Sentiment inference from emojis



A layered approach to textual analysis

INTRODUCTION

Hi 👋
I’m Livia Teernstra

What are emojis?

How are they used?

What can we learn from them?

Proposed Research

Caveats

Final thoughts

Emojis

Upgraded ASCII Art:

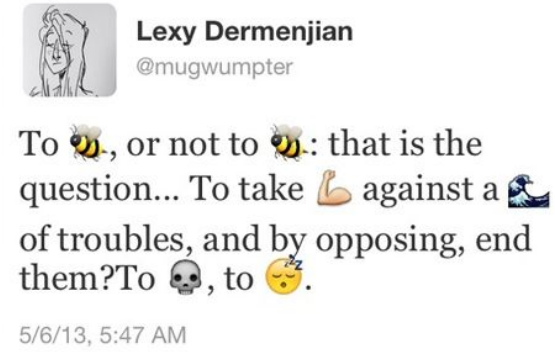
- An emoticon **;)**
- An emoji 😉

Pervasive, worldwide use 🌎

- July 17 is world emoji day

Can be used to **replace** words, or to **emphasise** the message:

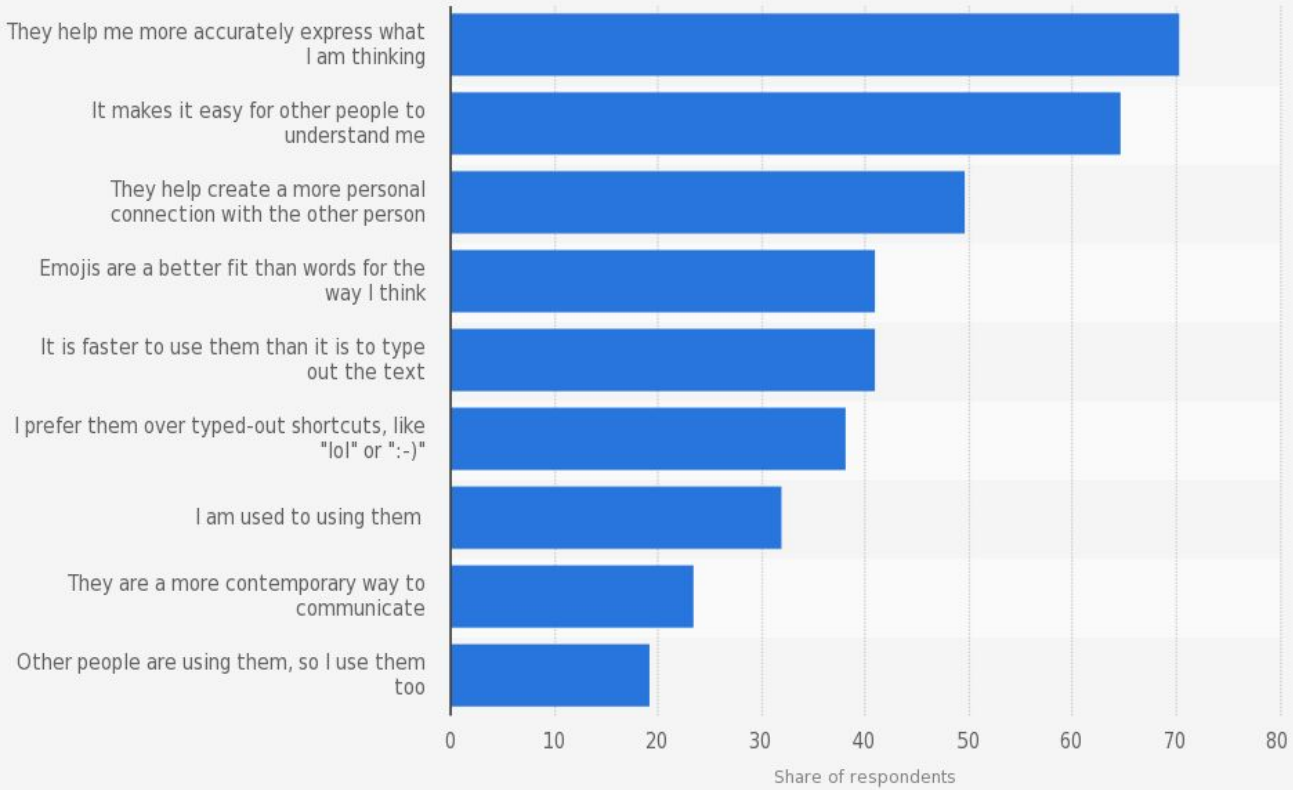
- I 💙 you
- Can we have chicken for dinner? 🍗 🍽️



