The expression of sentiment in user reviews of hotels

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The linguistic expression of sentiment, understood as the polarity of an opinion, is known to be domain-specific to a certain extent (Aue & Gamon, 2005; Choi et al., 2009). Even though many words and expressions convey the same evaluation across domains (e.g., "excellent", "terrible"), many others acquire a more precise semantic orientation within a specific domain. For example, features such as size or location (and the lexical expressions that are used to express them) may or may not convey semantic orientation depending on the topic. In Sentiment Analysis (SA), it is critical that domain-specific expressions of sentiment be accounted for (Tan et al., 2007) if the system is to be useful to those who wish to explore the polarity of texts belonging in that domain.

The software tool Lingmotif (Moreno-Ortiz, 2016) will be used to explore a corpus of hotel reviews in the English language. Lingmotif is a lexicon-based, linguistically-motivated, user-friendly, GUI-enabled, multi-platform, Sentiment Analysis desktop application. Lingmotif can perform SA on any type of input texts, regardless of size and topic. The analysis is based on the identification of sentiment-laden words and phrases contained in the application's rich core lexicons, and employs context rules to account for sentiment shifters. It offers easy-to-interpret visual representations of quantitative data (text polarity, sentiment intensity, sentiment profile), as well as a detailed, qualitative analysis of the text in terms of its sentiment. Lingmotif can also take user-provided plugin lexicons in order to account for domain-specific sentiment expression.

In this paper, we describe our procedure to identify domain-specific lexical cues for the domain of user reviews of Spanish hotels. We made use of a recently compiled corpus of reviews from the online travel agency *booking* site booking.com. This corpus was analyzed entirely with Lingmotif using only its core (i.e., general-language lexicon), and then manually analyzed the results to find errors and omissions produced by the lack of specialized language cues. We then encoded the identified lexical cues as a Lingmotif plugin lexicon and reran the analysis with it. This methodology allowed us, first, to obtain a very concrete description of the expression of sentiment in this domain, and, from a practical perspective, to precisely measure to what extent this expression is domain-dependent.

Aue, Anthony, and Michael Gamon. 2005. "Customizing Sentiment Classifiers to New Domains: A Case Study." *Recent Advances in Natural Language Processing (RANLP)*. Borovets, Bulgaria.

Choi, Yoonjung, Youngho Kim, and Sung-Hyon Myaeng. 2009. "Domain-Specific Sentiment Analysis Using Contextual Feature Generation." In *Proceeding of the 1st International CIKM Workshop on Topic-Sentiment Analysis for Mass Opinion*, 37–44. Hong Kong, China: ACM.

Moreno-Ortiz, Antonio. 2016. *Lingmotif* (version 1.0). Málags. Spain: Universidad de Málaga. http://tecnolengua.uma.es/lingmotif.

Tan, Songbo, Gaowei Wu, Huifeng Tang, and Xueqi Cheng. 2007. "A Novel Scheme for Domain-Transfer Problem in the Context of Sentiment Analysis." In

Corpus Info:

Composed of all positive and negative reviews of 100 hotels in the Spanish south coast (Malaga, Granada, Almería, Cádiz).

Pos/Neg reviews were grouped for each hotel: 200 files.

Polarity	Tokens	Types	T/T Ratio
Negative	140354	7323	5.21752141
Positive	147530	6103	4.136785738

Lingmotif Lexical Data:
Lingmotif English Core Lexicon v. 1.1 (April 2017): 72,000 entries
Lingmotif English Context Rules v. 1.1 (April 2017): 700 entries

Main results:
- The higher T/T ratio in negative reviews (unjustified by the negligible difference in size) may be an indicator that more elaborate language is used to criticize than to praise.
- 100% are classified correctly. This probably wouldn't be the case if reviews had been analyzed individually, but there wouldn't have been many misclassified cases.
- Positive reviews are VERY CLEARLY positive, whereas negative ones are not so clear-cut (positive bias).

Domain-specific issues:
- Size
- Price
- Variety and size of food
- Views
- Location
- Kindness of staff
- Presence of facilities: "no gym", "no terrace", "just a coffee machine in the lobby", "shower did not seem to have a thermostat", "no kettle in the room", "no English channels on the tv"
- "oldness" of facilities: "A/C was really old"
- Deliverance on promise (deceitful advertising)
- Specific lexical items: "You would imagine a Double Superior (+3) Room would provide…", "minibar was not restocked"
-

Lingmotif problems

- Wrong POS tagging: The safe (+2) in the room was broken.
- Comparisons: "you will have a better choice somewhere else"
- Unaccounted context rules: our concerns (-2) about the cleanliness (+2).
  "everything refreshed (+2) as_soon_as they ran_out_of (-3) something.
- Evaluating things other than the hotel: "I messed_up (-3) by booking the wrong (-3) month"