

MEASURES OF USER INTERACTIONS, CONVERSATIONS, AND ATTACKS IN A CROWDSOURCED PLATFORM OFFERING EMOTIONAL SUPPORT

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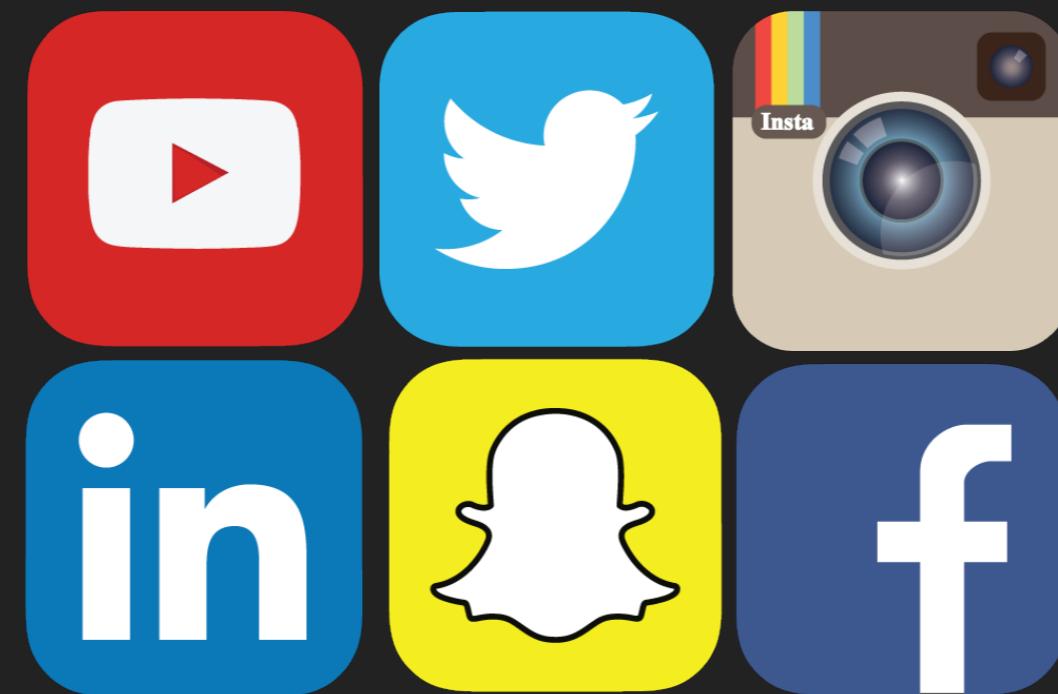
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ONLINE SOCIAL NETWORKS

- ▶ Internet and online based social media platforms are rising as the most dominant way people communicate and connect with each other. Facebook remains one of the most favored social media platform.
- ▶ Different types of social media platforms emerging, for instance
 - (i) instant messaging services like Snapchat, Kik etc.
 - (ii) mobile photo sharing, video sharing platform like Instagram,
 - (iii) business and employment oriented service like Linkedin etc.



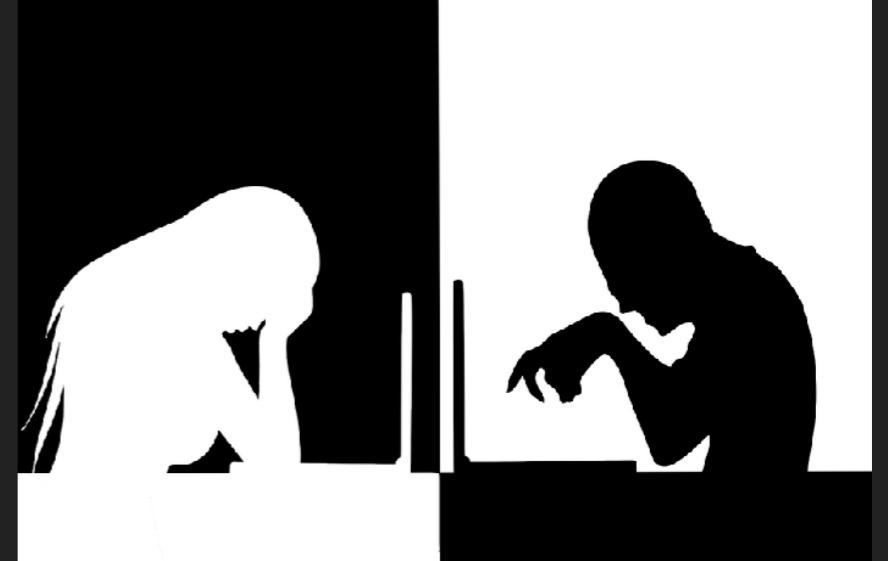
RISE OF ONLINE EMOTIONAL SUPPORT SERVICES

- ▶ The previously mentioned platforms are however not suitable for discussing emotional problems, because of their public or semi-public nature. Past studies also conclude that emotional problems such as anxiety and depression now are markedly higher than they were in earlier eras.
- ▶ This has therefore led to the rise of new type of social media services called online emotional support services.
- ▶ Examples of such services include Seven Cups of Tea, BlahTherapy, CrisisChat etc.



CYBERBULLYING ON THE RISE TOO ?

- ▶ Cyberbullying is one of the greatest problems born out of online social networks.
- ▶ Cyberbullying can be defined as the practice of sending an offensive, rude, or demeaning message to a user online with the intention of attacking them personally.
- ▶ Pew research survey from 2014 suggest widespread cyberbullying on internet and online social media.
Some key insights are :
 1. 73% of users observed other users being harassed.
 2. 40% experienced it themselves.
 3. 1/3rd of the surveyed witnessed sexual harassment or stalking.
 4. 1/4th of the surveyed were called offensive names.



RELATED RESEARCH

- ▶ Past studies have covered various aspects of online social networks such as :-
 1. Understanding structural properties of networks at a large scale to better understand such systems, thereby suggesting recommendations for improving such systems.
 2. Demonstrated advantages of using online social communities to share information about wide range of problems ranging from emotional to medical problems.
 3. Comparing structural properties of different online social networks such as Weibo and Twitter to study the differences and nuances of how the users use these online social systems.
- ▶ There has also been lot of work regarding the menace of cyberbullying on online systems, the adverse effects of cyberbullying on the victims and the challenges associated with it.

RELATED RESEARCH

- ▶ However, very little work has been done studying and exploring how the platforms providing online emotional support are utilized by its users, how the users behave on such systems and whether cyberbullying exist on such a system.
- ▶ This thesis tries to cohesively cover the previously mentioned aspects such as studying structural properties and characteristics of the online social networks, understanding user engagement, user behavior and finally understanding the problems and challenges of cyberbullying from the context of online emotional support service.

SEVEN CUPS OF TEA : OVERVIEW

- ▶ 7 Cups of Tea is an online service which provides free support to people experiencing emotional distress by connecting them with trained listeners.

- ▶ The listener, trained in active listening, interacts with the person seeking help via anonymous and confidential chat.
 - (i) Users can also participate on forums and group chats.
 - (ii) Lots of other resources available too.

- ▶ In recent years, 7cot has seen a remarkable growth in the context of number of registered active listeners and members on the website suggesting the need and popularity of such services



-- Forum Categories --



Popular

New

Top

Needs Reply

Want expert help?

Talk to a Therapist

New Posts

Problems being social with new people

Posted in Introduce Yourself to the Anxiety Support Community & Icebreakers!

Finding and Using Resources at 7cups/How do I request new counselor on 3day trial/Should i submit form to be unmuted?

Posted in Have A Question You Need Answered? Try our 7 Cups Community!

Welcome!

11 Forums

Forum	Threads	Posts	Last Post
Merchandise A place to discuss all things related to merchandise that we offer.	3	118	28 minutes ago by gongoozlersoup19
Information about using 7 Cups Please use these threads to get more acquainted with 7 Cups	15	21545	38 minutes ago by heartfulShoulder70
Community Guidelines and Protocol Please keep the following guidelines in mind as you contribute to the 7 Cups of Tea Forum.	28	1024	12 hours ago by decisiveFarm9808
7 Cups Podcast Check out old episodes of the 7 Cups Podcast here! :)	79	277	1 day ago by Anomalia

See All Forums

Forums on 7cot

Chat

[Join a Group Discussion!](#)

1-on-1

[Group Support](#)



Anxiety Support
Member Chat



Compassion Corner
Member Chat



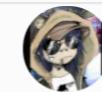
Depression Community Room
Member Chat



Want expert help?

