MISOGYNY ON TWITTER

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INTRODUCTION

Misogyny online is an increasing worry. According to authors such as Ellen Spertus (who first wrote about fighting online harassment in 1996), Jill Filipovic and Pamela Turton-Turner, the online space has long been a difficult place for women to operate. While the internet was seen as a utopian platform for free speech and equality when it began to become popularly used in the 1990s, it was evident from the very start that the inequalities that structured 'real-world' society had been transferred online.

Research has consistently found that women are subjected to more bullying, abuse, hateful language and threats than men when on-line. According to the Pew Research Centre's 2005 report 'How Women and Men Use the Internet', an 11 per cent decline in women's use of chat rooms stemmed from menacing comments.[1] Meanwhile, researchers from the University of Maryland set up a host of fake online accounts and then sent these into chat rooms. Accounts with feminine usernames received an average of 100 sexually explicit or threatening messages per day, whereas masculine names received 3.7.[2]

The subject was propelled into the public consciousness in the summer of 2013, when a number of prominent female journalists and activists in the UK were subjected to a sustained series of violent, rape, and bomb threats from Twitter users. Following these incidents, Amanda Hess, and American writer, documented her own experience of receiving rape threats from Twitter users in an in-depth piece for *Pacific Standard* in January 2014.[3]

Since then, the subject has provoked significant debate and discussion about the extent of misogyny on line – and on Twitter in particular – and what might be driving it. To give a rough and ready illustration, we ran a series of short studies in order to better understand the volume, degree and type of misogynistic language used on Twitter.

Methodology

In study 1, we collected all tweets in the English language which included the word 'rape' over the period 26 December 2013 – 9 February 2014, all of which from Twitter accounts based on the UK.

In study 2, we collected all tweets in the English language which included a series of terms that are broadly considered to be used in a misogynistic way over the period 9 January – 4 February 2014, all of which were from Twitter accounts based in the UK. In this analysis we only include tweets which contained the words 'slut' and 'whore', which were by far the most voluminous.

We subjected each data set to a number of analyses, using both qualitative and quantitative methods:

1) Volume over time

2) Different types of use

3) Who is using these words?

4) Case study: what drives traffic?

All tweets were publicly posted, and collected using the public Twitter Application Programming Interface (API).

To conduct the analysis we conducted both automated analyses using a technique called natural language processing; and qualitative analysis where a researcher carefully reviewed random samples of the data.

Key findings

- Between 26 December 2013 and 9 February 2014 there were around 100 thousand instances of the word 'rape' used in English from UK-based Twitter accounts. We estimate around 12 per cent appeared to be threatening.

- Women are as almost as likely as men to use the terms ‘slut’ and ‘whore’ on Twitter. Not only are women using these words, they are directing them at each other, both casually and offensively; women are increasingly more inclined to engage in discourses using the same language that has been, and continues to be, used as derogatory against them.

- Between 9 January and 4 February 2014 there were around 131,000 cases of ‘slut’ and ‘whore’ used in English from UK-based Twitter accounts. We estimate that approximately 18 per cent of them appears misogynistic.

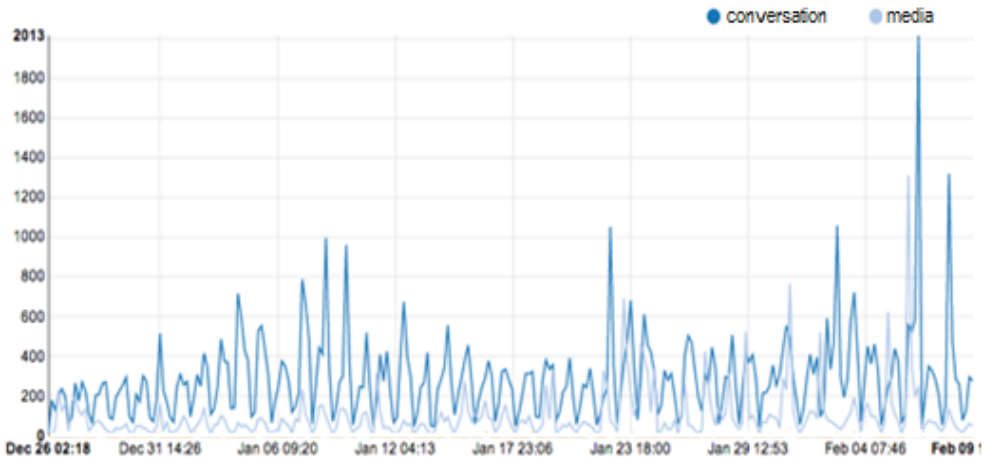
- There was a high proportion of ‘casual’ misogyny. Approximately 29 per cent of the ‘rape’ tweets appeared to use the term in a casual or metaphorical way; while approximately 35 per cent of the ‘slut’ and ‘whore’ tweets appeared to use the term in a casual or metaphorical way.

