Cultural Dimensions in Twitter: Time, Individualism and Power

Ruth García-Gavilanes (UPF - Barcelona)
Daniele Quercia (Yahoo! Barcelona)
Alejandro Jaimes (Yahoo! Barcelona)
Culture
Microblogs
WHAT IS CULTURE?
Culture is a dimension that distinguishes members of one group or category of people from others.
HOW TO MEASURE CULTURE

• Geert Hofstede: Cultural dimensions
  Individualism
  Power Distance

• Levine: Pace of Life (Geography of time)
  • Perception of time

• Edward T. Hall
  Monochronic vs Polychronic
Not considered

Pace of Life

Power Distance

Individualism

Levine

Hall
Culture and Social Media

Can such differences also be captured from online interactions?
How to measure culture online?

• **Pace of Life**
  Predictability (tweets, mentions)
  Tweets in working hours

• **Individualism vs. Collectivism**
  Users interacting with others (mentions)

• **Power Distance : Popularity**
  Follow, recommend and accept recommendation preferentially from more popular users (in-degree imbalance).
Sampling for 10 weeks in 2011

12.6K follows 1.9M

100 >= out-degree <= 1000

362K

#FollowFridday

2.34 geolocated users
Top 30 countries to study

The top 30 countries by # of users is representative of internet users

\[ r = 0.63^{***} \]
RESULTS
Pace of Life: Predictability

Entropy

\[ -\sum_{j=1}^{N_i} p_i(j) \log_2 p_i(j) \]

Interval j

12AM
6AM
9AM
6 PM
9PM
12PM

# tweets in working hours

Interval j

12AM
6AM
9AM
6 PM
9PM
12PM

Entropy

a) tweets  b) mentions

\[ p_i(j) : \]

# tweets in working hours
Pace of Life: Predictability

- The higher the pace of life, the more predictability.
- The higher the pace of life, the less fraction of users will tweet during working hours.

\[ p < 0.005 (***) , \quad p < 0.05 (**) , \quad \text{and} \quad p < 0.1 (*) \]

<table>
<thead>
<tr>
<th></th>
<th>Tweets</th>
<th>Mentions</th>
<th>Users in working hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pace of life</td>
<td><strong>-0.62</strong></td>
<td><strong>-0.68</strong></td>
<td><strong>-0.58</strong></td>
</tr>
</tbody>
</table>
Individualism: Interacting with others

Collectivist countries interact more with others

\[ r = -0.55 \]

\( p < 0.005 (***) \), \( p < 0.05 (**) \), and \( p < 0.1 (*) \)
Individualism: Interacting with others

Hong et al. “Language matters in twitter: A large scale study” ICWSM 11
Collectivism
Interacting with others
Power Distance: popularity imbalance

Popularity imbalance for:

followees

accepted

recommended

seed

followees

#FollowFridday

follows
Users prefer to follow and recommend more popular users than themselves in countries with a higher power distance.
Power

Power Distance Index vs. In-degree Imbalance

Countries and their respective data points are plotted on the scatter diagram. The x-axis represents the Power Distance Index, while the y-axis shows the In-degree Imbalance. Key countries include Indonesia, Venezuela, Norway, Malaysia, Singapore, Chile, Mexico, Philippines, Colombia, United States, South Korea, India, Brazil, Canada, Argentina, Australia, Russia, Italy, New Zealand, Spain, Germany, Japan, France, South Africa, United Kingdom, Ireland, Turkey, Netherlands, Belgium, and Sweden.
27% of all blog trends are about artists and celebrities (Silang et al, 2011)
Why is this important?

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Pace of Time: Predictibility</th>
<th>Individualism: Mentions</th>
<th>Power Distance: Imbalance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mentions</td>
<td>Users (%)</td>
<td></td>
</tr>
<tr>
<td>GDP per capita</td>
<td>***0.55</td>
<td>**-0.57</td>
<td>**-0.41</td>
</tr>
<tr>
<td>Education</td>
<td>***0.58</td>
<td>**-0.51</td>
<td>-0.24</td>
</tr>
<tr>
<td>Inequality</td>
<td>***-0.53</td>
<td>**0.49</td>
<td>*0.39</td>
</tr>
</tbody>
</table>
What is next? More features

- Language dependent features
- More Cultural Dimensions
- Temporal comparisons
What is next?

- User recommender
  - Individualistic vs. collectivistic?
  - Predictable vs. unpredictable?

- Interfaces personalization
  - Do collectivist countries need additional features to interact easier?
  - More engagement?

- Information Propagation
  - By knowing the cultural characteristics of users, can we increase re-tweet chance?
Thank you
@ruthygarci