[Talk to a Therapist](#)

Anxiety Support



I never had lessons



sensitivePineapple4357 (M) 7:13 PM • Wise One [Refer](#) [Mute/Report](#)



Ahh okay, sorry to hear



Shadowmagnet (M) 7:13 PM • Wise One [Refer](#) [Mute/Report](#)



mle neither



Ptolemy (M) 7:14 PM • Friendly Face [Refer](#) [Mute/Report](#)



I fell asleep during my test.



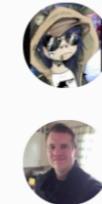
SnowOwl31 (M) 7:14 PM • Helping Hand [Refer](#) [Mute/Report](#)



Oops.



SnowOwl31 (M) 7:14 PM • Helping Hand [Refer](#) [Mute/Report](#)



shadow I found something funny out tho



sensitivePineapple4357 (M) 7:14 PM • Wise One [Refer](#) [Mute/Report](#)



Oh?



Shadowmagnet (M) • Wise One [Refer](#) [Mute/Report](#)

Please read the Chatroom Rules | 7 Currently Participating

Type your message here...



Group Chats on 7cot

Managing Finances Guide

Overview

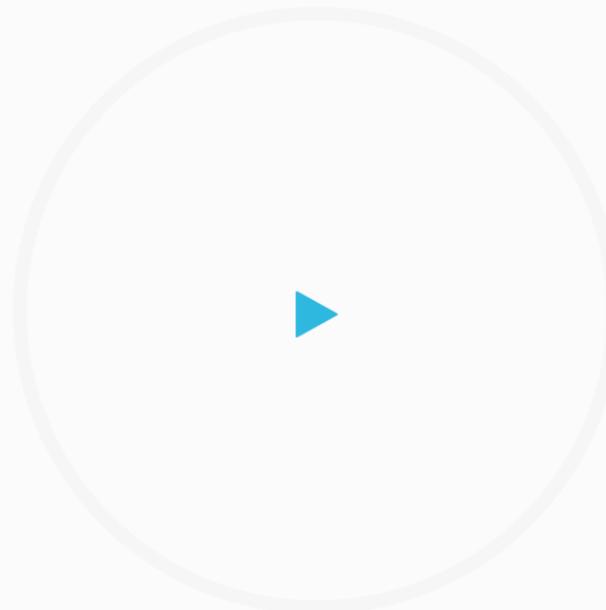
Do you ever find yourself feeling frustrated because of not having enough money to pay for things? Do you struggle to make ends meet and wish your money could stretch a little bit further? Or perhaps you're simply tired of feeling the pressure of your current financial situation and desire to be debt free. Managing finances can be difficult to say the least. This guide is designed to help you improve your current financial situation. There are 3 lessons within this guide that have been adapted from Ramsey (2013).

For an introduction to the topic of personal finance, feel free to watch the following video:



- Anxiety
- Body Scan
- Breath
- Brief Practice
- Education and Assistance
- Energizing
- Guided Meditations
- Meditations
- Mindfulness Practice
- Motivational
- OCD Assistance
- Quick Stress Relief
- Relaxation
- Relaxation Stories for Children
- Retreat Meditations
- Self Guided Meditations
- Self-esteem Assistance
- SportPsych Training
- Uncategorized

Mindfulness Exercise



Just sit in a comfortable position, close your eyes and listen

Mindfulness exercise on 7cot

DATA SET DESCRIPTION

- ▶ The dataset used for analysis was provided by the administrators of 7cot which capture the attributes of all users, interactions, and activities performed since its inception on December 5th, 2013 through August 18th, 2015. It includes metadata about every user except for those attributes related to the user's true identity and contact information.
- ▶ Dataset cannot be shared publicly due to a non-disclosure agreement.

USERS AND CONVERSATIONS ANALYSIS KEY FINDINGS :

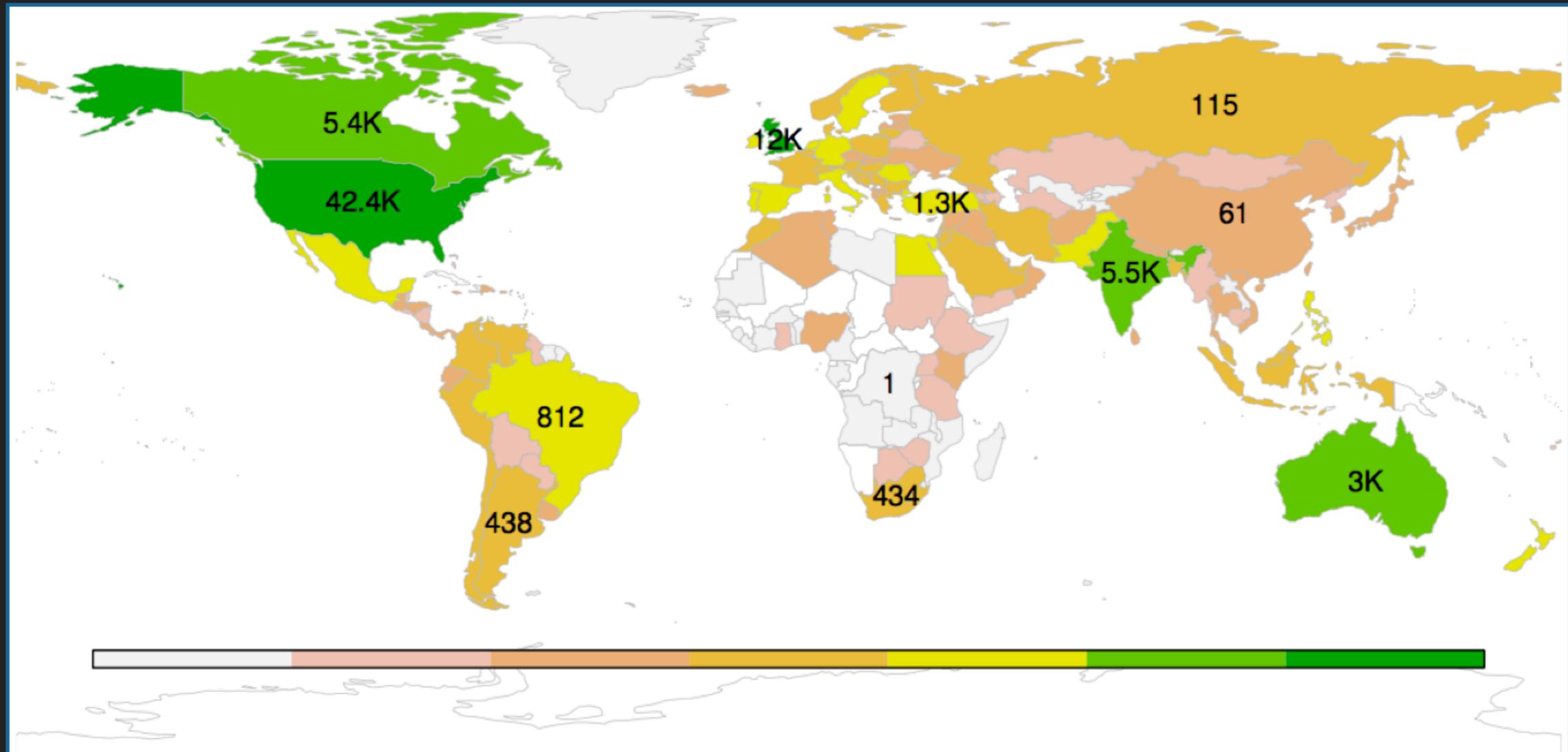
- ▶ Being a registered member on the website has more benefits as compared to being a guest user and therefore could lead to better health outcomes.

- ▶ Listeners on the website come from virtually every part of the world, which demonstrates the world wide adoption of this platform and its popularity. Another interesting fact is that, teenagers also tend to use this platform and are comfortable with it.

