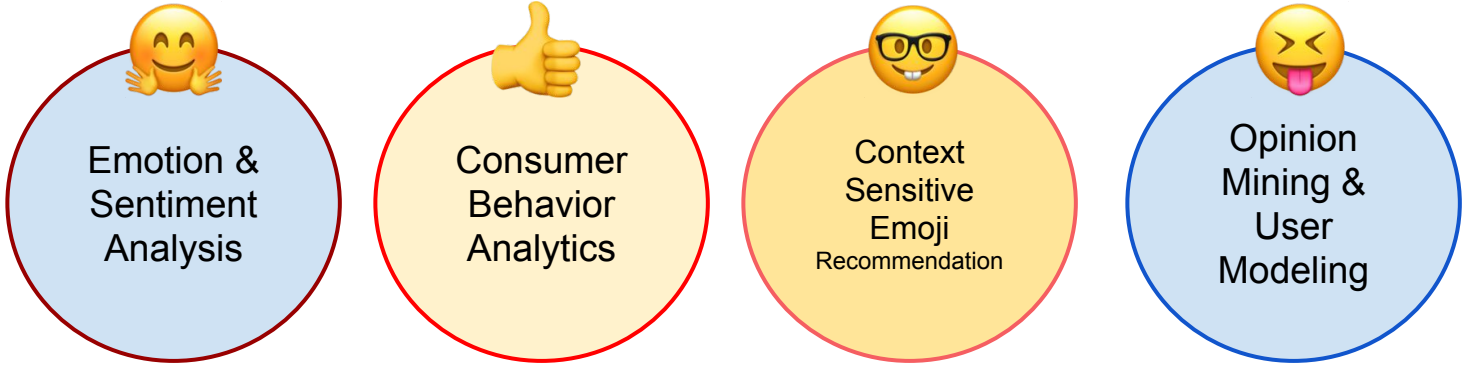
Top-Ranked Emotion Intensive Emojis

Emotions	Top 150 Emojis (EmoTag1200)	Other Predicted Emojis (excluding Top 150)
Anger	Angry Face Pouting Face Face with Steam from Nose	Japanese Goblin Japanese Ogre Hocho
Anticipation	Eyes Thought Balloon Money Bag	Fireworks Shooting Star Person with Veil
Disgust	Confounded Face Persevering Face Thumbs Down	Ant Japanese Ogre Astonished Face
Fear	Fearful Face Face Screaming in Fear Anxious Face with Fear	Hocho Japanese Ogre Japanese Goblin
Joy	Smiling Face Grinning Squinting Face Face with Tears of Joy	Birthday Cake Confetti Ball Heart with Ribbon
Sadness	Crying Face Loudly Crying Face Broken Heart	Hocho Baby Angel Crying Cat Face
Surprise	Double Exclamation Mark Exclamation Mark Face Screaming in Fear	Face with Open Mouth Dizzy Face Weary Cat
Trust	Kissing Face with Smiling Eyes Two Hearts Rose	Church Family Anchor

Conclusion: EmoTag1200

- We created the first resource describing emoji–emotion pairs
- We found that ratings can be predicted automatically based on emotion data

Potential Use Cases



Thank You!

A Big Thanks to All Our Annotators

Contact - abu.shoeb@rutgers.edu
All resources can be found at http://emoji.nlproc.org

Available Downloads: EmoTag1200 || Emoji-Centric Tweets || EmoTag Vectors || Word–Emoji Co-Occurrences