

Do you feel what I feel?

Social Aspects of Emotions in Twitter Conversations

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Research Questions

- Do conversational partners influence each other's sentiment and emotion?
- What topics can affect conversational partner's sentiment?
- How can we find sentiments and emotions from text?

Our Work

- 1. Emotion discovery using a probabilistic topic model
- 2. Analysis of sentiment and emotion transition patterns
- 3. Identification of major topics that cause emotion influence

Contributions

- Interlocutors converge toward a common sentiment/emotion as conversation proceeds.
- Twitter users express lots of love and joy even when the partner expresses a negative emotion.
- Sympathy, apology, and complaining influence emotion.

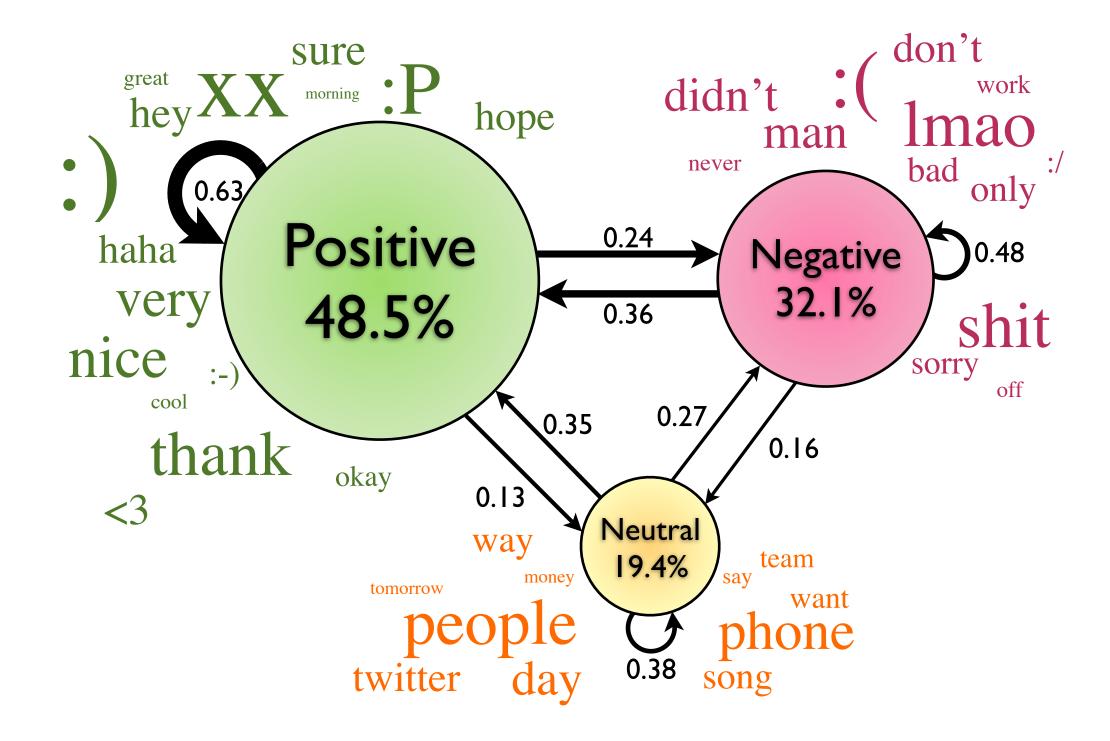
Conversation Data

We define consecutive replies of tweets using the reply button as a *chain*. Only chains of length >= 4 are considered.

#Users	#Dyads	#Chains	#Tweets	Tweets per chain
62,952	77,850	153,054	871,544	5.69