Num. Users	452,605 (Members) ; 1,043,821 (Guests)
Num. Listeners	82,886 (Members); 82,835 (Guests)
Num. Member Conversations	403,903 (teen); 951,701 (adult)
Num. Guest Conversations	491,140 (teen); 1,231,414 (adult)
Avg Num. of Conversations	4.56 (members); 1.65 (Guest)

Volume of Users and Conversations

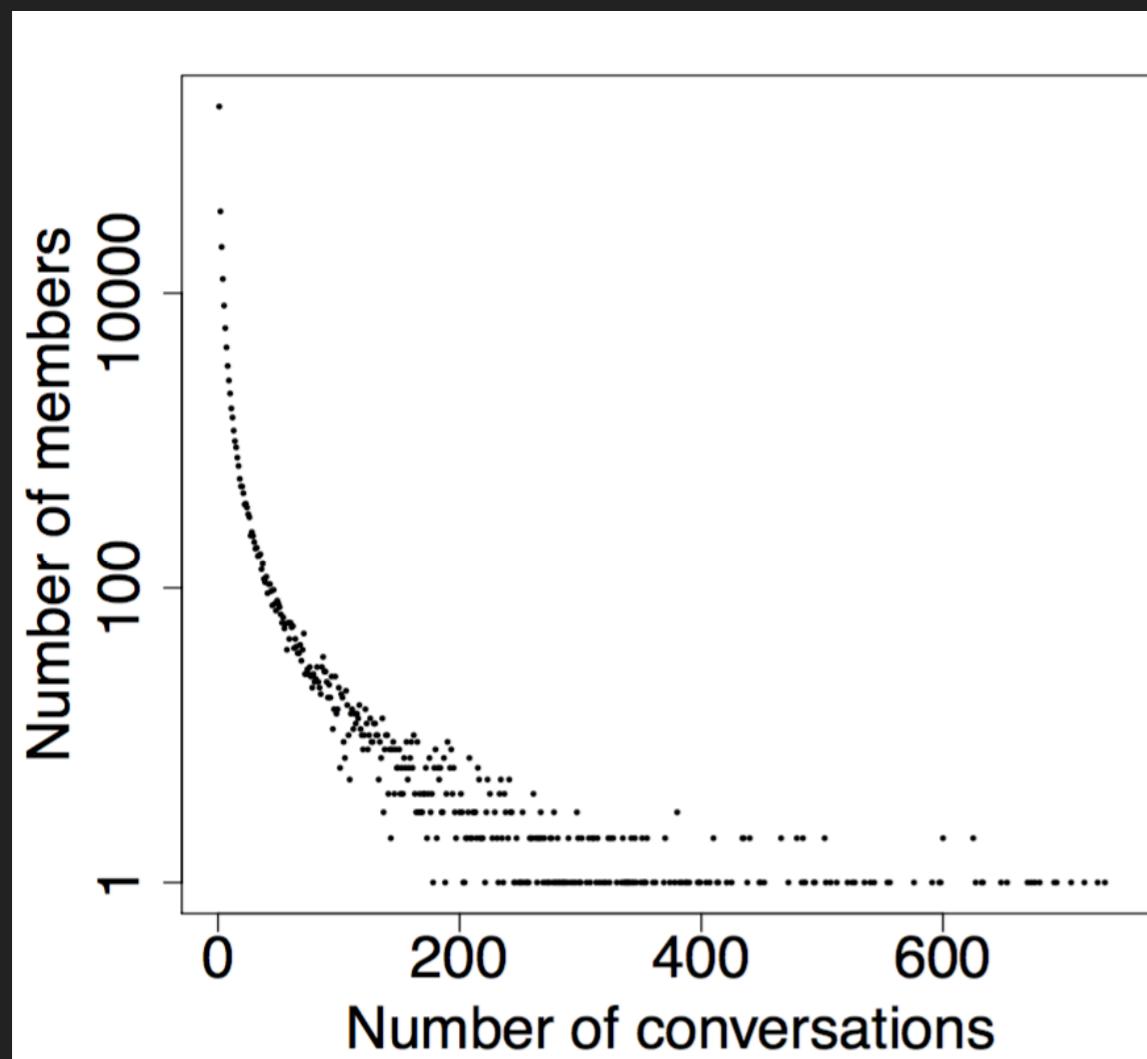
There are 169,372 distinct listeners on 7cot who come from virtually every part of the world



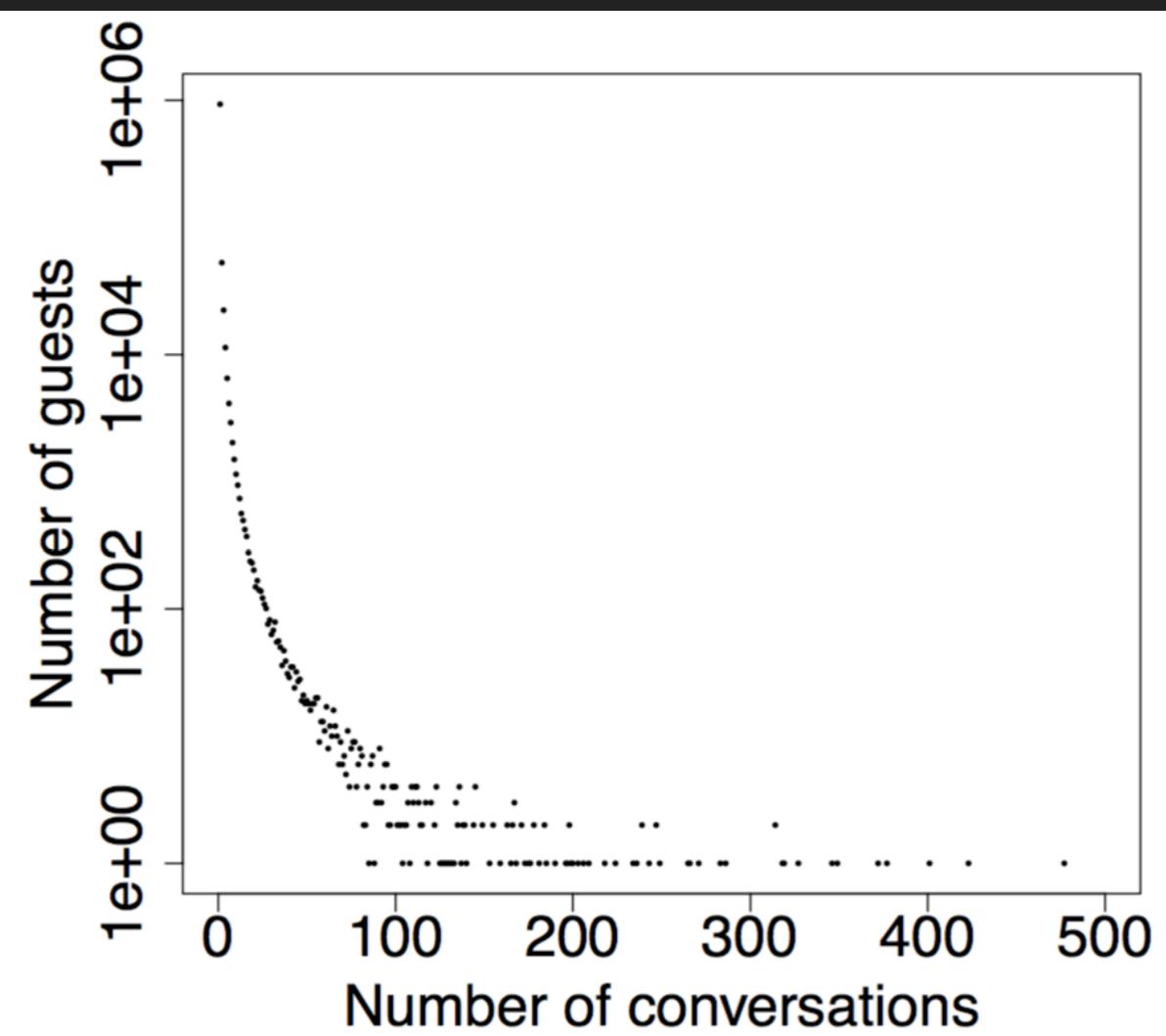
Locations of 7cot listeners across the world

USERS AND CONVERSATIONS ANALYSIS KEY FINDINGS :

- ▶ Behavior of some of the users is very anomalous as they seem to be very seasoned and thus making it difficult to say whether heavy tail phenomenon exists on this platform or not.



