



# **A Practical Guide to Sentiment Annotation: Challenges and Solutions**

Saif M. Mohammad

National Research Council Canada

# The Simple Sentiment Questionnaire

## At word level:

- is this word positive, negative, or neutral? (Hu and Liu, 2004)
- does this word have associations with positive, negative, or neutral sentiment? (Mohammad and Turney, 2013)
- which word is more positive? / which word has a greater association with positive sentiment?  
(Kiritchenko et al., 2016; Kiritchenko and Mohammad, 2016b)

## At sentence level:

- is this sentence positive, negative, or neutral?  
(Rosenthal et al., 2015; Rosenthal et al., 2014; Mohammad et al., 2015)

# The Simple Sentiment Questionnaire

- Pros:
  - simple and terse
  - reliant on the intuitions of native speakers of a language
- Cons:
  - lack of specifics leave the annotator in doubt over how to label certain kinds of instances
    - neutral reporting of valenced information
    - sarcastic sentences, or retweets.

# The Semantic-Role based Sentiment Questionnaire

Ask respondents to identify the target of opinion, and the sentiment towards this target of opinion.

(Pontiki et al., 2014; Mohammad et al., 2015; Deng and Wiebe, 2014)

- Pros:
  - more specific involved than the simple sentiment questionnaire
- Cons:
  - still insufficient for handling several scenarios:
    - the emotional state of the speaker
    - positive or negative events or situations

# This Paper

- Outlines a set of sentence types that are especially challenging for sentiment annotation.
- Proposes two annotation schemes that address these challenges:

(erm... to some extent)

1. a **simple sentiment annotation questionnaire** with more precise annotation directions and some additional label categories;
2. a **semantic-role based questionnaire** with additional questions to account for the speaker's emotional state and descriptions of valenced events.

The goal is to foster further thought on sentiment annotation.

# Types of Instances Difficult to Annotate for Sentiment

1. neutral reporting of valenced events/information  
the war has created millions of refugees
2. success or failure of one side w.r.t. another, coupled with support for one side  
[yay! | unfortunately] the coalition captured the rebels
3. when speaker's emotional state is of different polarity than the polarity of opinion expressed  
good too see Donald Trump finally rattled by the reporters
4. sarcasm and ridicule
5. different sentiment towards different targets of opinion

# Types of Instances Difficult to Annotate for Sentiment

6. precisely determining the target of opinion  
glad to see Hillary's lies being exposed
7. supplications and requests  
may god help those displaced by war  
let us come together and say no to divisive politics
8. rhetorical questions
9. quoting somebody else or re-tweeting
10. bringing in personal beliefs (of events or language use) that diverge from the norm

# Sentiment & Questionnaires

Sentiment is applicable to:

1. Speaker's opinion towards someone/something
2. Emotional state of the speaker
3. Emotional impact of events or information

Attempting to capture any sentiment through one question:  
**simple questionnaire**

- Past work mostly captures only 1 and 2

Attempting to capture all three through separate questions:  
**semantic role based questionnaire**

- Past work mostly captures just 1.

## PROPOSED SIMPLE SENTIMENT QUESTIONNAIRE

What kind of language is the speaker using?

1. the speaker is using positive language, for example, expressions of support, admiration, positive attitude, forgiveness, fostering, success, positive emotional state
2. the speaker is using negative language, for example, expressions of criticism, judgment, negative attitude, questioning validity/competence, failure, negative emotion
3. the speaker is using expressions of sarcasm, ridicule, or mockery
4. the speaker is using positive language in part and negative language in part
5. the speaker is neither using positive language nor using negative language

## Notes:

- A good response to this question is one that most people will agree with. For example, even if you think that sometimes the language can be considered negative, if you think most people will consider the language to be positive, then select the positive language option.
- Agreeing or disagreeing with the speaker's views should not have a bearing on your response. You are to assess the language being used (not the views). For example, given the tweet, 'Evolution makes no sense', the correct answer is 'the speaker is using negative language' since the speaker's words are criticizing or judging negatively something (in this case the theory of evolution). Note that the answer is not contingent on whether you believe in evolution or not.

# Types of Instances Difficult to Annotate for Sentiment

1. neutral reporting of valenced events/information
2. success or failure of one side w.r.t. another, coupled with support for one side
3. when speaker's emotional state is of different polarity than the polarity of opinion expressed
4. sarcasm and ridicule
5. different sentiment towards different targets of opinion
6. precisely determining the target of opinion
7. supplications and requests
8. rhetorical questions
9. quoting somebody else or re-tweeting
10. bringing in personal beliefs (of events or language use) that diverge from the norm

## PROPOSED SIMPLE SENTIMENT QUESTIONNAIRE

What kind of language is the speaker using?

addresses\*: 1, 2, 3, 7, 8, 9

avoids: 6

1. the speaker is using positive language, for example, expressions of support, admiration, positive attitude, forgiveness, fostering, success, positive emotional state
2. the speaker is using negative language, for example, expressions of criticism, judgment, negative attitude, questioning validity/competence, failure, negative emotion
3. the speaker is using expressions of sarcasm, ridicule, or mockery
4. the speaker is using positive language in part and negative language in part
5. the speaker is neither using positive language nor using negative language

4

3, 5

1, 2, 8, 9

## Notes:

- A good response to this question is one that most people will agree with. For example, even if you think that sometimes the language can be considered negative, if you think most people will consider the language to be positive, then select the positive language option. 10
- Agreeing or disagreeing with the speaker's views should not have a bearing on your response. You are to assess the language being used (not the views). For example, given the tweet, 'Evolution makes no sense', the correct answer is 'the speaker is using negative language' since the speaker's words are criticizing or judging negatively something (in this case the theory of evolution). Note that the answer is not contingent on whether you believe in evolution or not. 2

# This Paper

- Outlined challenges for sentiment annotation.
- Proposed two annotation schemes that address these challenges:
  - a simple sentiment annotation questionnaire with more precise annotation directions and some additional label categories;
  - a semantic-role based questionnaire with additional questions to account for the speaker's emotional state and descriptions of valenced events.