STUDY 1: USE OF THE WORD 'RAPE' ON TWITTER

Volume of use

Our initial search produced 2,725,097 tweets using the word 'rape'. When limiting this to tweets from only the UK, this number fell to 138,662. A relevancy classifier was then trained on the data in order to weed out all irrelevant tweets (eg tweets referring to rape seed oil). Once irrelevant tweets had been filtered out, we were left with 108,044 relevant tweets.

Figure 1 Use of the word 'rape' on Twitter



A classifier was trained to distinguish between tweets that were reporting or discussing stories about rape in the media and use of the word rape that were more conversational (ie people discussing rape, using the word colloquially, making threats, telling sick jokes etc.). 27,360 of this sample were media-related; and around 80,000 were 'conversational'.

Based on the above graph it is clear that media coverage and general discourse parallel each other closely. This suggests that media coverage tends to spark a broader discussion.

How is it used?

Based on a manual analysis of 500 randomly selected cases, we found the following split in use types.

Table 1 Types of usage of the word 'rape' on Twitter

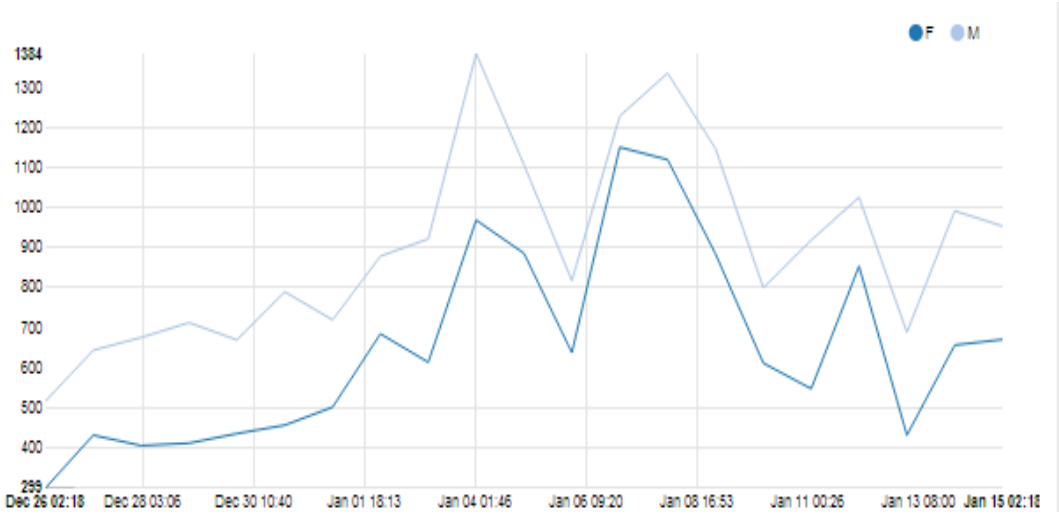
Type	Proportion	Extrapolated weekly number	Example tweet
Serious / news	40%	4396	
Metaphor / casual	29%	3187	*@^^^ That was my famous rape face ;) LOL Joke* *Barcelona Vs Celtic should not be shown on television as a football game but rather as rape*
Threat / abusive	12%	1319	*@^^^ can I rape you please, you'll like it*
Other	27%	2967	*Rape mmeeeeeee, #Nirvana*

Who is using it?