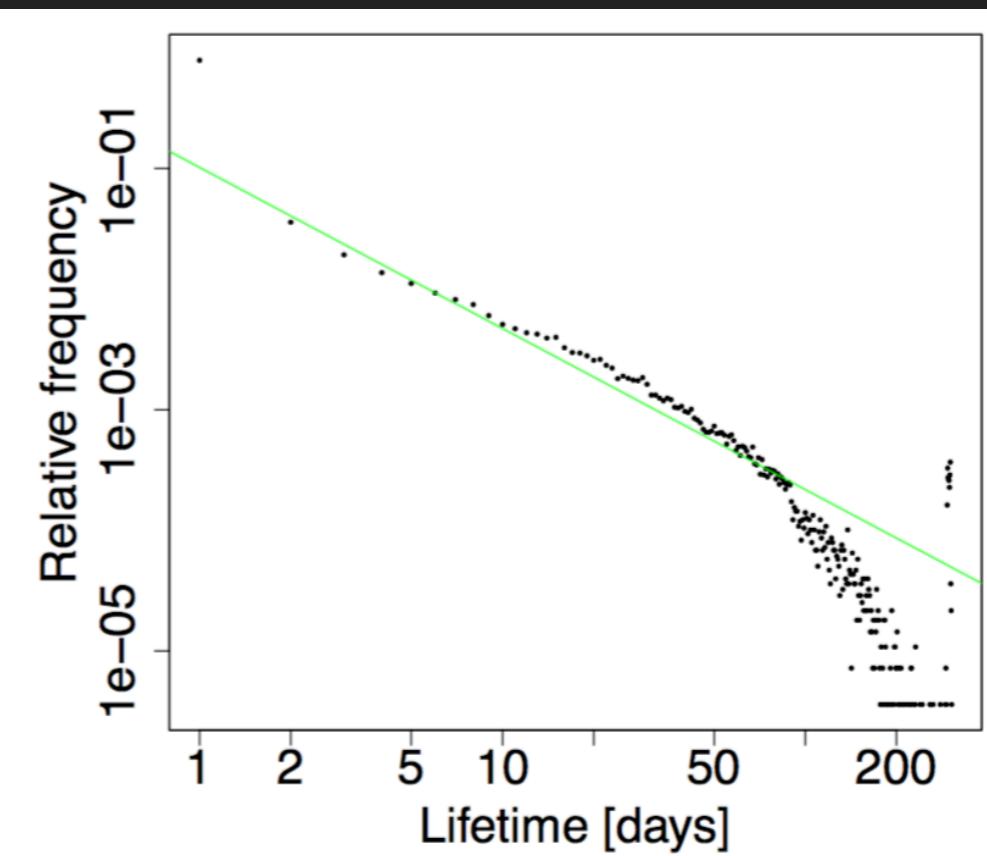
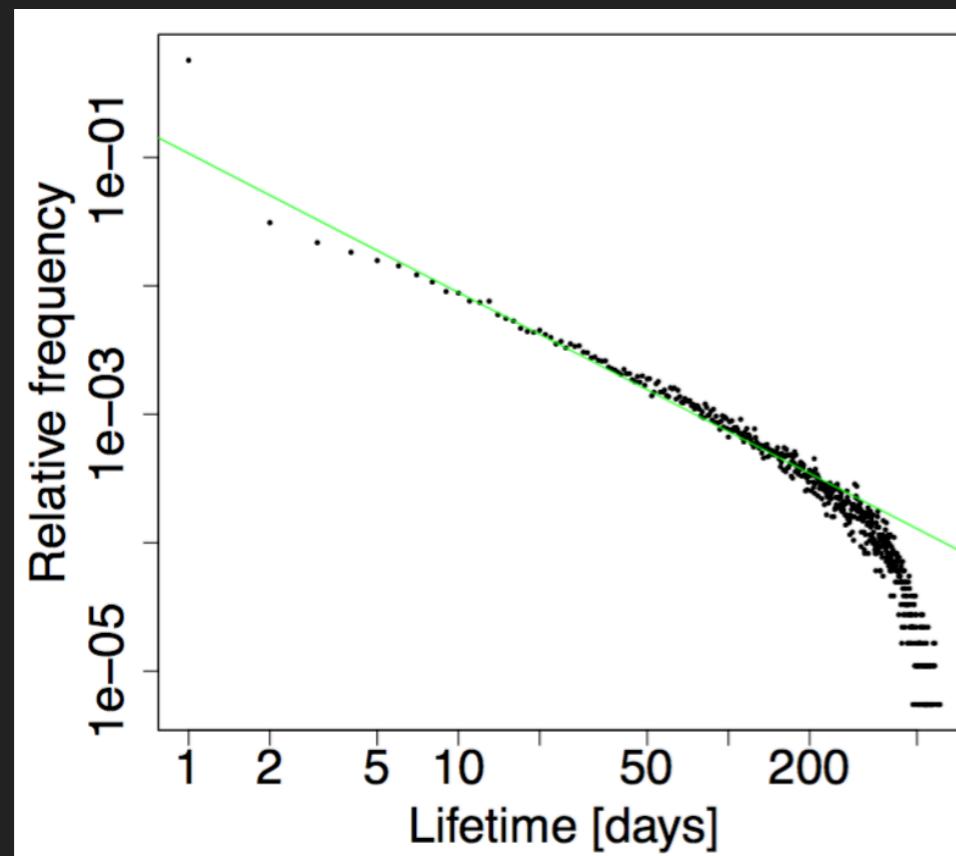
Members



Guests

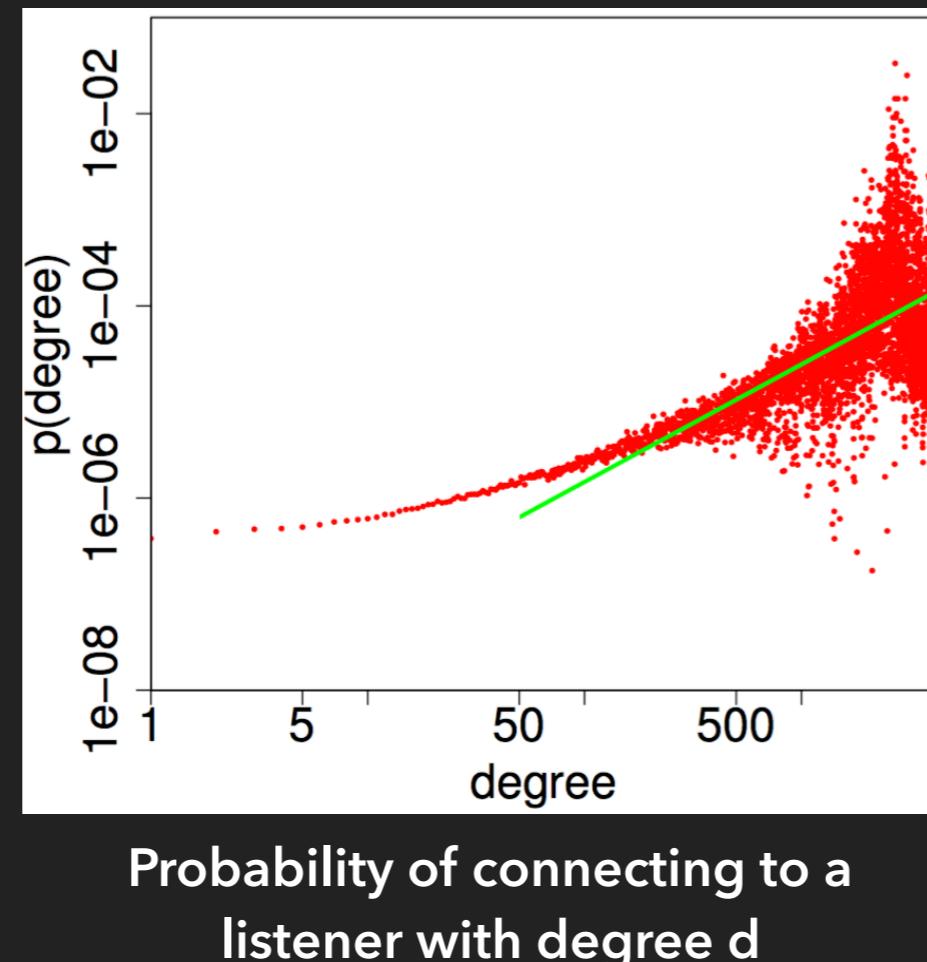
USERS AND CONVERSATIONS ANALYSIS KEY FINDINGS :