Social Aspects of Sentiments

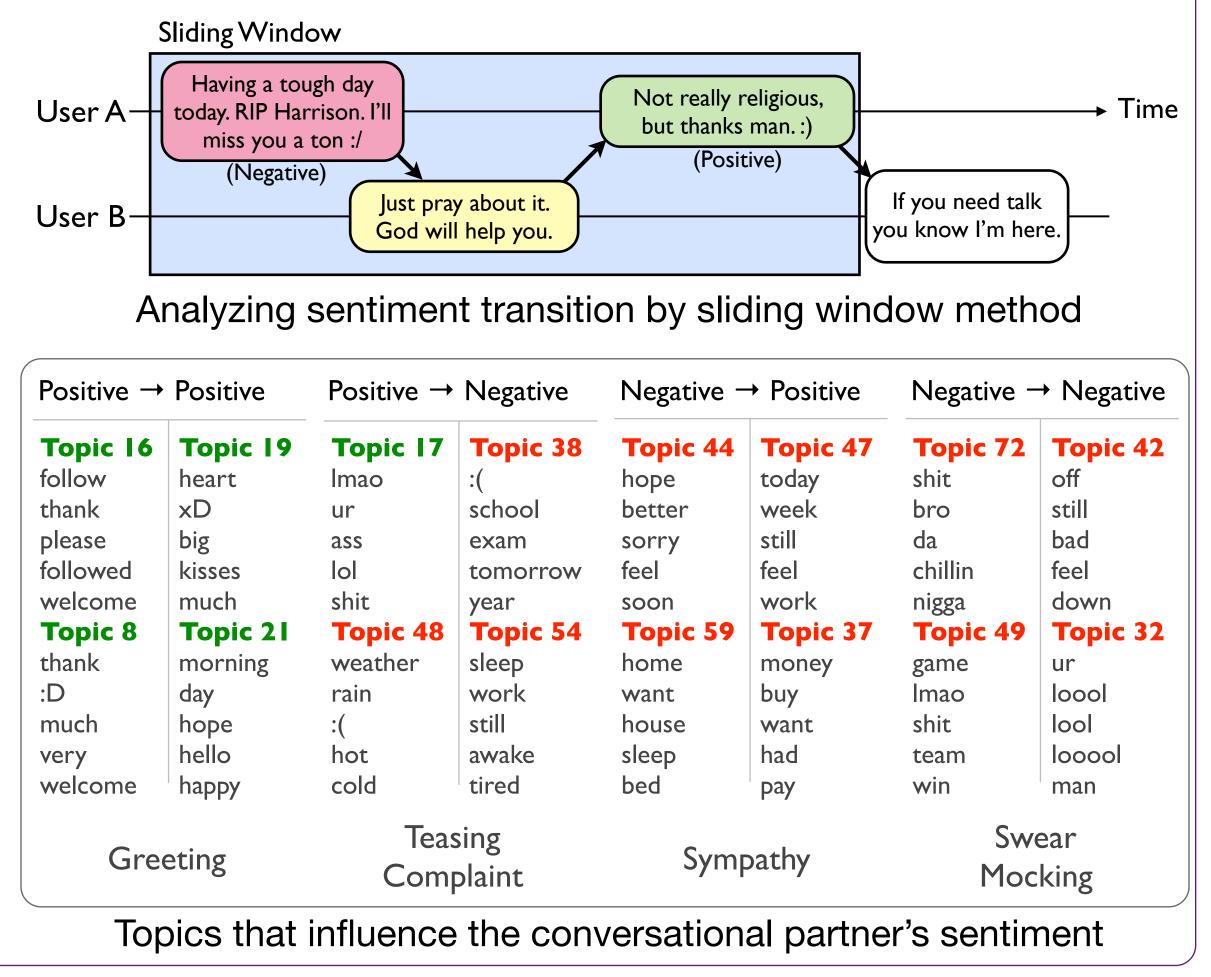
Q: How does the sentiment in a tweet lead to the sentiment in the reply? : Sentiment transition



Self-transitions make up the largest proportion. A: (1) Transitions to positive sentiments are high. (2)

Social Aspects of Emotions

Q: How does the sentiment and the topic of a tweet influence the partner's sentiment? : Sentiment influence



Q: How does the emotion in a tweet lead to the emotion in the reply? : *Emotion transition*

Finding emotions from tweets

Primary	Secondary & Tertiary
Love	Affection, Lust, Longing, Adoration, Fondness, Liking, Arousal, Desire, Infatuation, Longing,
Joy	Cheerfulness, Zest, Contentment, Pride, Optimism, Enthrallment, Relief Amusement,
Surprise	Surprise Amazement, Astonishment
Anger	Irritability, Exasperation, Rage, Disgust, Envy, Torment Aggravation, Agitation, Annoyance,
Sadness	Suffering, Sadness, Disappointment, Shame, Neglect, Sympathy Agony, Anguish,
Fear	Horror, Nervousness Alarm, Shock, Fear, Horror, Terror, Panic, Hysteria, Anxiety,

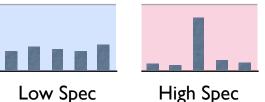
Parrott's tree-structured list of emotion

• Corr measures correlation between emotion c and topic t.

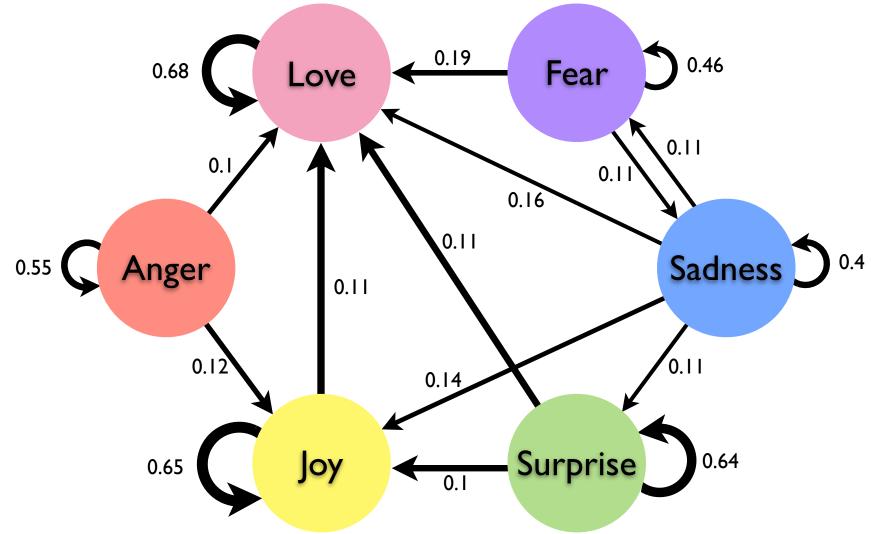
$$Corr(c,t) = \frac{\gamma_c}{n_c} \sum_{i=1}^{n_c} P(w_i | \phi_t)$$