Over the time period, there were 49,669 unique users contributing to the 'conversation' data set. Of those users, men use the word 'rape' more than women, although it is not a significant difference.

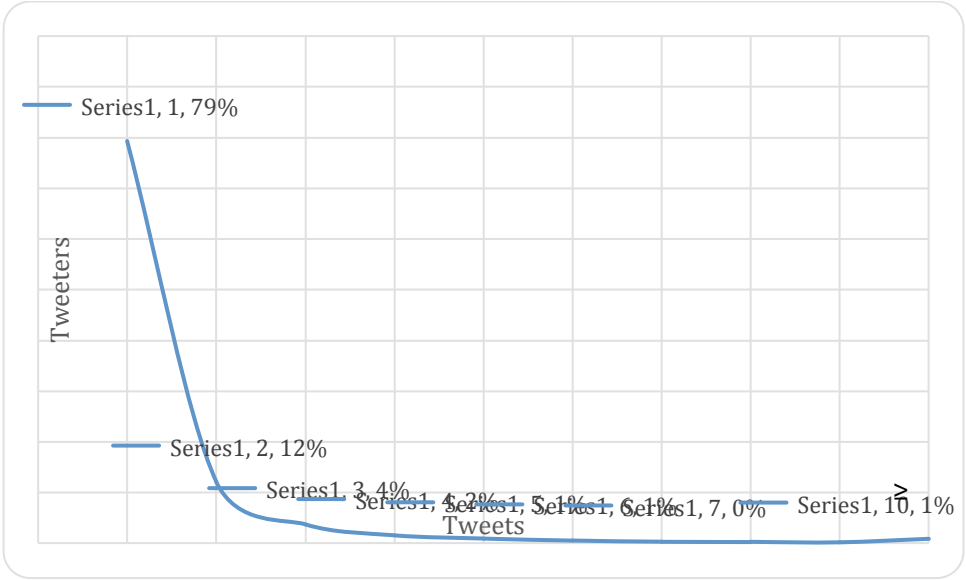
Based on a random sample of 381 user-profiles of people who tweeted as part of the non-media-related conversation about rape, we found that 4 per cent of users made some reference to gender-related activism, 2 per cent appeared to be overtly sexist, 9 per cent expressed some kind of maladjustment or anti-social sentiment, 8 per cent mentioned sports, 10 per cent mentioned politics in some way and 12 per cent mentioned music.

Figure 2 Use of the word ‘rape’ in conversation tweets by gender



Power law analysis was carried out on all conversation tweets making reference to the word ‘rape’ in order to establish how frequency of use was distributed among users: 79 per cent of users tweeted only once, 12 per cent twice, 4 per cent three times. The most prolific tweeter of ‘rape’ tweeted 392 times.

Figure 3 Power law of use of the word ‘rape’ in conversation tweets

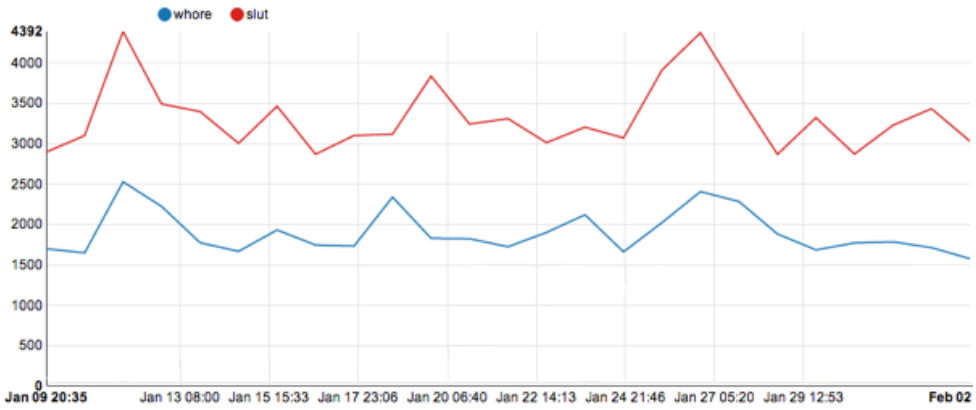


STUDY 2: USE OF THE WORDS 'SLUT' AND 'WHORE'

Volume of use

Our initial search produced 6,001,865 tweets which we filtered down to 161,744 coming directly from the United Kingdom. A relevancy classifier was then trained to remove all irrelevant tweets leaving us with 131,711 tweets that used the words 'slut' and 'whore'. 48,006 contained the word 'whore', 85,204 contained 'slut'.

