Product versus non-product oriented social media platforms: online consumer opinion composition and evolution

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Social Media Research

- Past research: Significant impact of online comments on purchase behavior (e.g. Zhang and Dellarocas 2006)
- Unanswered questions:
  - Who makes the comments?
  - How do the online comments evolve over time?
How this study is different

- Prior research has examined (in a single site):
  - Temporal dynamics of online ratings (Godes and Silva 2012)
  - Likelihood of consumers posting online and over time (Moe and Schweidel 2011)
- Go beyond a single type of social media to examine how posted comments may be different
How this study is different (cont’)

- Social media platforms serve different purposes, implying that user behaviours probably differ across outlets
  - Post or read product evaluations -> discussion boards and forums
  - Daily routines or conversations with friends -> social networking sites

=> Social media platforms will host a disproportionate share of opinions of certain types of consumers, making social media opinions deviate from general consumer attitudes
How posting behaviours vary across platforms

- General question: How social media opinions are related to but different from actual consumer attitudes
- RQ1: Opinion composition
  - How the composition of consumers who posting comments varies across platforms
- RQ2: Opinion evolvement
  - To what extent is there opinion convergence over time?
Comparing between social media platforms

- Product versus non-product oriented social media platforms
  - Key difference between the two is the salience of contextual cues reminding users that the platform is dedicated to discussions relating to a specific product or service
  - Different norms in both platforms

- Examples of product oriented social media platforms: Eopinions.com, Ecomplaints.com and Tripadvisor.com

- Examples of non-product oriented social media platforms: Twitter, Plurk, Facebook
Lit review: Opinion Composition

- Who expresses their opinions online?
- Satisfied customers?
  - Concerns for other people’s needs and welfare
  - Excitement in the experience with the product or service
  - Desire to improve image
  - Wish to help the company
- Or dissatisfied consumers?
  - Wish to reduce anxiety and frustration
  - Give a friendly warning to other consumers
  - Gain sympathy from others
  - Take revenge
Opinion Composition across Platforms

- Extremely satisfied and extremely dissatisfied consumers have strong motivations to share their opinions (Anderson 1998)
- Product oriented social media platforms are perceived as forums for discussions of products
- Moderately satisfied consumers are more likely to share their views on products in non-product oriented outlets
Opinion composition across platforms

- Hypothesis 1a: the proportion of extremely positive comments is larger in product oriented social media platforms than non-product oriented social media platforms.

- Hypothesis 1b: the proportion of extremely negative comments is larger in product oriented social media platforms than non-product oriented social media platforms.
Opinion evolution: why posts are distorted?

- Early reviews influence later comments, thus resulting in a sequential pattern (Moe and Schweidel 2011)
- Trends of posted opinions have a path dependent feature
- Prior research is silent on whether and how social media platforms affect the evolution of online opinions
- People convey messages that do not truly reflect their beliefs, attitudes or values in order to manage the impressions or achieve interpersonal goals
- Previous studies show consumers revise their posts because of contextual cues that prompt them to think about enhancing their images
Opinion evolution across platforms

- Anchoring effect
  - Cognitive bias that people’s assessment shows influence from an implicit reference point (Tversky and Kahneman 1974)
  - Posters involuntarily incorporate influence from existing posts, unconsciously synthesize opinions expressed in current posts
- Anchoring in product social media platforms
  - Reference points are readily available and accessible
  - Consumers are likely to read existing comments, which triggers the anchoring effect
Opinion evolution across platforms

- Anchoring in non-product social media platforms
  - Limited availability and accessibility to product related opinions.
  - Comments can only exert a limited impact, because it would probably vanish quickly as a result of the overwhelming amount of new posts irrelevant to the product.
  - Comparatively fewer social consequences

- Hypothesis 2: The variance in the valence of new comments posted on product oriented social media platforms decreases faster over time than that posted on non-product oriented social media platforms.
Research methodology