• Spec measures specialization of certain emotion for topic t.

$$Spec(t) = \frac{\max_{c} Corr(c, t)}{\sum_{c} Corr(c, t) - \max_{c} Corr(c, t)}$$



Topics with high *Spec* score will be classified as emotion topics.



Q: How does the emotion and the topic of a tweet influence the partner's emotion? : *Emotion influence*

Anger	→ Joy	Sadnes	s → Joy	Surprise		
Topic 23	Topic 17	Topic 81	Topic 99	→Love	→Anger	
day	eat	better	hope	Topic 18	Topic 79	
night	food	feel	sorry	song	song	
party	cream	hope	better	album	shit	
home	make	pain	feel	amazing	new	
fun	chocolate	sick	soon	listening	Imao	
come	drink	:(hugs	great	never	

Anger		Love		Joy		Surprise		Sadness		Fear	
Topic 95	Topic 59	Topic I	Topic 3	Topic 3 I	Topic 40	Topic 18	Topic 30	Topic 99	Topic 86	Topic 60	Topic 87
eat	she	her	twitter	day	happy	song	where	hope	:(:/	dont
want):(smiles	justin	hope	birthday	album	live	sorry	miss	school	Imao
food	car	laughs	follow	morning	th	music	here	better	him	tomorrow	tell
chicken	were	eyes	selena	great	hahaha	new	same	feel	sorry	exam	want
hungry	off	want	fan	weekend	year	her	awesome	soon	want	year	him

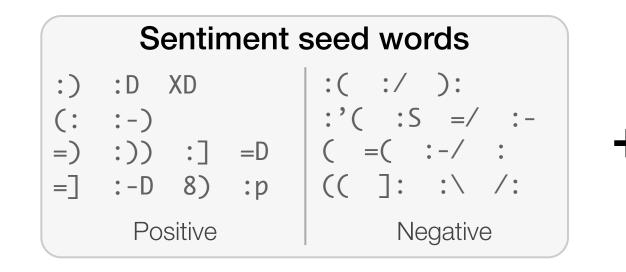
Topic 73	home	Topic 47	Topic 9	Topic 23	Topic 46	she	Topic 68	aww	sad	doing	her
she	her	school	pic	party	thank	amazing	she	okay	wish	much	please
hate	phone	luck	hair	home	much	listening	old	hugs	wanna	day	face
being	house	exam	look	fun	very	awesome	than	feeling	much	next	who
never	night	tomorrow	nice	tomorrow	hope	great	look	happened	cry	maths	omg
Emotion topics											

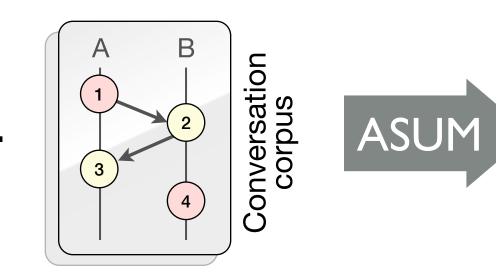
Sentiment Patterns in Conversations

 Interlocutors tend to converge toward a common sentiment as A: Sorry to hear about your bags. If you would like us to get someone to contact you DM us your reference and contact number. conversation proceeds. • What if two interlocutors have opposing sentiments? B: it's on it's way to manch. If the woman on the check in desk in Miami hadn't been trying to be all smart! Been no problem. $\underline{p_{u,v} - n_{u,v}}$ Overall sentiment of u in conversation v: Senti(u, v) =A: Sorry about that. Pleased to hear they located it quickly for you though. $p_{u,v} + n_{u,v}$ Emotions in sentiment-opposing conversations B: mistakes happen. Apology Complaint Agony - Sympathy Example of sentiment-opposing conversation Complaint - Apology

Finding Conversational Topics Using ASUM (LDA-based joint model of topics and sentiments)

ASUM automatically discovers topics for each sentiment.





Topics per				Sentiment-Topic	Sentiment-Topic
each sentiment				classification	distribution
song th album : music m new ve her w she T amazing m listening d awesome h	hank e D v nuch fo very c velcome h Fopic 2 I norning s lay h ope b	Fopic 95 eat want ood chicken hungry Fopic 73 she hate being hever	Topic 59 she :(car were off home her phone house night	Topic 8, Positive Thank you very much. :D Tweet	ABII