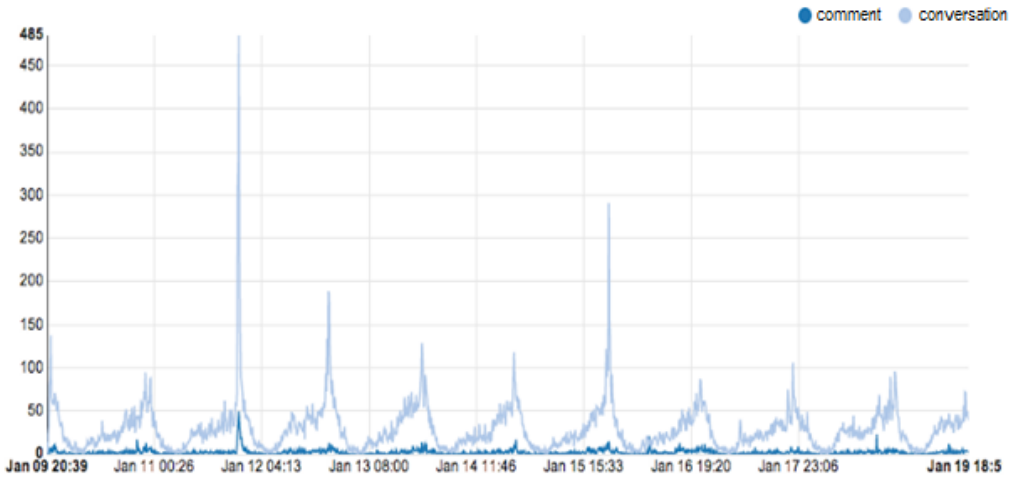
Figure 4 Use of the words 'slut' and 'whore' on Twitter



In the 'rape' data set there were a significant proportion of media stories being shared: which was not the case in the 'slut' and 'whore' data sets. Therefore, using the same technique as study 1, we automatically split the data into 'comment' (tweets which were about the use of word itself) and 'conversation' (tweets which included the word as part of a conversation). We found 7,993 tweets that were commenting on usage of these words, 108,409 that were actual conversational usage.

In a similar way to the 'rape' tweets, the broad pattern of traffic is relational: a small number of comment tweets to correlate with a wider set of conversations. However, the causal relationship is not clear.

Figure 5 Comment and conversation uses of 'slut' and 'whore'



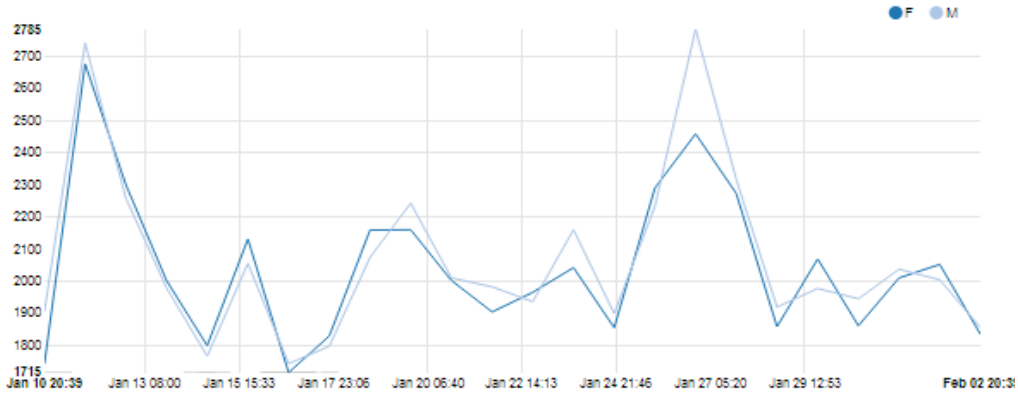
How are they used?