• Data collection
  • Daily social media comments on major cinematic movies (total: 239) released in the US market from Oct 2010 to Oct 2011
  • Product oriented social media comments from online forums and discussion boards
  • Non-product oriented social media comments from Twitter, Plurk and Facebook
Key Measures

- **Measurement**
  - **Valence**
    - We use a text analysis tool (Chang and Lin 2011) to measure the comment sentiment
  - Robust check:
    - High inter-rater (computerized classification) reliability of 0.822 and 0.926 for product and non-product oriented social media comments respectively
- **Volume**: the number of comments concerning a particular movie
Dependent Variables

• Extreme comments:
  • Pool together all comments from product and non-product oriented social media platforms accumulated across time
  • Rank them in ascending order of their sentiment scores
  • Sentiment score at the positions of 10% and 90% are marked as the cutoff value
  • For each day, calculate the proportion of extremely positive opinions appearing for product and non-product oriented social media platforms respectively
Dependent Variables

- (H1a): proportion of extremely positive opinions
  - Proportion of comments whose sentiment score falls above the 90th percentile of all comments
- (H1b): proportion of extremely negative opinions
  - Proportion of comments whose sentiment score falls below the 10th percentile of all comments
- (H2): Daily standard deviation of comment valence within product or non-product oriented social media platforms
Table 1. Random effects estimation (H1a and H1b)

<table>
<thead>
<tr>
<th></th>
<th>Extr_negative</th>
<th></th>
<th>Extr_positive</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Std. Err.</td>
<td>Coefficient</td>
<td>Std. Err.</td>
</tr>
<tr>
<td>PO Dummy (product oriented; 1)</td>
<td>0.066***</td>
<td>0.003</td>
<td>0.164***</td>
<td>0.002</td>
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<tr>
<td>(N)PO valence</td>
<td>-0.453***</td>
<td>0.013</td>
<td>0.248***</td>
<td>0.010</td>
</tr>
<tr>
<td>(N)PO volume</td>
<td>0.001</td>
<td>0.001</td>
<td>0.002***</td>
<td>0.001</td>
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<tr>
<td>Weeks</td>
<td>10^{-10}</td>
<td>10^{-10}</td>
<td>10^{-10}</td>
<td>10^{-10}</td>
</tr>
<tr>
<td>Budget</td>
<td>-0.007*</td>
<td>0.003</td>
<td>10^{-10}</td>
<td>0.003</td>
</tr>
<tr>
<td>Rank1</td>
<td>-0.004</td>
<td>0.002</td>
<td>0.001</td>
<td>0.002</td>
</tr>
<tr>
<td>Rank2</td>
<td>-0.001</td>
<td>0.002</td>
<td>10^{-10}</td>
<td>0.002</td>
</tr>
<tr>
<td>MPAA-PG</td>
<td>-0.001</td>
<td>0.012</td>
<td>-0.005</td>
<td>0.010</td>
</tr>
<tr>
<td>MPAA-R</td>
<td>-0.012</td>
<td>0.007</td>
<td>0.005</td>
<td>0.007</td>
</tr>
<tr>
<td>Drama</td>
<td>-0.010*</td>
<td>0.007</td>
<td>0.002</td>
<td>0.008</td>
</tr>
<tr>
<td>Thriller</td>
<td>-0.002</td>
<td>0.008</td>
<td>-0.010</td>
<td>0.008</td>
</tr>
<tr>
<td>Comedy</td>
<td>-0.006</td>
<td>0.008</td>
<td>-0.014</td>
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<tr>
<td>Intercept</td>
<td>0.566***</td>
<td>0.064</td>
<td>-0.160**</td>
<td>0.060</td>
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<tr>
<td>$R^2$</td>
<td>0.2135</td>
<td>0.2914</td>
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</table>

Note: *** represents $p$-value $<0.001$; ** represents $p$-value $<0.01$; * represents $p$-value $<0.05$. All $R^2$ statistics are significant at the $p$-value $<0.001$. 
Table 2. Random effects estimation
(H2) DV = SD of Valence