*A Practical Guide to Sentiment Annotation: Challenges and Solutions*. Saif M. Mohammad, In *Proceedings of the NAACL 2016 Workshop on Computational Approaches to Subjectivity, Sentiment, and Social Media (WASSA)*, June 2014, San Diego, California.

<http://saifmohammad.com/WebPages/ResearchAreas.html>

---

## PROPOSED SEMANTIC-ROLE BASED SENTIMENT QUESTIONNAIRE

Q1. From reading the text, the speaker's emotional state can best be described as:

- *positive state*: there is an explicit or implicit clue in the text suggesting that the speaker is in a positive state, i.e., happy, admiring, relaxed, forgiving, etc.
- *negative state*: there is an explicit or implicit clue in the text suggesting that the speaker is in a negative state, i.e., sad, angry, anxious, violent, etc.
- *both positive and negative, or mixed, feelings*: there is an explicit or implicit clue in the text suggesting that the speaker is experiencing both positive and negative feelings
- *unknown state*: there is no explicit or implicit indicator of the speaker's emotional state

Q2. From reading the text, identify the entity towards which opinion is being expressed or the entity towards which the speaker's attitude can be determined.

This entity is usually a person, object, company, group of people, or some such entity. We will call this the PRIMARY TARGET OF OPINION (PTO). For example, if the text criticizes certain actions or beliefs of a person (or group of persons), then that person or group is the PTO. If the text mocks people who do not believe in evolution, then the PTO is 'people who do not believe in evolution'. If the text questions or mocks evolution, then the PTO is 'evolution'. If you cannot determine sentiment/attitude of the speaker towards a person, group, or object, but you can identify sentiment/attitude towards an action or event, then consider that action or event as the PTO. If there are more than one targets of opinion, then select that target towards which sentiment is stronger.

Q3. What best describes the speaker's attitude, evaluation, or judgment towards the primary target of opinion (PTO)? If the whole text is a quote from somebody else (original author) and there is no indication of speaker's attitude, then answer below considering the original author as the speaker.

- *positive*: there is an explicit or implicit clue in the text suggesting that the speaker's attitude or judgment of the PTO is positive (speaker is appreciative, thankful, excited, optimistic, or inspired by the primary entity)
- *negative*: there is an explicit or implicit clue in the text suggesting that the speaker's attitude or judgment of the PTO is negative (speaker is critical, angry, disappointed in, pessimistic, expressing sarcasm about, or mocking the primary entity)
- *mixed*: there is an explicit or implicit clue in the text suggesting that the speaker's attitude or judgment of the PTO is both positive and negative
- *unknown*: there is no explicit or implicit clue indicating that the speaker feels positively or negatively

Q4. What best describes the sentimental impact of the primary target of opinion (PTO) on most people?

- *positive*: the PTO is considered predominantly positive
  - *negative*: the PTO is considered predominantly negative
  - *mixed (both positive and negative)*: some aspects of the PTO are positive and some are negative
  - *mixed (opposing sides)*: the PTO is considered positive by a large group of people AND is considered negative by another large group of people
  - *no sentiment*: there is no clear sentiment associated with the PTO
-

### Examples:

- For Q1:
  - Text: *Mugabe killed millions during his rule*  
Answer: unknown state (since there is no clue about the emotional state of the speaker)
  - Text: *Arggh! When will politicians learn to govern?*  
Answer: negative state (since there is sufficient indication that the speaker is frustrated)
- For Q2:
  - Text: *Sorry to see Mugabe kill so many civilians.*  
Answer: Mugabe
  - Text: *When will they stop killing babies in the womb?*  
Answer: 'they'
- For Q3:
  - Text: *Sorry to see Mugabe kill so many civilians.*  
Answer: negative (We can infer that the speaker has negative sentiment toward Mugabe.)
  - Text: *We need a diplomat like Kissinger*  
Answer: positive (We can infer that the speaker has a positive attitude towards Kissinger.)
- For Q4:
  - Text: *Hillary has to answer for Benghazi.*  
Answer: mixed (opposing sides) (The speaker is expressing negative sentiment towards Hillary, but there are many who view Hillary favorably.)
  - Text: *The war has displaced millions*  
Answer: negative (this event is predominantly negative)

# This Paper

- Outlined challenges for sentiment annotation.
- Proposed two annotation schemes that address these challenges:
  - a simple sentiment annotation questionnaire with more precise annotation directions and some additional label categories;
  - a semantic-role based questionnaire with additional questions to account for the speaker's emotional state and descriptions of valenced events.

*A Practical Guide to Sentiment Annotation: Challenges and Solutions*. Saif M. Mohammad, In *Proceedings of the NAACL 2016 Workshop on Computational Approaches to Subjectivity, Sentiment, and Social Media (WASSA)*, June 2014, San Diego, California.

<http://saifmohammad.com/WebPages/ResearchAreas.html>