- ▶ The lifetime of the first conversation and the last conversation created by a members and guest users closely follow double pareto lognormal distribution (DPLN) which the duration of mobile phone calls are known to follow.
- ▶ The mechanisms about how long people choose to converse with someone on the emotional support service is therefore quite similar to conversations over mobile phones, suggesting that the conversations may exhibit a very natural flow and length that is similar to what one would hold if they were discussing their problems over the phone

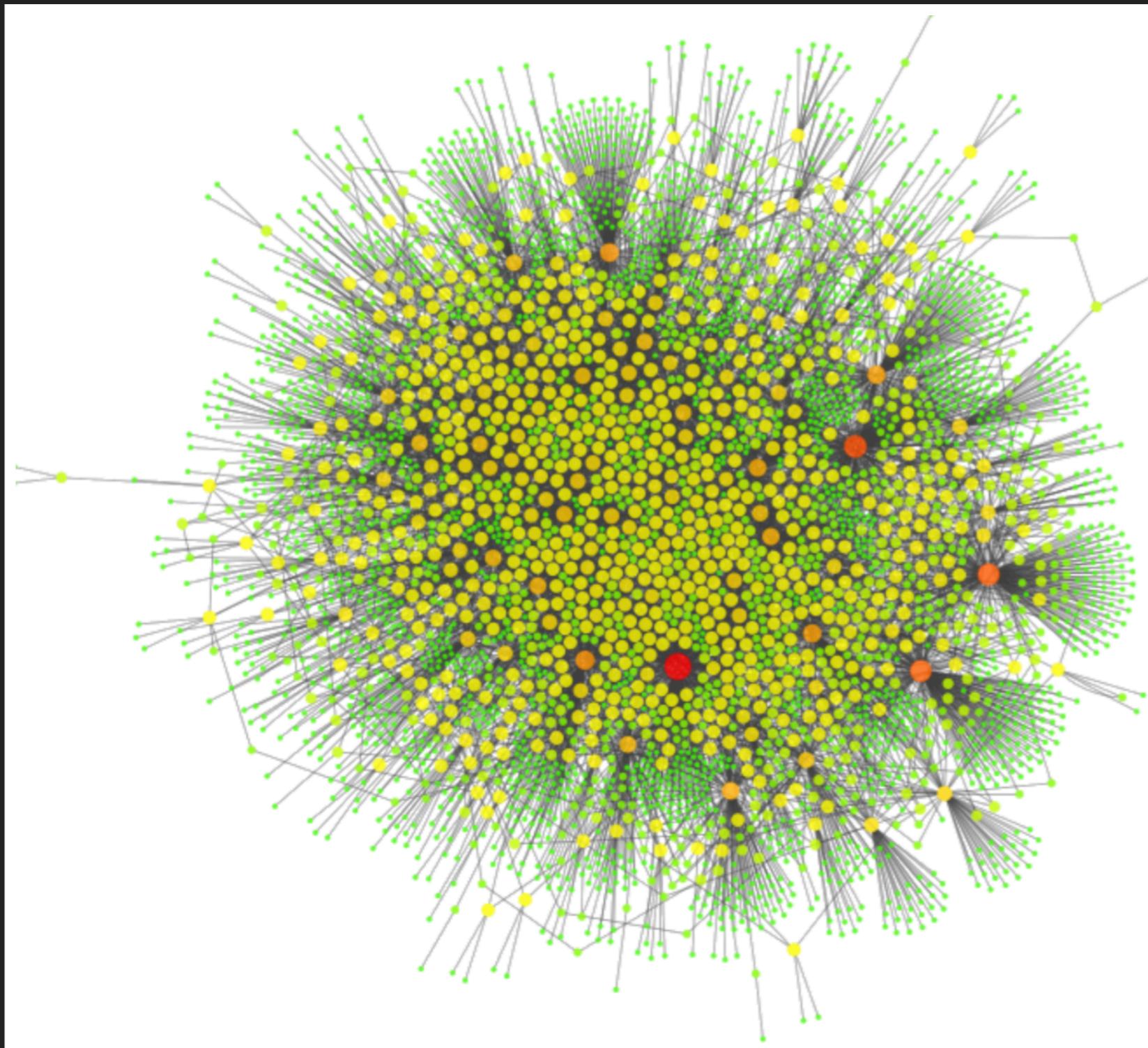


USERS AND CONVERSATIONS ANALYSIS KEY FINDINGS :

- ▶ Preferential attachment holds on the platform, where It illustrates the emergence of a rich-get-richer phenomenon in the development of the network.
- ▶ For example the members choose to connect with only the experienced listeners or those who have positive reviews or ratings compared to relatively new listeners.