Based on a manual analysis of 500 randomly selected cases, we found the following split in use types.

Table 2 Types of usage of misogynistic words on Twitter

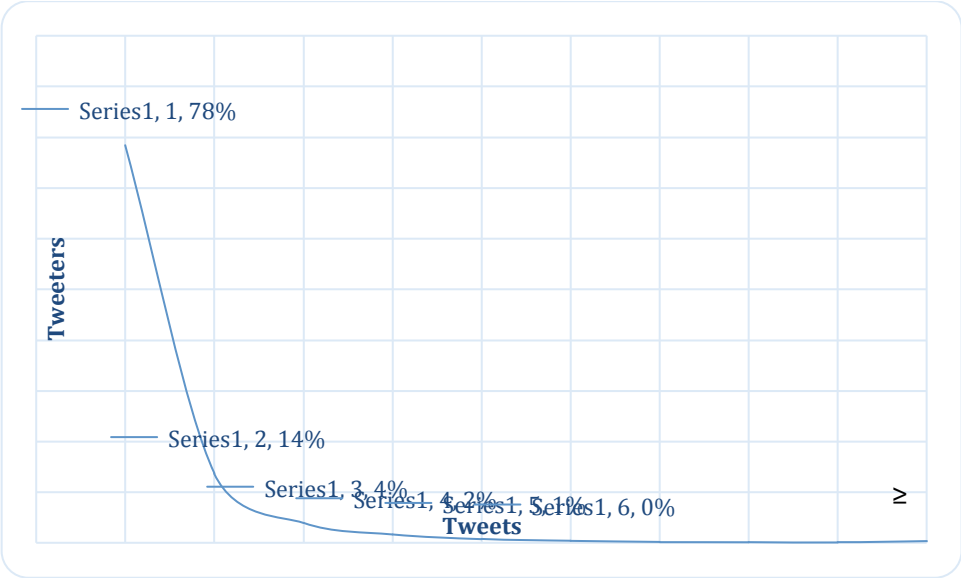
Type	Proportion	Extrapolated weekly number	Example
Serious / non-offensive	10%	2710	Slut shaming by man with history of abuse the norm. Young girls backing him up on here? I fucking despair. #cbbuk #bbbots
Colloquial / casual	35%	9486	*@XXX relpy to my texts you slut LOL* *if i was pretty and skinny would be such a whore oh my god*
Generally misogynistic	18%	4878	*Why take photos lookin like a slut and then moan when people say bad things?? You bought hate upon yourself and you know it*
Abusive	20%	5420	*@XXX @XXX You stupid ugly fucking slut I'll go to your flat and cut your fucking head off you inbred whore*
Other (inc. subversive and porn)	16%	4336	*Slut dropping in the shower to pick up the shampoo.*

Figure 6 Use of the words ‘slut’ and ‘whore’ by gender, conversation tweets



Power law analysis was conducted on the conversational data set. There were 76,673 unique users in this data set. Extensive use of these words was confined to a small minority of users: 78 per cent of users tweeted either ‘slut’ or ‘whore’ once, 14 per cent twice, 4 per cent four times. The user who produced the most tweets containing these words tweeted 415 times.

Figure 7 Power law analysis of use of the words ‘slut’ and ‘whore’ in conversation tweets

