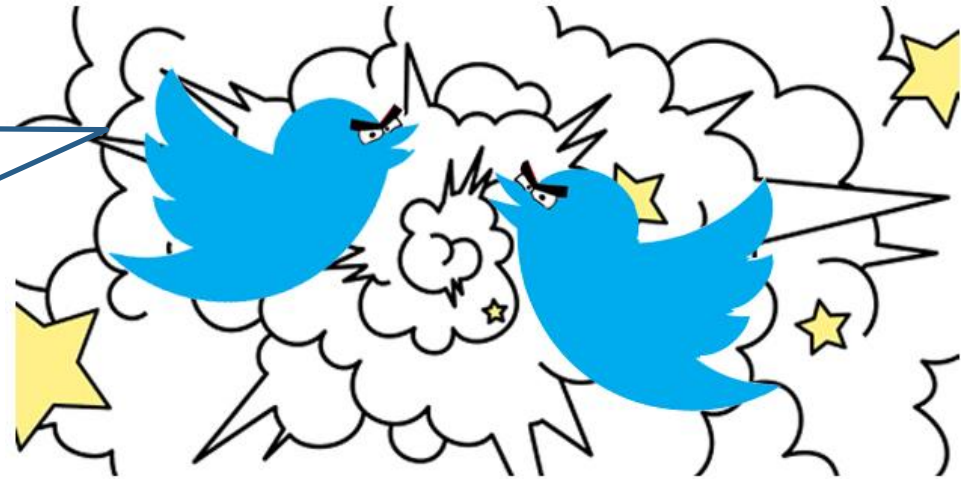


I may praise you  
in English *lekin*  
*gaali* toh Hindi  
mein hi denge!



# A study of Code-Switching and Swearing Patterns on Social Networks

Ashish Sharma

| IIT Kharagpur

Prabhat Agarwal

| IIT Kharagpur

Jeenu Grover

| IIT Kharagpur

Mayank Sikka

| IIT Kharagpur

Koustav Rudra

| IIT Kharagpur

Monojit Choudhury

| Microsoft Research, India

# INTRODUCTION

## ❖ Swearing or Cursing or Profanity or Abusing

- Use of rude, impolite, offensive, obscene, or insulting words and phrases

## ❖ Twitter: Free speech hardcoded into its founding ethos



# How Acquiring of Twitter Failed?

- ❖ User and revenue growth: “stalled” to “slow”
- ❖ Avoided implementing any major changes that would stem the tide of abuse

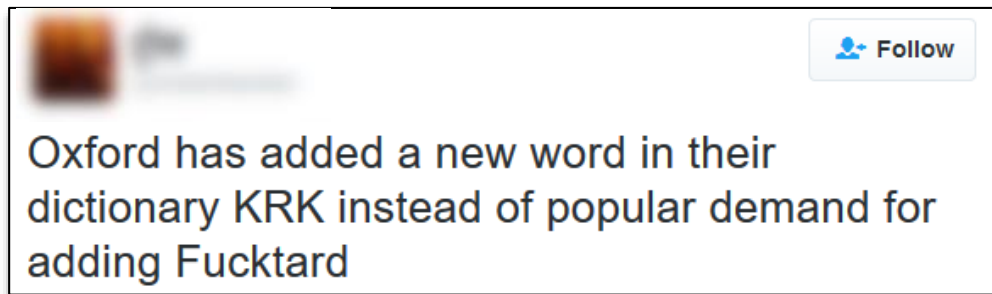


“ Twitter's sexist, racist, and otherwise unpleasant abusers would sully Disney's image ”

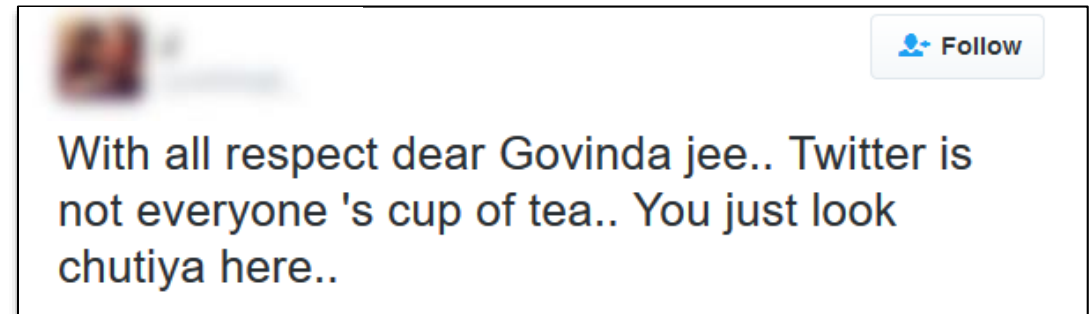
“ What's happened is, a lot of the bidders are looking at people with lots of followers and seeing the hatred ”

# Code Switching & Swearing

- ❖ Do speakers exhibit a language preference for swearing?