Provides **emotional** context to statements

- Emotional context is normally garnered through natural language processing, text analysis and computational linguistics

Leading reasons for using Emojis according to U.S. internet users as of August 2015



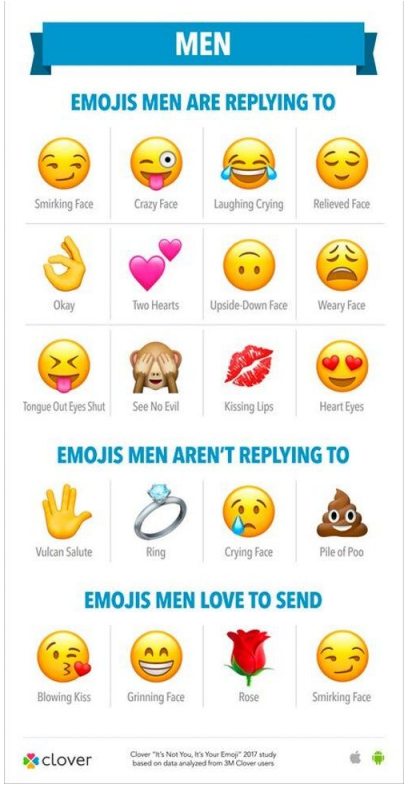
Sources::
eMarketer; Various sources (Emogi)
© Statista 2015

Additional Information:
United States; August 2015; n = 510

statista

Emoji use: men and women on a dating site





Emoji use: Emojis replacing text?

Emojis are evolving into a discrete language (Instagram, 2015)



However, replacing words with emojis leads to significantly longer reading times (Gustafsson, 2017)

What can we learn from emojis?

- Personality types (Marengo et al., 2017)
  - Emotionally stability negatively correlates with: 😞 😔 😢
- Which emojis are likely to elicit a response (Clover, 2017; Howard, 2016; Tang, 2017)
- How people feel about certain foods (Jaeger et al., 2017)
  - Happy emojis associated with popular food (lasagna, strawberries, etc)
- How people feel about certain brands (Zimbra et al., 2016)

Thus, emojis allow for **sentiment extraction.**

Proposed study

Research Question: How can we use emojis to better understand the emotional response to events such as the Brexit?

- Does the sentiment of discourse change through the inclusion of emojis in classification?
- Relation between emojis and hashtags/URLs
- Relation between emojis

Using emojis as a **supplemental** information layer.

A starting point for research: The emojis of the Brexit (Azhar, 2016)

Tweets gathered from the **day after the election** - an emotional "snapshot"

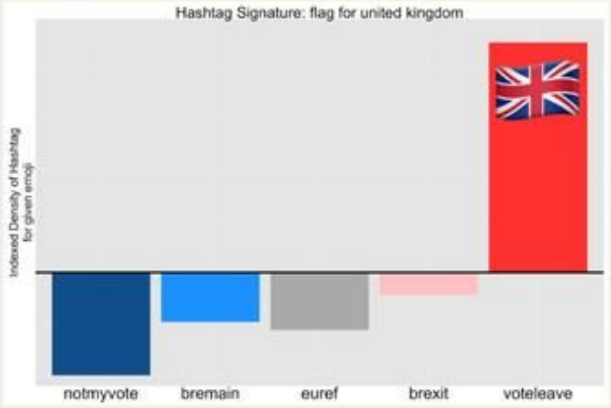
- 34 percent of tweets with the British flag emoji also include the #VoteLeave hashtag.
- The crying emoji was used alongside #VoteRemain

Brexit chatter includes a wide variety of emojis

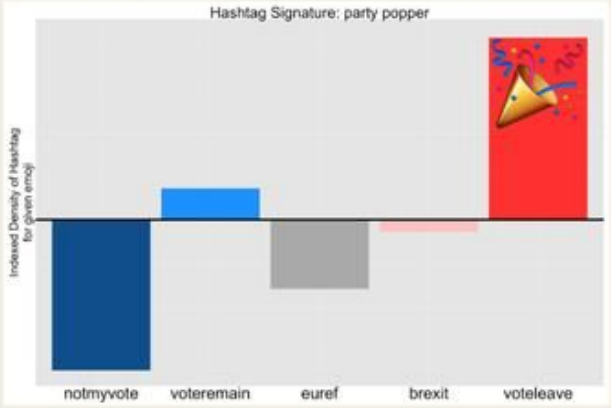
emoji	emoji name	brexit rank	brexit count	brexit density *(per 1,000)*
😂	face with tears of joy	1	285	11.9
🇬🇧	flag of united kingdom	2	249	10.4
👍	thumbs up sign	3	75	3.1
👏	clapping hands sign	4	70	2.9
❤️	heavy black heart	5	60	2.5
😭	loudly crying face	6	48	2.0
😔	pensive face	7	40	1.7
😩	weary face	8	38	1.6
😢	crying face	9	34	1.4
🙈	see-no-evil monkey	10	34	1.4

