The Role of Emotions for the Perceived Usefulness in Online Customer Reviews

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Abstract

Online customer reviews often express emotions. This can enable marketers to analyze the textual content of online reviews with the aim to understand the role of emotions and how they can affect other customers. In this paper, we present an approach to extracting emotion content from online reviews in order to measure the importance of various emotion dimensions within different product categories. The approach uses an emotion lexicon to extract emotion terms, while it also builds a classification model to measure the importance of emotion dimensions based on the quality of reviews. Review quality is measured based on the usefulness of online customer reviews, which are perceived and evaluated by other customers through their helpfulness ratings. This approach allows the identification of emotion dimensions that characterize qualitative reviews. The empirical evaluation in our study suggests that trust, joy, and anticipation are the most decisive emotion dimensions, although substantial variance across product categories can also be detected. Additionally, we compared two contrasting emotion dictionaries. One lexicon was crowd-funded and contained a large vocabulary, whereas the other was more focused and smaller, since it was created word-wise by an expert. Our empirical findings indicate that the crowd-funded solution outperforms its smaller counterpart in terms of classification precision. The main implication of this study is that it adds an emotional perspective to the broad set of existing tools that marketers employ to analyzing online reviews. Our contributions are: i) we are the first to analyze emotions' role in online customer reviews; ii) we demonstrate how to develop a big data model such as this, without external assistance; iii) we show how to interpret the results of the created model; and iv) we show which dictionary to prefer when creating the model.
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Introduction

Online customer reviews have become an important means for both companies and customers to receive and provide feedback concerning products and services. Marketers use online customer reviews as a driving factor for companies' sales (Chevalier and Mayzlin 2006), and also to evaluate brand perception and the actual satisfaction level of their customers (Anderson 1998), while customers use reviews for reasons such as opinion leading, the sharing of expertise, or simply originality (Arndt 1967; Chen, Fay, and Wang 2011).

The expansive character of online customer reviews under-

scores the necessity for marketers to develop the expertise to cope with big data. Such applied knowledge helps marketers to address open research questions such as "how do consumers process the textual content in electronic word-of-mouth (eWOM) messages" (King, Racherla, and Bush 2014).

Following the stream of big data driven marketing, we study the role of emotion content in eWOM by using data mining, while we also try to shed light on the motivating research questions, such as the ones described below.

Motivation

Sentiment "reflects the deeper psychological state of the holder" (Hovy 2015), and its importance in marketing has already been acknowledged in the literature (Bagozzi, Gopinath, and

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Nyer 1999). Even so, new challenges and opportunities have arisen for research and managers alike, for example, the need to analyze large volumes of consumer generated text, such as online reviews. While traditional research mostly uses surveys and self-reports to measure the emotions of only a few test candidates (Bagozzi, Gopinath, and Nyer 1999), marketers today can use masses of customer data to gain valuable insights.

Related research has already examined sentiment classification (Blitzer, Dredze, and Pereira 2007) and the prediction of review helpfulness (Ghose and Ipeirotis 2011); however, our approach is driven by different research questions:

- How do emotions affect the quality of reviews, when the quality of reviews is expressed by the helpfulness ratings of other customers?
- Which emotion dimensions drive the perceived usefulness of online customer reviews?
- Does the perceived usefulness per product category change, when different emotion dimensions are involved?

Our results complement the existing research (see the Background and Related Work section) by providing marketers with a methodology, that identifies the role of emotions in customer feedback and also shows how other customers are affected by reading these online reviews (Bagozzi, Gopinath, and Nyer 1999).

Contribution and Outline

Our study makes the following contributions:

- To the best of our knowledge, we are the first to analyze the role of emotions in online customer reviews.
- We provide marketers and managers with transparent guidelines in order to create a model for an emotion-analysis on their own big data.
- Motivating discussions, based on our results, encourage marketers to screen their reviews accordingly to obtain their own managerial implications.
- We compare two opposing dictionaries to contrast the "crowds" versus "experts" approach.
- Finally, we show which of the features that characterize emotions in online customer reviews can be seamlessly combined with other standard features that have been used in related research, to facilitate the task of predicting review helpfulness.

For various product segments, our study investigates the impact of different categories of human feelings (e.g., trust, fear), which we call 'emotion dimensions', and are proven by psychological research. We developed a methodology to analyze a large number of online customer reviews using an emotion lexicon, whereby each entry is subdivided into eight different emotional dimensions. Text mining techniques are applied to perform data-processing, and classification methodology is used for the calculation and verification of our results.

A second goal of our study was to compare two contrasting types of available emotion dictionaries. One lexicon has been made possible through crowdfunding with the aim to be broad and to cover a large vocabulary set. The other lexicon, which has been used in related research (see the Related Work to Review Quality, Helpfulness-ratings and Emotion Features section), is more focused, and for this reason it is smaller, since it was created with a specific focus on words by a single expert. Our study compares these two dictionaries, and our results indicate that the crowd-funded solution outperforms its smaller counterpart in terms of classification precision.

Our methodology can be used to add further knowledge to existing marketing applications about customers, products, services, and market reputation, such as Customer Relationship Management (CRM).

The remainder of this article is structured as follows:

The Background and Related Work section provides insight into some of the emotion theories of the psychology domain. It also introduces existing work and emotion dictionaries.
The Proposed Method section deals with the technical background by introducing the classification algorithm that we used in our approach. This includes the formulation of a classification problem, which combines feature vectors based on emotion dimensions with target functions that are designed to predict review helpfulness.
The Empirical Evaluation section starts with a description of the real dataset that we use in our empirical evaluation. Furthermore, a presentation and discussion of results is provided, in which we explore the role of emotions in online customer reviews in terms of their helpfulness-scores. In line with the presented results, we compare two distinct emotion lexicons to facilitate the search for an appropriate dictionary. The discussion of results finalizes this section, and thus emphasizes the importance of our methodologies and results.

We close our work with main conclusions and derive future research questions from our limitations in the Conclusions section.

Background and Related Work

This section provides the reader with the necessary definitions and basics. In the Background of Emotion Lexicons section we briefly introduce marketers into a selection of emotions' concepts from the psychology domain and link this knowledge to existing emotion dictionaries as a means to analyze texts according to their emotional content. In the Related Work to Review Quality, Helpfulness-ratings and Emotion Features section we embed our analysis into related research. We conclude this section with a general discussion about available emotion lexicons and explain the reasons why we chose the dictionaries for our study.

Background of Emotion Lexicons

Emotions represent "our subjective feelings and thoughts" (Liu 2012) which "arise in response to appraisals one makes for something of relevance to one's well-being" (Bagozzi, Gopinath,