English?

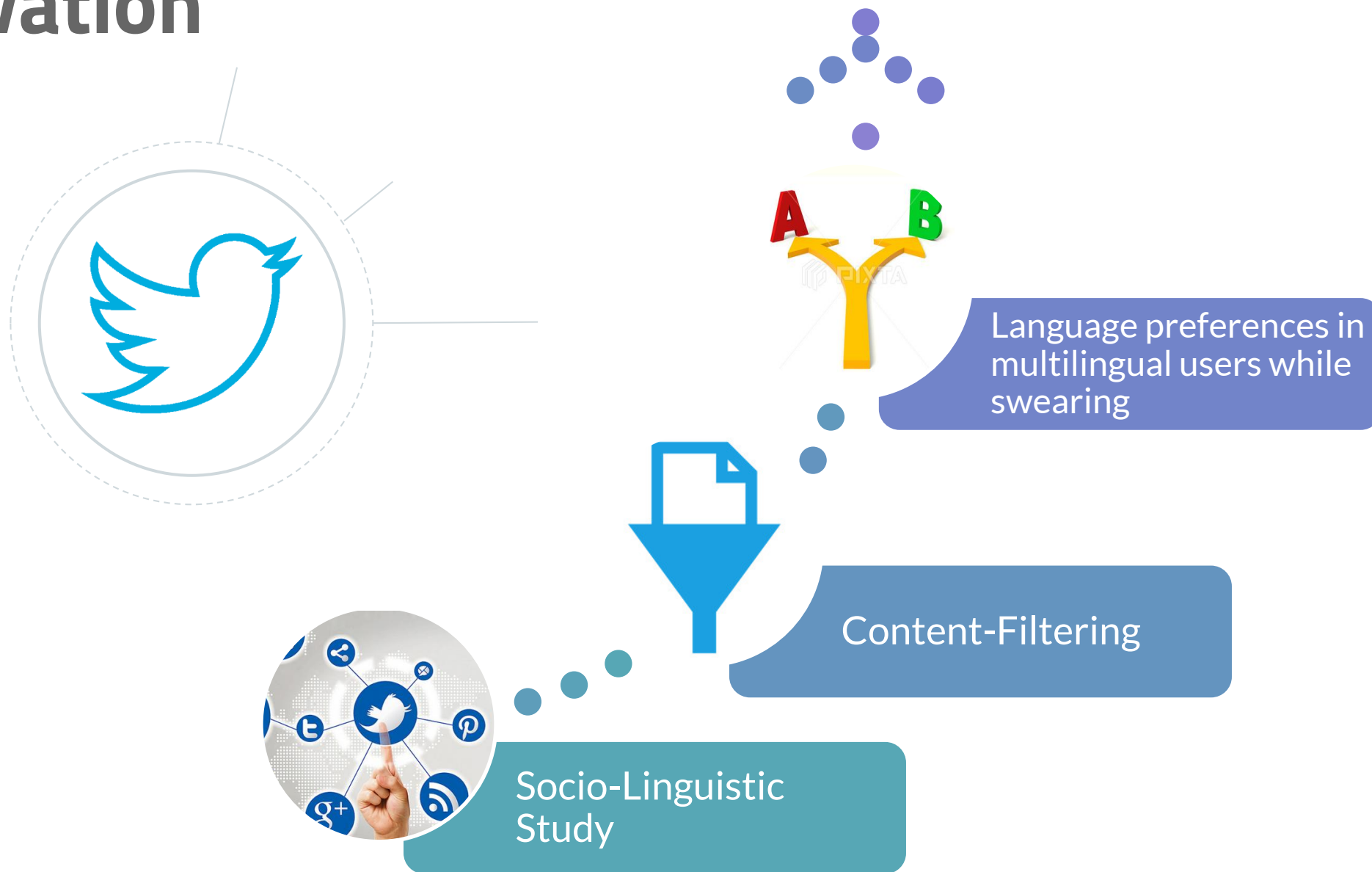


Hindi?