Of every 1,000 tweets in our dataset, 11.9 of them contain 😂

The UK flag emoji heavily over-indexes on #VoteLeave



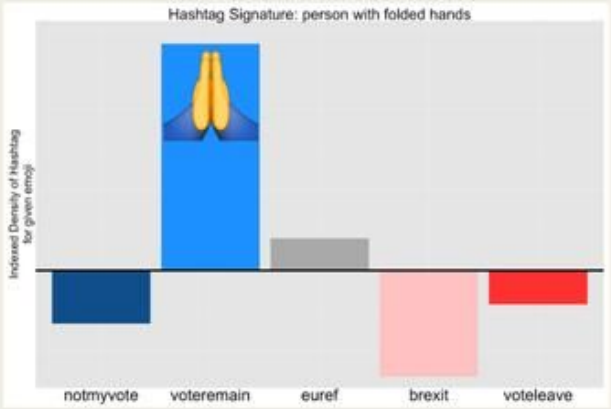
The celebratory emojis also over-index on #VoteLeave



Meanwhile, #VoteRemain is crying...

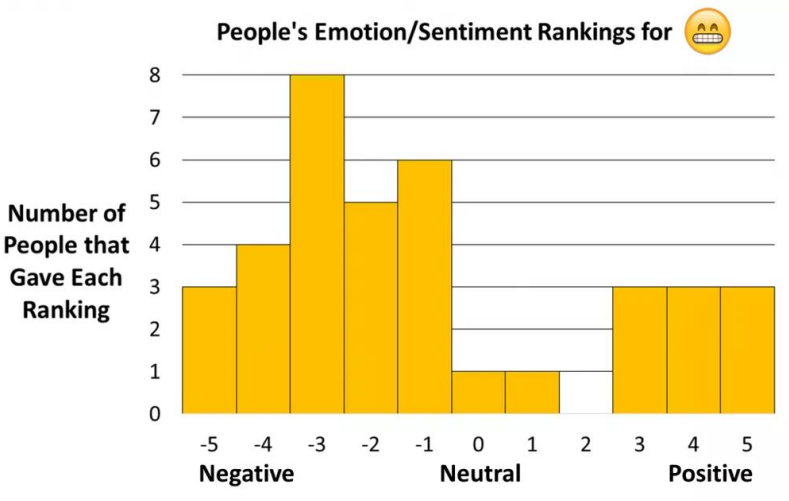


...and praying for the best



(Azhar, 2016)

Issue: Interpretations of emojis



(GroupLens, 2016)

Emojis can be interpreted in different ways (Miller, 2016):

- People disagree on the underlying sentiment of emojis 25% of the time
- Significant potential for miscommunication



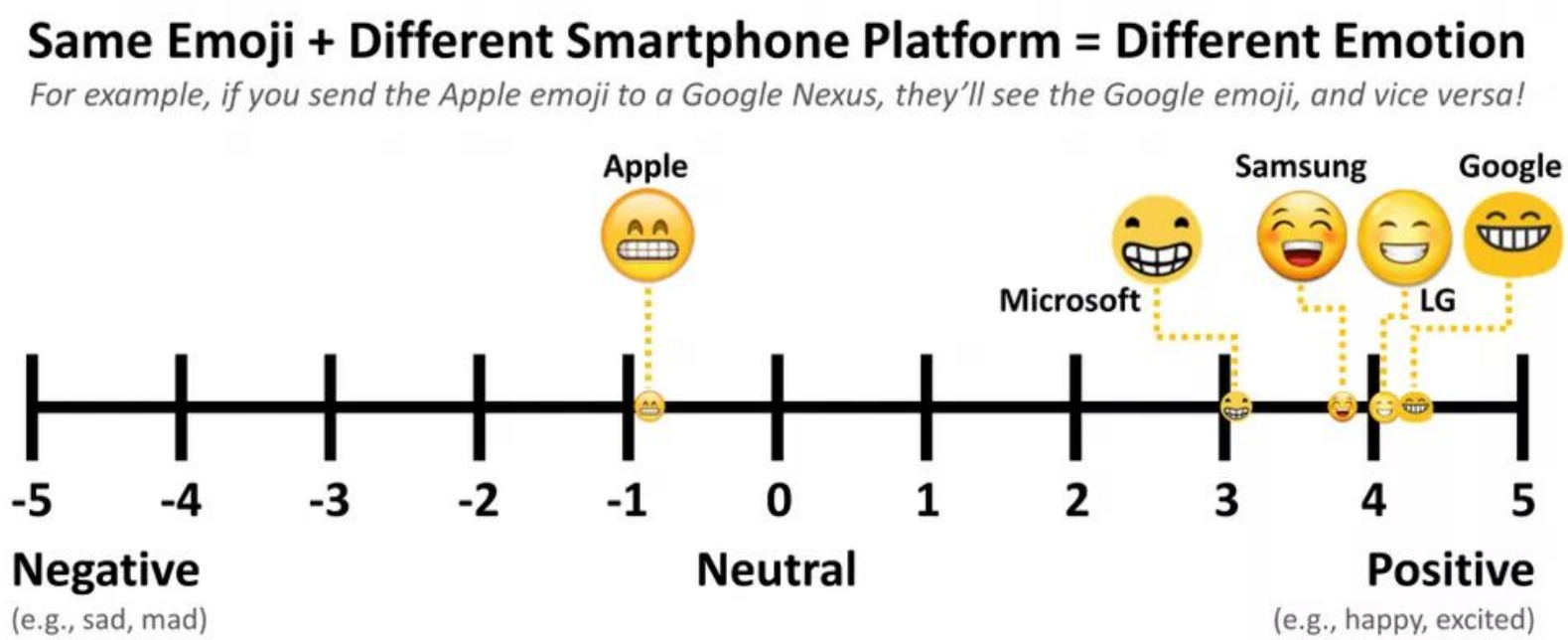
Thumbs up used both sincerely, but also ironically