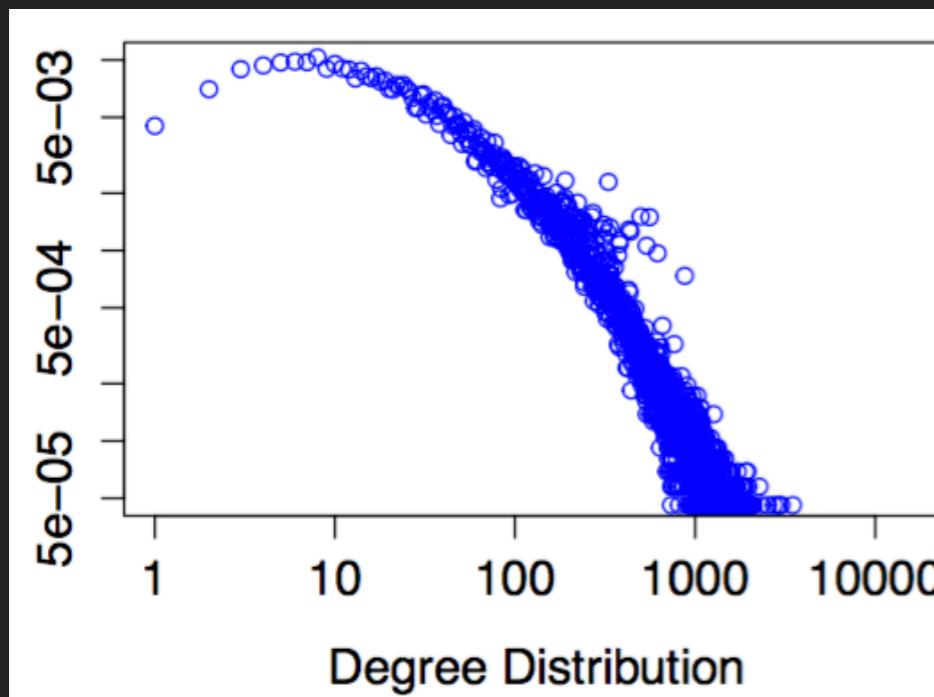
INTERACTION STRUCTURE



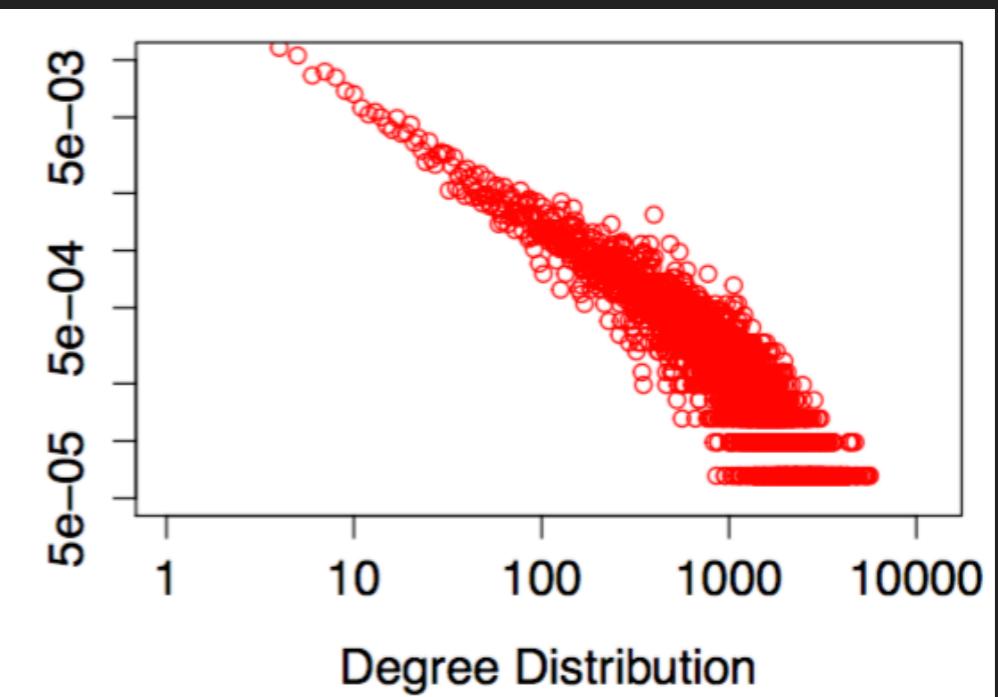
7cot bipartite network from Dec 2013- Nov 2014; listeners are green and members are colored with hotter colors by their degree.

INTERACTION STRUCTURE KEY FINDINGS :

- ▶ The giant connected component of the bipartite network include almost all the users of the platform, which tells us that only few users choose to exclusively search for and speak with each other.
- ▶ The degree distribution of listener projection network looks to follow a power law distribution but same may not be said for the degree distribution of member projection network. This suggest that subset of members may tend to develop deep and strong relationships with only some of the listeners rather than having an "exploratory" behavior where they are trying to connect with as many listeners as possible, whereas, some listeners will prefer to connect to as many members as possible.



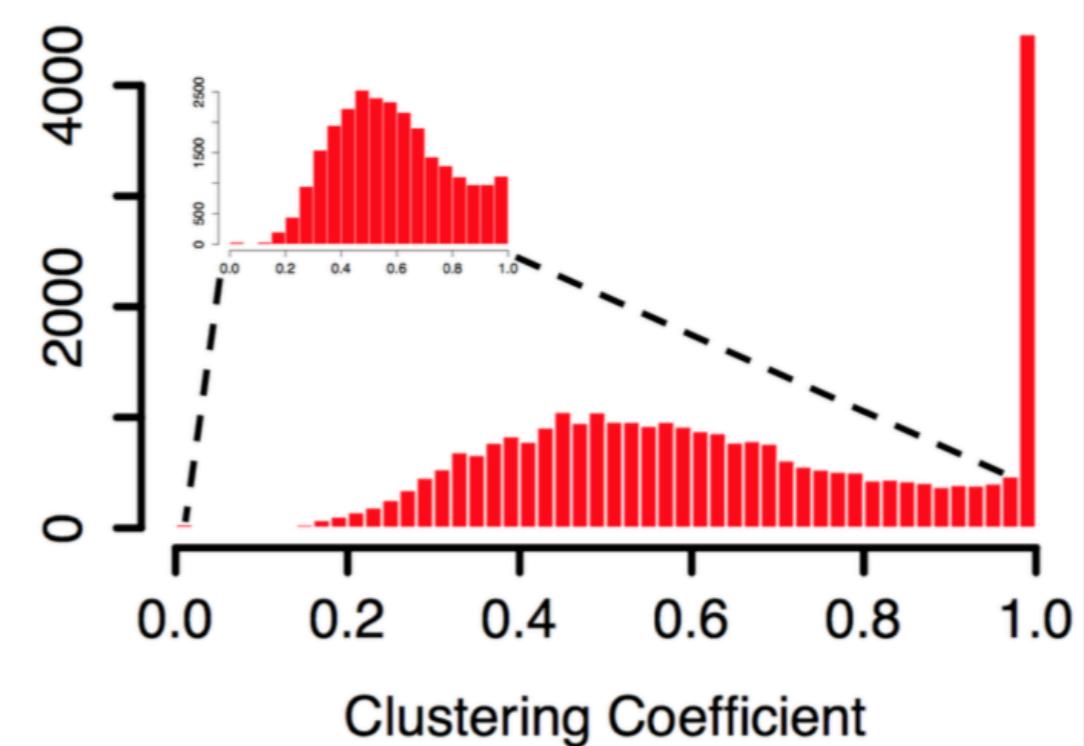
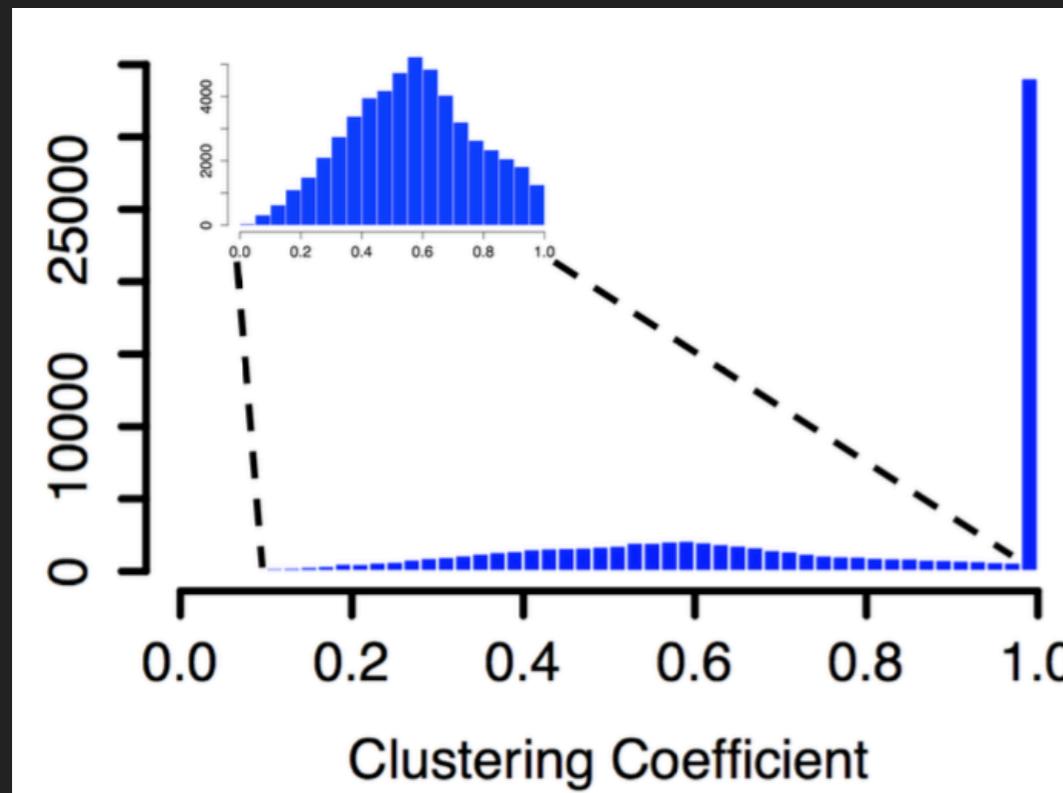
Members