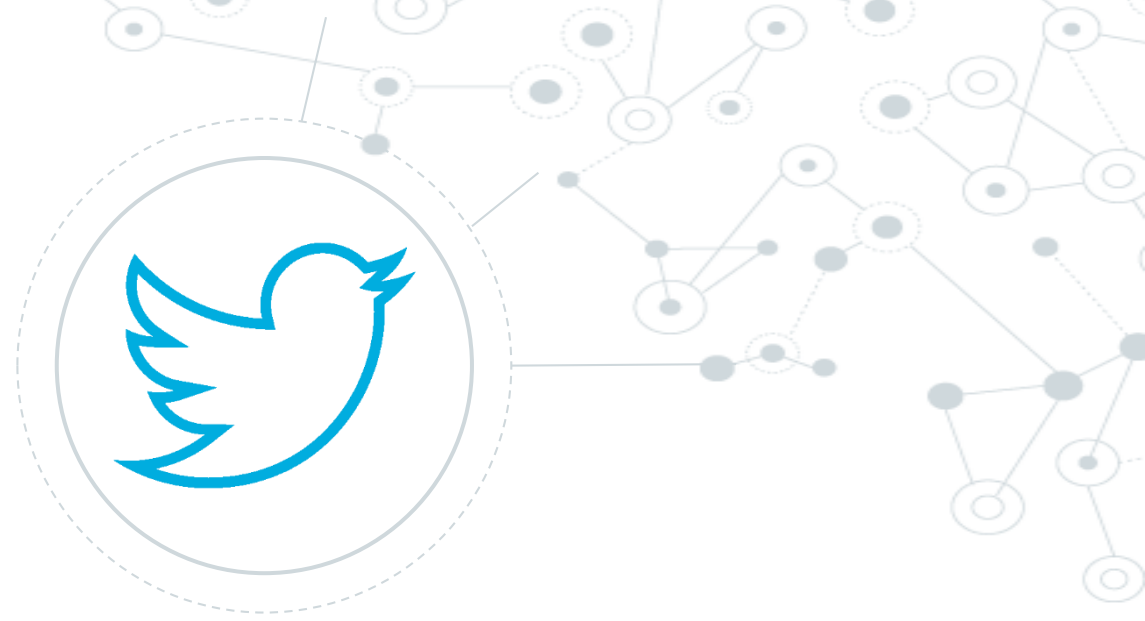
- ❖ What factors determine this preference?

# Motivation

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# A Study of Code-Switching and Swearing Patterns on Twitter



Identify  
Swearing  
Tweets

Language  
Preference of  
Multi-linguals

Factors  
driving the  
Preference



# Tweet Corpus

## ❖ Collection of Tweets

- Twitter Search API [1]
- India Specific Hashtags and Trending topics from India

❖ No of Tweets: **853,685**

❖ No of Users: **274,354**

[1] <https://api.twitter.com/1.1/>

# Swear Word **Lexicon**

## ❖ Romanized Hindi and English Swear Words

1. Available Lexicons online
  2. Online Survey
- Survey important to capture **surface forms**
  - **659** Hindi Swears and **789** English Swears

# Non-Swear Word **Lexicon**

- ❖ **25,868** non-swear Romanized Hindi words created by Gupta et al. [2]

