Emotion Expression and Contagion Online: Statuses, Sentiment, and Sympathy

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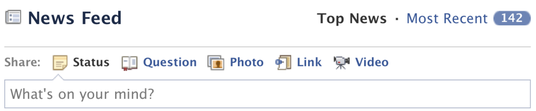
Research Questions

- **How can we model emotion expression online?**
- **How do these emotion expressions affect our friends?**
- **How contagious is "trivial" emotion expression?**

Introduction: Words Online

- The words we choose have a psychological meaning
  - They indicate **who** and **how** we are
- "Natural language," generated organically for the purpose of sharing with friends, offers a portal into how words are naturally used (Chung & Pennebaker, 2007)
- Many corpora are available online for researchers to examine
  - Prior work has focused on blogs (Chung et al., 2008; Kramer & Rodden, 2008; Kramer, 2009), Facebook status updates (Kramer, 2010), and forums (Ramirez-Esparza et al., 2008)
- These words are targeted via Social Networking sites
  - Facebook status updates are targeted to a specific set of viewers (e.g., friends)



  - Status Updates are short descriptions of how and what a person is doing, or a random thought they want to share with their friends--thus a **nearly ideal** form of self-expression!
- **Emotional content** of updates is psychologically meaningful and **word counting** can help us learn about expressed emotion (Kramer, 2010)

Introduction: Word Counting

- **Computers can read words far faster than humans**
- And sometimes they can "understand!"
- LIWC is a **computational** word-counting and -coding system, based on objectively-defined dictionaries classified into **psychologically relevant subtypes** (such as "positive emotion terms;" Pennebaker and colleagues, 2007)

Data Collection

- Group 1 (Users): ~1m randomly selected Facebook users who:
  - Chose to view the site in English
  - Posted one status update per day for three days
- Group 2 (Friends): All friends of Users who:
  - Chose to view the site in English
  - Posted at least one status update during the same three days
  - n ~ 150m
- Analysis repeated for three different three-day timeframes
- No status updates were read by researchers

Data Analysis

- First, count the number of positive and negative words used by Users and Friends on all three days

Fred Zeleny hates passive-aggressive Facebook updates, but loves irony.
3 hours ago • Like • Comment

  - Hate and aggressive are negative words, love is a positive word
  - This update does indeed seem mixed!
- Second, predict Friends' words on Day 3 from Users' words on all three days (controlling for Friends' words on the first two days)
  - Analyze word counts using Poisson regression (for count data, such as the count of negative and positive words)
- Third, use "bootstrapping" techniques to compare coefficients from this regression

Hypotheses

- **Users' positivity will predict greater positivity (and less negativity) for their Friends**
- **Friends' positivity and negativity on Day 3 will be predicted by Users' positivity and negativity on Day 1 (controlling for both groups' positivity on days 2 and 3)**
- **The effect will shrink over time (Users' words from Day 1 will be a smaller predictor than for Day 2/3)**

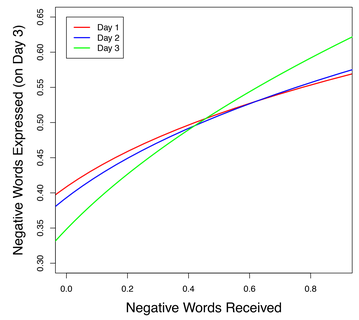
Results

- Hypotheses confirmed:
  - Poisson regression coefficients, predicting Friends' words on Day 3:

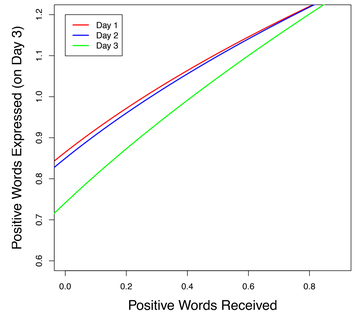
	Friends' Negative Words		Friends' Positive Words	
	Negative Words	Positive Words	Negative Words	Positive Words
Day 1	0.25	-0.02	-0.16	0.41
Day 2	0.29	0.02	-0.13	0.43
Day 3	0.44	-0.08	-0.21	0.58

  - Negativity by Users predicts greater negativity from Friends
  - Positivity by Users predicts greater positivity AND lesser negativity from Friends

Negative Emotion Contagion



Positive Emotion Contagion



  - Effects grow weaker over time (lines significantly different in slope)

Implications and Discussion

- **Emotion contagion is subtle:** Undirected posts vary in terms of emotion expression; friends' posts follow in kind
- **Effects are robust:** Shared experiences are controlled for!
- **Future direction:** Implicit expression / do unconnected causes of emotion (e.g., weather) also appear "contagious"?