<table>
<thead>
<tr>
<th></th>
<th>Null Model Coefficient</th>
<th>Std. Err.</th>
<th>Full Model Coefficient</th>
<th>Std. Err.</th>
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</thead>
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<td>Weeks</td>
<td>1.0*10</td>
<td>1.0*10</td>
<td>1.0<em>10</em>10</td>
<td>1.0<em>10</em>10</td>
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<tr>
<td>PO_Dummy</td>
<td>0.044***</td>
<td>0.002</td>
<td>0.069***</td>
<td>0.004</td>
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<tr>
<td>(product oriented)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trend</td>
<td>-0.007*</td>
<td>0.003</td>
<td>-0.002</td>
<td>0.003</td>
</tr>
<tr>
<td>PO_Dummy*Weeks</td>
<td></td>
<td></td>
<td>-0.003***</td>
<td>1.0*10</td>
</tr>
<tr>
<td>PO Dummy*Trend</td>
<td></td>
<td></td>
<td>-0.028**</td>
<td>0.008</td>
</tr>
<tr>
<td>(N)PO_valence</td>
<td>-0.135***</td>
<td>0.009</td>
<td>-0.135***</td>
<td>0.009</td>
</tr>
<tr>
<td>(N)PO_volume</td>
<td>0.023***</td>
<td>0.001</td>
<td>0.022***</td>
<td>0.001</td>
</tr>
<tr>
<td>Budget</td>
<td>0.004</td>
<td>0.002</td>
<td>0.004</td>
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<tr>
<td>Drama</td>
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<td>0.005</td>
<td>-0.002</td>
<td>0.005</td>
</tr>
<tr>
<td>Thriller</td>
<td>0.021***</td>
<td>0.005</td>
<td>0.022***</td>
<td>0.005</td>
</tr>
<tr>
<td>Comedy</td>
<td>0.004</td>
<td>0.005</td>
<td>0.004</td>
<td>0.005</td>
</tr>
<tr>
<td>Intercept</td>
<td>0.128**</td>
<td>0.044</td>
<td>0.124**</td>
<td>0.044</td>
</tr>
</tbody>
</table>

Note: *** represents p-value<0.001; ** represents p-value<0.01; * represents p-value<0.05. All F-statistics are significant at the p-value<0.001.
Figure 1a. Social media platform differences in daily standard deviation of comment valence
Figure 1b. Social media platform differences in daily standard deviation of comment valence
Findings

- H1a supported
  - The proportion of positive comments is higher ($\beta = 0.164$, p-value < 0.001) for product oriented social media platforms

- H1b supported
  - There are more negative posts ($\beta = 0.066$, p-value < 0.001) in product oriented social media platforms

- H2 supported
  - Standard deviation of comment valence deceases at a faster pace in product oriented social media platforms ($\beta = -0.003$, p-value < 0.001)
Discussion and conclusion

- Posting population is different across outlets
  - There are more extremely positive and negative posts in product oriented social media platforms
  - Satisfied and dissatisfied consumers intend to create an impact on other consumers, and they prefer product oriented social media platforms

- Tension between opinion diversity and opinion convergence
  - Opinions in product oriented social media platforms are more diverse
  - Greater opinion convergence for product oriented social media platforms
Research Implications

- There is a need to extend our knowledge of online opinion formation, which help us draw reasonable inferences from social media comments.
- Scant attention is devoted to investigate the dynamics of product related online chatter (Kapoor and Piramuthu 2009).
- Our research examines the moderator effect of platform difference, which is one primary factor determining the context, but neglected in most of previous social media research.
  - Product oriented social media platforms are found to have a larger proportion of polarized opinions.
  - Anchoring effect is more pronounced in product oriented platforms.
Implications for Practice

• Increase in similarity in social media comments might be interpreted as a signal that consumers reach a consensus over the product, provoking strategic response from marketers
• Changes in comment sentiment might be a reflection of or reaction to posted opinions
• Social media platforms are not direct counterparts of each other
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