Listeners

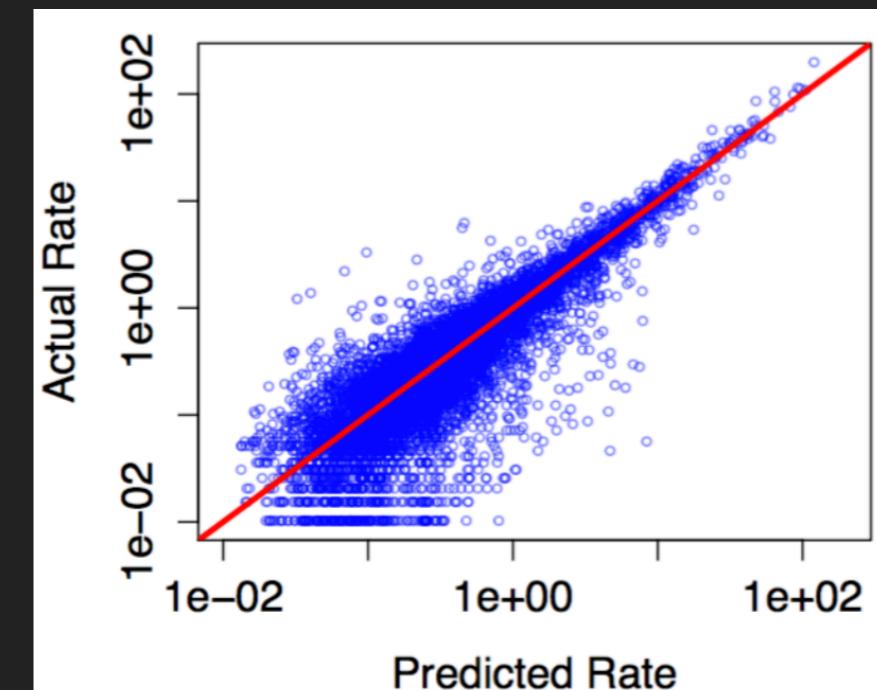
INTERACTION STRUCTURE KEY FINDINGS :

- ▶ The clustering coefficients of the member and listener projection appears to be normally distributed as is seen in many co-occurrence networks. A small percentage of members and listeners exhibit perfect clustering coefficients which is unique to this platform.
- ▶ This suggests that both members and listeners perform deliberate actions that drive them into fully connected neighborhoods in the projection networks. For example, members may be selectively connecting to the same pool of listeners that may have similar ratings, reviews, experiences, or bio's suggesting an expertise that members in their neighborhood do.

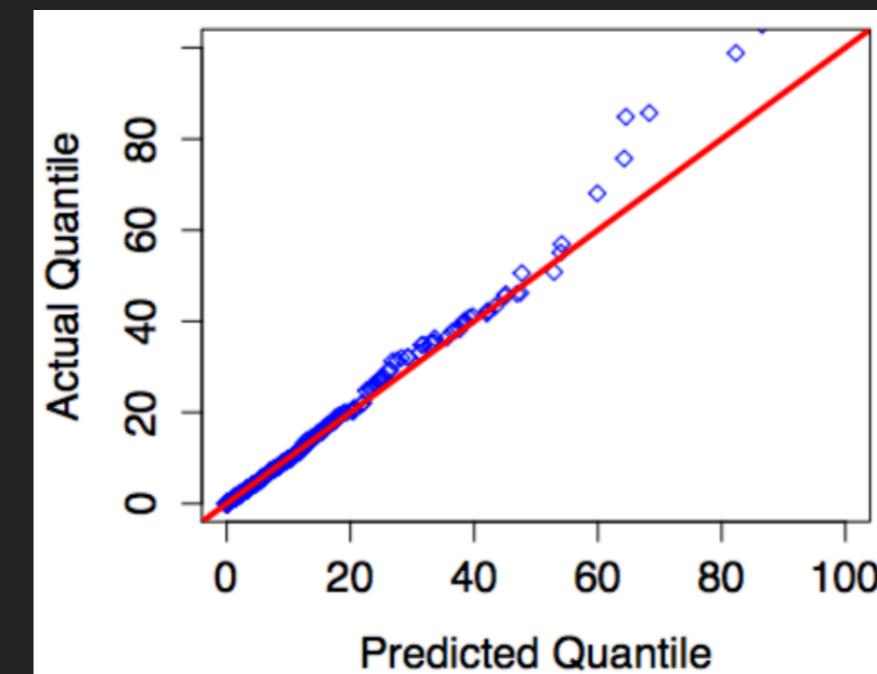


UNDERSTANDING USER ENGAGEMENT

- ▶ We quantify user engagement as message rate and consider a random forest model that predicts user engagement by a regression over all features and behaviors that may be related to engagement shown in the feature importance plot.
- ▶ We compute the importance of each feature to the random forest regression model by the mean square error (MSE) of the random forest predictions against the actual engagement of every user



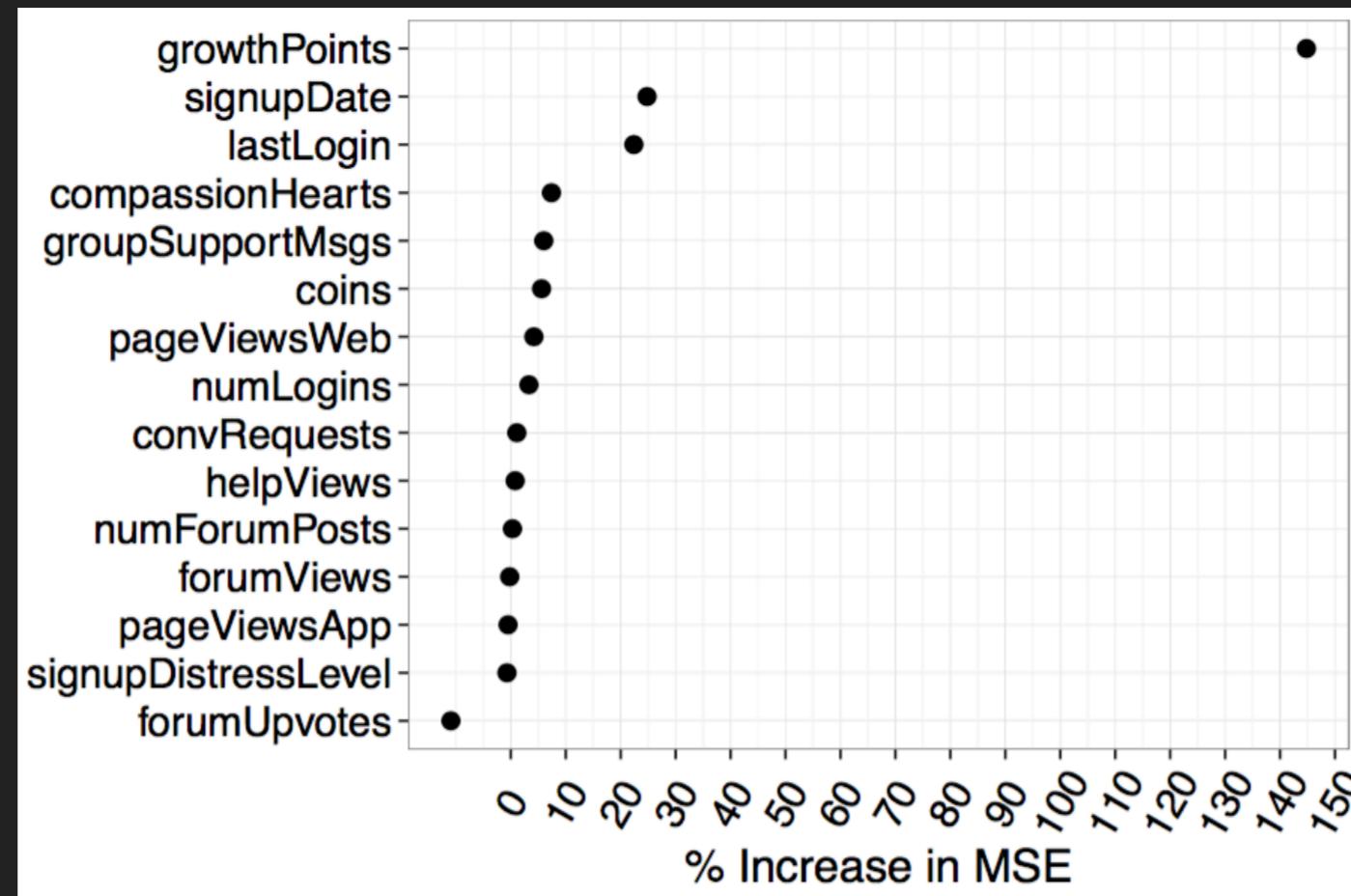
Predictions plot of Random Forest model with $R^2 = 89\%$



QQ plot shows normally distributed errors for users with low engagement

UNDERSTANDING USER ENGAGEMENT

- ▶ Some key insights are :-
- ▶ Users tend to exhibit similar level of engagement on the website irrespective of their emotional distress level or type.
- ▶ The gamification mechanisms integrated in the platform are very important for the user to stay engaged on the website.