(Azhar, 2016)

More emoji, More problems



(GroupLens, 2016)

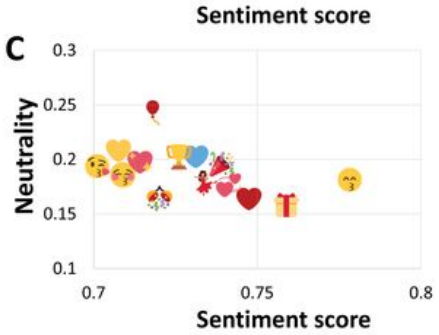
But, All is not lost

DeepMoji can detect sarcasm (Knight, 2017)

- General sarcasm, hyperbole and rhetorical questions

Sentiment of emoji is predicted from the sentiment of the Tweet (Novak et al., 2015):

- Thus emojis can be ranked on a neg-pos dimension



Cosine similarity between words and emojis (Instagram, 2015)

- 😂 (ranked 1st in emoji usage): lolol, lmao, lololol, lolz, lmfao, lmaoo, lolololol, lol, ahahah, ahahha, loll, ahaha, ahah, lmfaoo, ahha, lmaooo, lolll, lollll, ahahaha, ahhaha, lml, lmfaooo
- 😍 (ranked 2nd in emoji usage): beautifull, gawgeous, gorgeous, perfff, georgous, gorgous, hottt, goregous, cuteeee, beautifullll, georgeous, baeeeee, hotttt, babeee, sexyyyy, perffff, hawttt
- ❤ (ranked 3rd in emoji usage): xoxoxox, xoxoxo, xoxo, xoxoxoxo, xoxoxoxoxo, xoxoxoxox, xxoo, oxox, babycakes, muahhhh, mwahh, babe, boobear, loveyou, bunches, muahhh, muahh, xoxox, muahhhhh
- 👍 (ranked 9th in emoji usage): #keepitup, #fingerscrossed, aswell, haha, #impressed, #yourock, lol, #greatjob, bud, #goodjob, awesome, good, #muchlove, #proudofyou, job, #goodluck
- 😭 (ranked 11th in emoji usage): ughh, ughhh, ughhhh, ugh, uggh, ugghh, ughhhhh, ughhhhhh, ugggh, lolol, wahhhh, rn, oml, uhg, agh, xc, omgg, omfg, omf, lololol, whyyy, loll, wahhhhh, tooo, kms

Pros and cons

Pros

- Richer meaning to be extracted from text
- More complex sentiment can be noted
- Does not have to enforce a pos/neg/neutral grouping

Drawbacks

- Differing interpretations from different coders
- Emoji use only limited to certain age bracket?
- Emojis display differently on different systems



Apple



Google



Samsung

Questions / Comments?





Extra stuff

Watch emoji use on Twitter in real time: http://emojitracker.com/

Romeo & Juliet told in emojis: http://www.mirror.co.uk/tech/can-you-work-out-very-7370523

Emojipedia: https://emojipedia.org

Emoji movie: http://people.com/movies/emoji-movie-exclusive-clip/

Eggplant emoji movie: http://www.nme.com/news/film/netflix-found-director-eggplant-emoji-movie-severed-penis-2108157