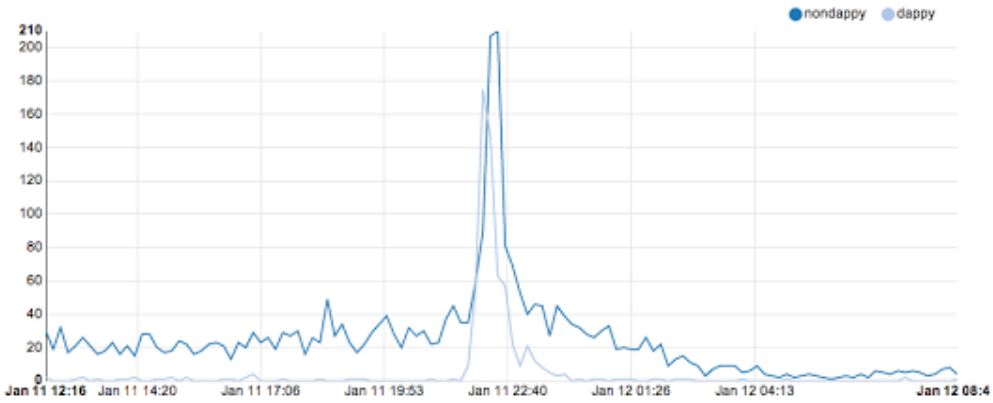


CASE STUDIES: WHAT DRIVES TRAFFIC?

Case Study 1: Celebrity Big Brother

Increases in the use of sexist language can be driven by media events related to sexism and gender discourse. For example the spike in the use of both 'slut' and 'whore' by both genders over 11 January was as a result of the contestant Dappy arguing with Luisa Zissman over the sexual promiscuity of men and woman and dual standards on *Celebrity Big Brother*.[4]

Figure 8 Tweets containing the word 'slut'

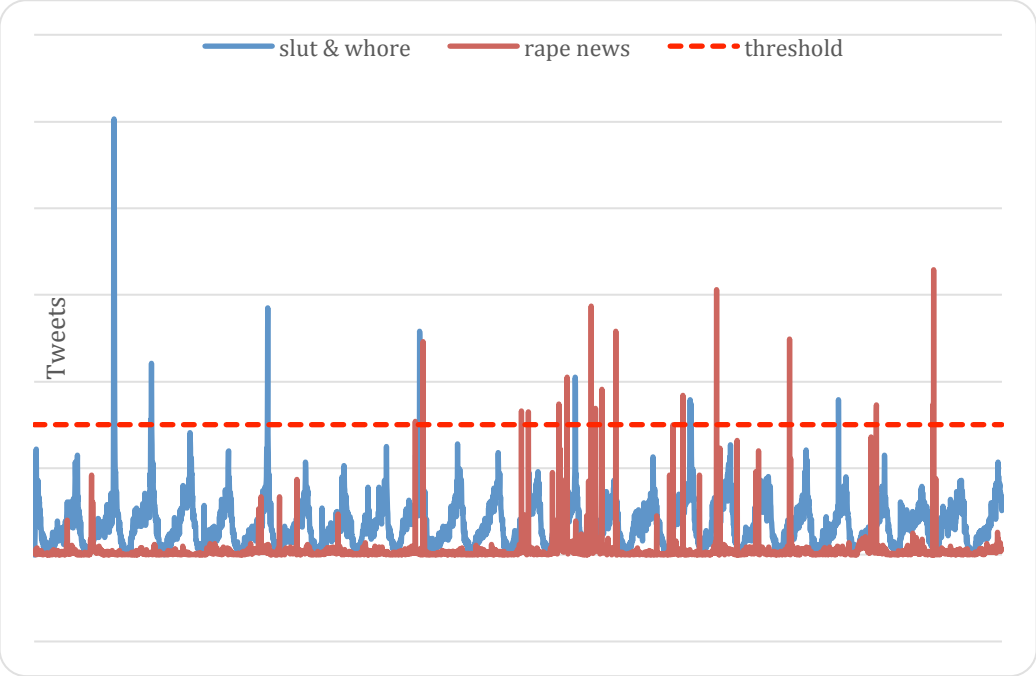


An analysis of the tweets containing the words slut and whore on January 11 showed a significant volume of tweets referring to Dappy as the *Celebrity Big Brother* argument takes place and is commented on. With almost immediate effect, discussion about the argument drives a short-term, more general increase in the use of the terms 'slut' and 'whore' on Twitter which continues for some time after the direct discussion of Dappy ends.

Case Study 2: 'Rape' news stories versus 'slut' and 'whore' conversations

Reporting of rape-related stories in the media via Twitter is greatest from 22 January onwards. This period coincides with some high profile celebrity rape trials. On 19 January, there is a spike in the number of tweets about rape in the news that is followed by a relatively large spike in tweets containing the words 'slut' or 'whore' that is followed by another surge in rape news tweets.