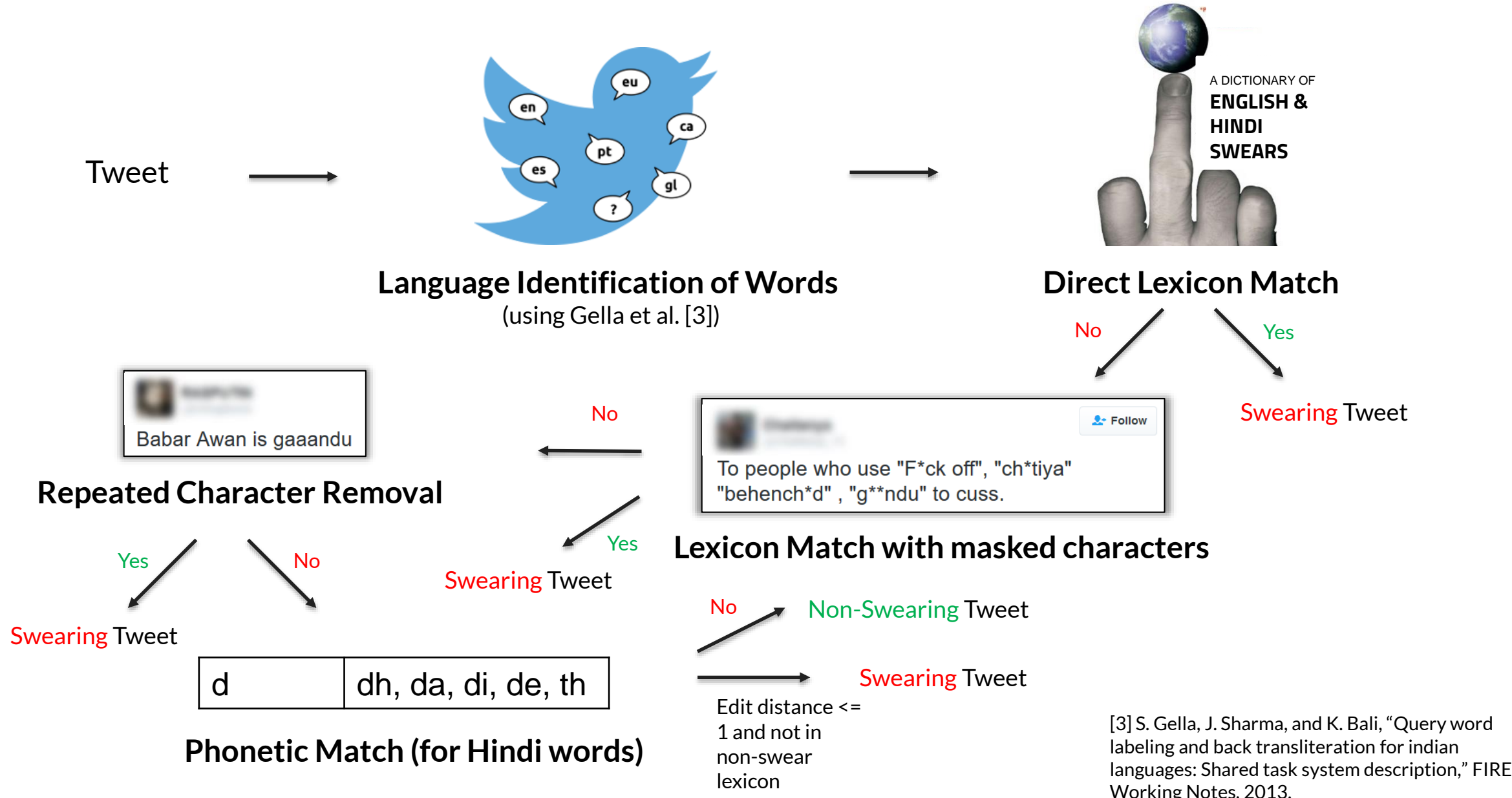


# CHALLENGES INVOLVED

- 1 **Language of Tweet and its words** needs to be inferred
- 2 **Spelling variations** in transliterated languages (behenchod, bhenchod, bahinchod, benchod)
- 3 **Masking of characters** in swear words (f%ck, f.ck, f#ck, f\*ck)
- 4 **Swearing is Context-Dependent**
  - Sale in English vs. sAle in Hindi
  - chod (choda = fuck) vs Cho.Da (= leave)

# SWEARING TWEET DETECTION ALGORITHM

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# ACCURACY

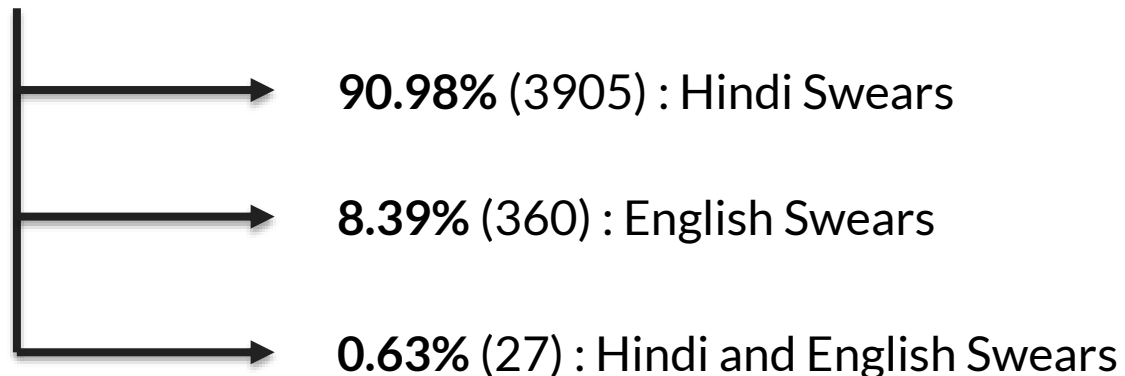
- ❖ Random sample of 915 tweets: half positive, half negative
- ❖ Sample was manually annotated
- ❖ Precision: 0.73
- ❖ Recall: 0.96

