Linguistic Understanding of Complaints and Praises in User Reviews

Kavita Ganesan & Guangyu Zhou
kavitaganesan@github.com, gzhou6@illinois.edu

Introduction & Goals
• Traditional sentiment analysis does not account for informativeness of opinion texts.
• For many real-world applications such as social listening, brand monitoring and e-commerce platforms, the opinions that really matter are opinions describing why something is good or bad.
• Our goal: Understand linguistic properties of complaints and praises - an informative subset of the negative and positive categories.
  - Study performed in the context of user reviews
  - We investigate several properties: (1) length property, (2) noun and adjective usage, (3) past tense usage (4) negation usage; (5) intensifier usage and (6) causal links.
  - We contrast the properties of complaint and praise sentences with negative only or positive only sentences.

Methods
• We defined 4 main categories:
  - NegativeOnly – Negative sentence but not a complaint
    Example: “This is not a good company, stay away!”
  - Complaint – Describes why something is bad
    Example: “This company takes your payment but on the day of the scheduled job, they don’t appear”
  - PositiveOnly – Positive sentence without much information
    Example: “I really love that restaurant, its awesome”
  - Praise – Describes why something is good
    Example: “This restaurant has delicious tacos and the ambiance is amazing”
• For each category: manually gathered 500 review sentences from various review sources.
• Analyzed various properties of the sentences in each category

Results

Sentence Length Analysis
• Average # words in praise sentences: 15.54
• Average # words in complaint sentences: 15.75
• Average # words in positive only sentences: 10.33
• Average # words in negative only sentences: 10.25
• Bottom line: praise sentences and complaints more verbose than positive only or negative only sentences.

Noun and Adjective Usage

<table>
<thead>
<tr>
<th>Nouns</th>
<th>Avg. Per Sentence</th>
<th>Adjective</th>
<th>Avg. Per Sentences</th>
</tr>
</thead>
<tbody>
<tr>
<td>NegativeOnly</td>
<td>1.87</td>
<td>NegativeOnly</td>
<td>0.972</td>
</tr>
<tr>
<td>Complaint</td>
<td>3.36</td>
<td>Complaint</td>
<td>1.500</td>
</tr>
<tr>
<td>PositiveOnly</td>
<td>2.16</td>
<td>PositiveOnly</td>
<td>1.164</td>
</tr>
<tr>
<td>Praise</td>
<td>3.56</td>
<td>Praise</td>
<td>2.086</td>
</tr>
</tbody>
</table>

Bottom line for nouns:
• NegativeOnly and PositiveOnly categories – 1 noun per sentence
• Complaint and Praise categories – 3 nouns or more per sentence.

Bottom line for adjectives:
• Most praise sentences use 2 or more adjectives; most complaint sentences use a single adjective
• Reason: In a praise sentence, user’s tend to compliment more than one aspect of a topic within a single sentence.
  Example: “This is a really lightweight machine and it is easy to assemble.”
• Reason2: With complaints, users tend to elaborate why a single aspect of a topic is bad.
  Example: “This machine was really hard to put together, the screws don’t fit so I sent it back.”

Past Tense Analysis

<table>
<thead>
<tr>
<th>Avg. Past Tense per Sentence</th>
<th>NegativeOnly</th>
<th>Complaint</th>
<th>PositiveOnly</th>
<th>Praise</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.63</td>
<td>1.26</td>
<td>0.55</td>
<td>0.68</td>
<td></td>
</tr>
</tbody>
</table>

Bottom line:
• On average, every complaint sentence uses at least 1 past tense.
• Reason: Within a complaint, a user is often explaining away why something was bad and what their actions were in response to the situation, which is usually something in the past.

Intensifier Usage

<table>
<thead>
<tr>
<th>% Sentences containing intensifiers</th>
<th>NegativeOnly</th>
<th>Complaint</th>
<th>PositiveOnly</th>
<th>Praise</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.40%</td>
<td>16.80%</td>
<td>14.80%</td>
<td>20.60%</td>
<td></td>
</tr>
</tbody>
</table>

Bottom line:
• Intensifiers are mostly used in praise sentences
• Reason1: Praise sentences tend to couple multiple positive aspects into a single sentence
  Example: “This is a really light phone and super easy to use!”
• Reason2: Users tend to over emphasize positive points and state negative points more in a matter of fact fashion

Causal Transitions (because, since, as, therefore...)

<table>
<thead>
<tr>
<th>% Sentences containing causal transitions</th>
<th>NegativeOnly</th>
<th>Complaint</th>
<th>PositiveOnly</th>
<th>Praise</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.40%</td>
<td>28.20%</td>
<td>16.60%</td>
<td>23.80%</td>
<td></td>
</tr>
</tbody>
</table>

Bottom line:
• There is a much stronger relationship between causal transitions and the complaints category
• Reason: Complaints tend to have more explicit description on what caused something to be bad or reaction in response to something negative.