Figure 8 Rape reports in the media and use of the words 'slut' and 'whore'



On 23 January, there is a spike in the number of tweets referencing rape in the news that is followed not long after by an unusual number of tweets using the words 'slut' or 'whore'. Also, on 26 January, there is another example of a surge in the number of tweets making reference to rape in the news that is followed by an unusual number of tweets using 'slut' or 'whore'.

It would be tempting to conclude on this basis that stories in the media are driving use of words 'slut' and 'whore', but this conclusion is hard to sustain, as there are many examples where surges in reporting of rape on Twitter are not matched shortly after by a rise in the number of tweets with 'slut' or 'whore' in them: eg January 22, January 24, January 27, January 29, January 31, and February 2.

Thus, it may be that in certain cases, rape coverage is met with tweets using the words 'whore' and 'slut' but generally it seems that unusual use of such words is responding to other kinds of events, such as television programmes like *Celebrity Big Brother*.

TECHNICAL ANNEX

Classifiers make use of natural language programming (NLP) in order to distinguish between different types of tweets.

The performance of all the classifiers used in the project were tested by comparing the decisions that they made against a human analyst making the same decisions about the same Tweets. Classifier training involved, for each classifier, the creation of a 'gold standard' dataset containing around 200 Tweets annotated by a human into the same categories of meaning as the algorithm was designed to do. The performance of each classifier could then be assessed by comparing the decisions that it made on those 200 Tweets against the decisions made by the human analyst. There are three outcomes of this test, and each measures the ability of the classifier to make the same decisions as a human – and thus its overall performance - in a different way:

- Recall: This is number of correct selections that the classifier makes as a proportion of the total correct selections it could have made. If there were 10 relevant tweets in a dataset, and a relevancy classifier successfully picks 8 of them, it has a recall score of 80 per cent.

- Precision: This is the number of correct selections the classifiers makes as a proportion of all the selections it has made. If a relevancy classifier selects 10 tweets as relevant, and 8 of them actually are indeed relevant, it has a precision score of 80 per cent.

- Overall, or 'F': All classifiers are a trade-off between recall and precision. Classifiers with a high recall score tend to be less precise, and vice versa. 'F1' equally reconciles performance and recall to create one, overall measurement of performance for the classifier.

Generally classifiers worked well. It was only for the second classifier, distinguishing between 'comment' and 'conversation' for

the slut/whore data set that there was low scores on one of the categories. Given the strong performance of the other category in this classifier we are confident that this classifier is at least successfully classifying those uses of 'slut' and 'whore' that are conversational. Thus, anything else is likely to 'comment' regardless of its low comparison to the test data set. Low scores of precision, recall and f-score for this category probably arise from there being so few examples of 'comment' tweets.

Table 3 Precision, recall and F-score for each study

Study	Classifier		Precision	Recall	F-score
Rape	Relevancy	Relevant	0.985	1	0.992
		Irrelevant	1	0	0
	News	News	0.771	0.804	0.787
		Non-news	0.946	0.915	0.93
Slut/ whore	Relevancy	Relevant	0.887	0.931	0.909
		Irrelevant	0.656	0.525	0.583
	Usage	Comment	0.222	0.222	0.222

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NOTES

[1] Fallows, D. 'How Women and Men Use the Internet' (Pew Internet Research Project, December 2005), available at http://www.pewinternet.org/2005/12/28/how-women-and-men-use-the-internet/
[2] Robert Meyer & Michael Cukier, Assessing the Attack Threat due to IRC Channels, in Proceedings of the International Conference on Dependable Systems and Networks (2006), available at http://www.enre.umd.edu/content/rmeyer-assessing.pdf
[3] Hess, A. 'Why Women Aren't Welcome on the Internet' (Pacific Standard, January 2014), available at http://www.psmag.com/navigation/health-and-behavior/women-arent-welcome-internet-72170/#.Usq9QZi5wZA.twitter
[4] http://www.dailymail.co.uk/tvshowbiz/article-2537514/Dappy-Luisa-Zissman-foul-mouthed-battle-Celebrity-Big-Brother.html