

Information and Emotion in Online Health-Related Discussions: Visualizing Connections and Causal Chains

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Introduction

Coping with a health condition can be a difficult experience. Patients are likely to have numerous questions – what their illness is, how to deal with it, and so on. In recent years, people have increasingly sought out online support groups for the answers to these questions.

Affect is inextricably tied to the discussion content in online support groups:

- I'm so sick of people telling me... (**anger/frustration**)
- I'm so glad that it turned out to be nothing! (**joy**)
- I was diagnosed with cancer yesterday. I am scared, and I am worried about my kids... what will they do if...? (**fear/anxiety**)

Health-related discussion forums today do not readily support affect-based search. Thus, an interactive interface was designed in order to facilitate a view of the interrelatedness of topic and emotion in health-related discussion forums. The current version uses a corpus of discussion content that was aggregated through focused crawls of a large health-related social networking site, DailyStrength (<http://www.dailystrength.org>).

System Design

- The discussion content and associated metadata are stored in a MySQL database.
- Predictions of affective content are generated using a keyword-based extraction system based on Wordnet-Affect.
- Topic identification using the MALLET toolkit.
- Charts are generated with the aid of the pChart library, ver.1.27d (<http://pchart.sourceforge.net>).

References

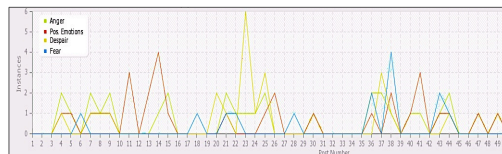
McCallum, Andrew Kachites. "MALLET: A Machine Learning for Language Toolkit." <http://mallet.cs.umass.edu>, 2002.
C. Strapparava and A. Valitutti. *Wordnet-affect: an affective extension of wordnet*. In Proceedings of the 4th International Conference on Language Resources and Evaluation, Lisbon, 2004.

System Features

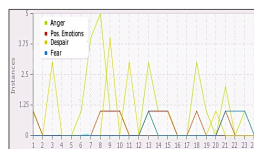
- Affect-based search
- Affective timelines
- Summary views by topic

How are different emotions expressed in the same thread?

Thread with a variety of emotions interspersed:

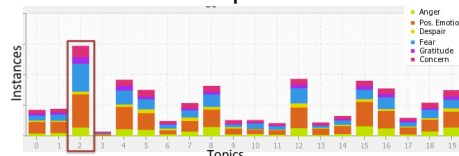


Predominantly anger and despair:



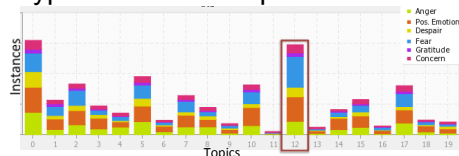
How are topic and emotion related?

Breast Cancer Topics



Topic 2, on test results, is comprised of more fear and positive emotion.

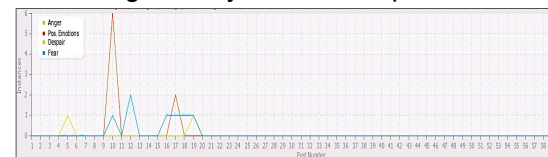
Type 1 Diabetes Topics



Topic 12 (complications) is comprised of a greater proportion of fear.

What emotions are associated with a given topic?

Switching from Lyrica to Gabapentin*



Mainly about dosages – thus, less affective content.

Lyrica Relief



A variety of emotions.

Starting Cymbalta



Despair and fear throughout the lifetime of the thread.

*These visualizations were generated based on just a few threads concerning these medications, and are not meant to be representative of all discussion content on these medications.

Conclusion

This tool could be useful in a variety of contexts.

- **Patients:** identify posts that resonate with their own thoughts and feelings, or provide alternative views to a topic that they are struggling with.
- **Forum moderators:** identify patterns of affective content and implement features to facilitate empathic communication.
- **Researchers:** analyze the role of affect in health information interactions.