Feature Importance plot in Random Forest Model

CYBERBULLYING ANALYSIS

- ▶ Cyberbullying is the worst kind of evil born out of online social networks. No matter the online social system, cyberbullying should be expected to occur and 7cot is no exception.

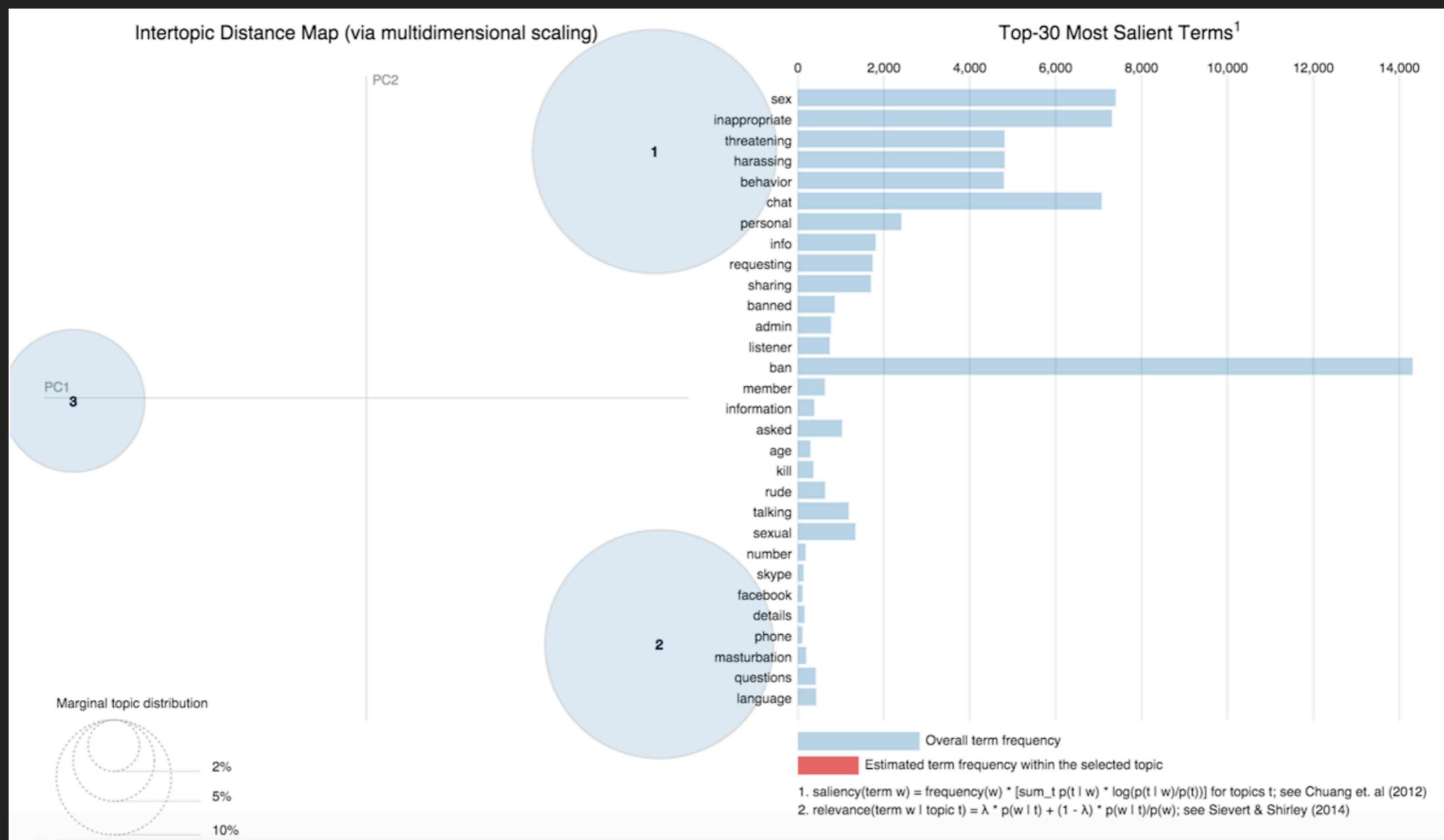
Users	Count	Percentage
Num. Members	452,605	-
Num. Listeners	169,372	-
Conversations	3.2 M	-
Cyberbully Members	19,281	4.26%
Listeners exposed to a cyberbully	37,262	22%

Summary of Users and Cyberbullies

CYBERBULLYING ANALYSIS

- ▶ Each 7cot listener has the opportunity to block a member from communicating with them in a one-on-one conversation on the site. We postulate that block events only occur if a member bullies a listener during a conversation.
- ▶ When a listener elects to block a member, he/she is allowed to enter a note as to why the block is applied. 7cot administrators regularly review these notes to identify members that should be banned from the site for constantly bullying others.
- ▶ Notes left by listeners when they elect to block a member provides some insight into how and why a listener may have been harassed by the cyberbully. We employ a topic modeling tool called **LDAVIS** that partitions documents in a corpus into clusters which is suggestive of a latent topic or theme in the documents. There are **14,872** notes in the dataset which we analyzed.

- ▶ The clusters are very far from each other, and interestingly, cover distinct quadrants. This is a strong indication that the terms of each cluster are very distinct, i.e., that there are three prevailing themes of the kinds bullying performed by members.
- ▶ Topic 1 refers to sexual harassment whereas, topic 2 and topic 3 refers to aggressive behavior and trying to acquire personal information respectively on the cluster map.
- ▶ Sexual harassment is the most dominant form of bullying on the site, as **45.1%** of words across the entire set of blocking notes contain words seen in this document cluster whereas **39.5%** of words in the set of notes are seen from Rude behavior cluster and **15.4%** from Personal Information cluster.



Inter-topic map of LDAVIS clusters

Cyberbullying Theme	Top Words
Sexual Harassment	Sex, Porn, Horny, Dirty, Naked
Rude/Aggressive Behavior	Abusive, Insulting, Swearing, Angry, Rude
Personal Contacts	Personal, Info, Location, Skype, Phone

Top words for each theme

KEY IMPLICATIONS

- ▶ These findings have many implications about how people use crowdsourced emotional support systems. The behavior of members may not be exploratory in nature where the objective is to connect with many listeners possible but on the contrary it suggests that they may have thoughtful conversations with only few listeners and prefer to connect with them.
- ▶ Preferential attachment phenomenon also holds on this platform which also reaffirms the fact that members tend to choose to have conversations with their listeners very carefully, maybe only after reviewing their profile, ratings, reviews and overall experience. So selection of a listener for having a conversation looks highly competitive.
- ▶ On the other hand, it appears that some of the listeners are willing to help and support to as many members as possible. Also the fact, that listeners are able to support for number of different emotional problems again reaffirms their willingness to help multiple users facing multiple emotional problems.

KEY IMPLICATIONS

- ▶ Statistical nature of conversation lengths on the platform is quite similar to that of length of mobile phone conversations.
- ▶ Engagement analysis also demonstrates the importance of gaming mechanisms for tracking user progress, which may serve as additional motivation for the users to help each other.
- ▶ Cyberbullying analysis also revealed the common themes of cyberbullying observed on other platforms, on this platform as well and demonstrated the effectiveness of standard measures adopted to thwart cyberbullying.
- ▶ The findings show some commonalities between users using other online social networks and users using 7cot such as normally distributed clustering coefficients of the users, while at the same time it also revealed some unique insights which only the users of 7cot tend to follow. For eg. small percent of users having perfect clustering coefficients.

FUTURE WORK

- ▶ Future work will include studying how cyberbullying grows or spreads, for example if a person have been cyberbullied, how likely is it that he/she will cyberbully somebody else, or in other words does being a victim of cyberbullying encourages the victim to cyberbully someone else ?
- ▶ We would study the networks of the bullies and that of the victims who got cyberbullied and will analyze whether the structural properties of these networks show significant distinctions which could lead to some new insights about the behavior of the cyberbullies as compared to normal users.
- ▶ We will also explore other machine learning models to improve engagement analysis.