# CODE SWITCHING AND SWEARING

	Total Tweets	Swearing Tweets
English	741170	8416 (1.14%)
Hindi	41672	8,367 (4.22%)
Code Switched	70843	29,293 (6.06%)

Swearing Tweet Distribution based on Language

## ❖ 4292 Code-Switched Swearing Tweets



# CODE SWITCHING **AND SWEARING**

## ❖ Observations

- 1 Lot of swearing in **Hindi**
- 2 Bilingual users (English+Hindi) **prefer to swear in Hindi**

## ❖ Arguments & Conclusions

- 1 Preference for swearing in dominant or **L1 language** on Twitter
- 2 Swearing : important **motivating factor** behind code-switching

# GENDER, CS AND SWEARING

## ❖ Gender Detection

- Male and female names **differ considerably** in general
- **NamSor Gender API** [4]: Determines gender of a person on a -1(Male) to +1(Female) scale.
- Accounts of **news channels, organizations, fake names, fan clubs** etc. like Times of India, Arvind kejriwal FanClub were filtered

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No. of Hindi Swearing Tweets by Males

-----  
Total no. of Swearing Tweets by Males

	Male	Female
Hindi	15.38 %	12.11 %
English	58.42 %	63.07 %
CS (Hindi Swears)	22.77 %	20.90 %
CS (English Swears)	3.20 %	3.65 %
CS (Both Swears)	0.23 %	0.27 %

Ratio of swearing tweets in different languages to total swearing tweets of a particular gender class

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## ❖ Observations

- Females have **relatively greater tendency** to swear in English than males

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# TOPIC, CS AND SWEARING

## ❖ Topic Detection

- Manually **grouped into 8 topics based on hashtags**
- Celebrity, Politics, Religion, Sports, Movies & Entertainment, Current Affairs, Science & Technology, and Festivals

# TOPIC, CS AND SWEARING

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## ❖ Topic Detection

- Manually grouped into 8 topics based on hashtags

No. of English Swearing  
Tweets related to Celebrities

-----  
Total no. of English Tweets  
related to Celebrities

	English	Hindi	Code Switched
Celebrities	0.72 %	5.45 %	9.56 %
Sports	1.76 %	7.57 %	9.19 %
Current Affairs	1.79 %	5.70 %	6.90 %
Politics	0.89 %	3.29 %	4.08 %
Entertainment	0.64 %	1.75 %	4.76 %
Religion	0.55 %	3.38 %	4.76 %
Technology	1.29 %	0 %	3.53 %
Festival	0.42 %	1.43 %	2.24 %

% of swearing tweets per topic in English, Hindi and Code-Switched tweets

# TOPIC, CS AND SWEARING

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## ❖ Topic Detection

- Manually grouped into 8 topics based on hashtags

## ❖ Swearing Ratio

1

**High** in Celebrities,  
Sports, Current  
Affairs and Politics

2

**Low** in Religion  
and Festivals

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Celebrities	0.72 %	5.45 %	9.56 %
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# TOPIC, CS AND SWEARING

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## ❖ Swearing Ratio

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**Highly Opininiated**

2

**Low** in Religion  
and Festivals



**Sensitive Issue**



**Celebrations & Positivity**

# Conclusion

- Novel attempt to study the language preferences for multilingual users on twitter
- Multilinguals **strongly prefer L1** (dominant language) while swearing
- Swearing can be one of the **motivating factor for Code-switching**
- Use of L2 is **relatively more for females** than males
- Swearing ratio is **high in opinionated topics** and **low in sensitive issues and celebrations**

## Future **Work**

- Verifying these results for other multilingual societies
- Incorporating context while detecting swearing tweets

# THANK YOU !



"Ms. Jones, there are a number of big questions here to see you. They say they won't leave until they have some answers."