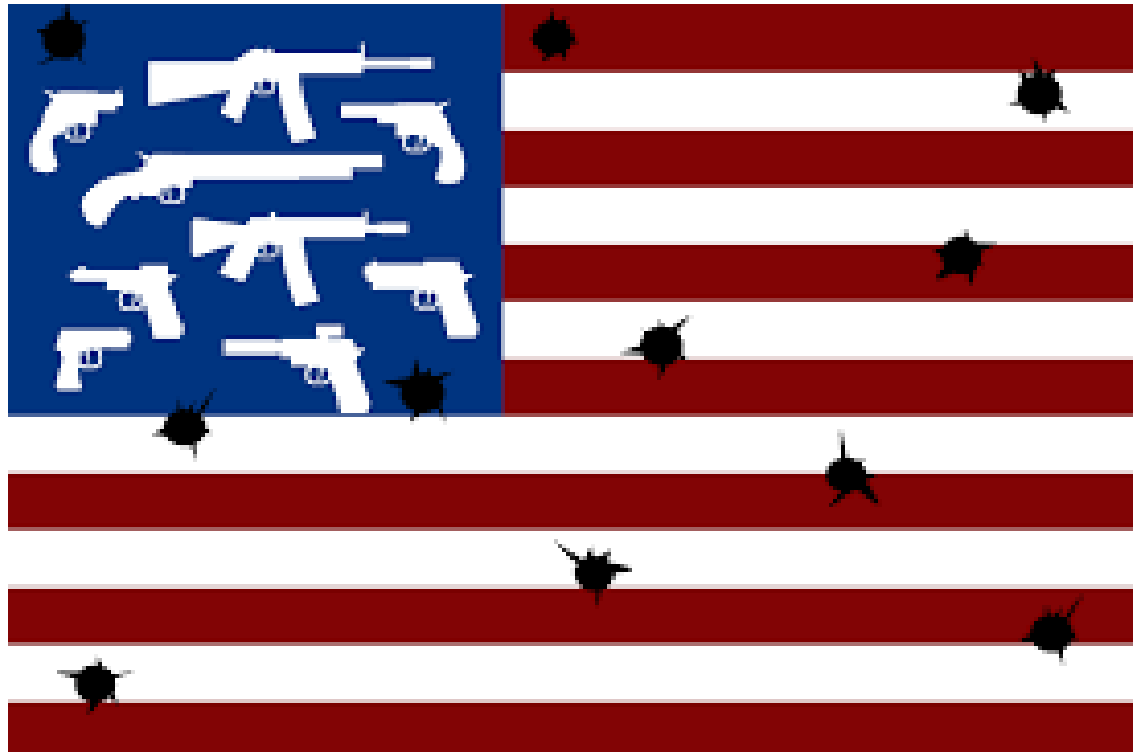


Gun Violence Discourse Within the Twittersphere

Christina Acosta, William Delmas and Sara Schneider





INTRODUCTION TO MASS SHOOTINGS

Mass Shootings

- **Mass Shooting:** Incidents occurring in relatively public places, involving four or more deaths-not including the shooter(s)-and gunmen who select victims somewhat indiscriminately. The violence in these cases is not a means to an end-the gunmen do not pursue criminal profit or kill in the name of terrorist ideologies, for example (1).
- **Mass Killing:** “A number of murders (four or more) occurring in the same incident, with no distinctive time period between the murders” (2).



1) Schildkraut, J., &Elsass, H.J. (2016). *Mass shootings: Media, myths, and realities*.

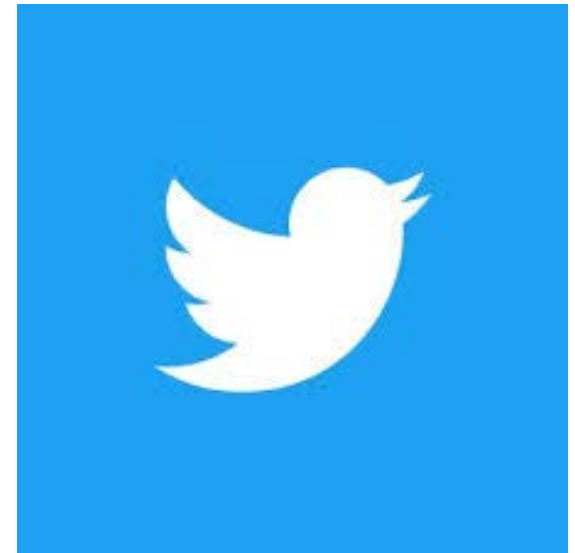
2) Morton, R.J. & Hilts, M.A. (Eds.). (2008). *Serial Murder: Multi-Disciplinary Perspectives for Investigators*. Quantico, VA: Federal Bureau of investigation.



RESEARCH QUESTION?

Research Question

- **Do people talk about mass shootings less frequently over time and does this suggest a general desensitization to mass shootings?**
- To investigate this question we looked to the Twittersphere
- Twitter is an online news and social networking service on which users post and interact with messages known as "tweets"
- Hashtags are used on tweets to label the topic of the tweet.
- Analyze use of hashtags associated with mass shootings to gather information.



Hashtag Activism



Rosie Nelson-Stanford-Thesis work:

- First article explored looked at BLM hashtags such as:
 - #HandsUpDontShoot
 - #HoodiesUp
 - #IfTheyGunnedMeDown
- “Platforms like Twitter have become important sites for activism around issues of racial inequality, state violence, and media representations”
- Twitter hashtags can be used as a means of bringing attention to issues that are not being covered by the mainstream media

Bonilla, Y., & Rosa, J. (January 01, 2015). #Ferguson: Digital protest, hashtag ethnography, and the racial politics of social media in the United States. *American Ethnologist*, 42, 1, 4-17.

Drawing from what has already been tested methodologically

Vaccine ?



Yes No



I heard that
vaccines cause
autism.



- Moise (2016) used tweet scraping to track the evolution of sentiments regarding vaccination for Ebola and Zika viruses.
- Using time as a variable of analysis allowed Moise to observe the way real-time events impacted conversations on Twitter.
- Example-New Guinea successful Ebola vaccine shifted twitter conversations from negative to positive.
- California vaccination law-Whooping cough, measles and other diseases had Twittersphere up in arms.
- Moise, I., & 2016 IEEE International Conference on Big Data (Big Data). (December 01, 2016). The technical hashtag in Twitter Data: A hadoop experience. 3519-3528.

Parkland Students Take Action

The weekend following the shooting, Florida residents flooded the Fort Lauderdale courthouse to demand gun control



Parkland Student Emma Gonzalez declared “We are going to be the last school shooting” and called “BS” on claims that stricter gun laws would not decrease mass shootings



Mass Shootings and Social Media

- “Among the 30 deadliest mass shootings in the U.S. since 1949, 16 have occurred in the past decade.”
- They wanted to know how different mass shootings triggered varying social media responses.
- They found a “bored public” lost interest in the issue after a saturation of media attention on the subject without immediate consequences to repetition of the issue (ie. more mass shootings)
- Yini, Z., Yidong, W., Jordan, F., Jiyoun, S., Devin, C., & Proceedings of the 8th International Conference/Social Media & Society (#SMSociety17). (2017). *Tweeting Mass Shootings*. ACM, 2 Penn Plaza, Suite 701, New York, NY 10121-0701 USA.



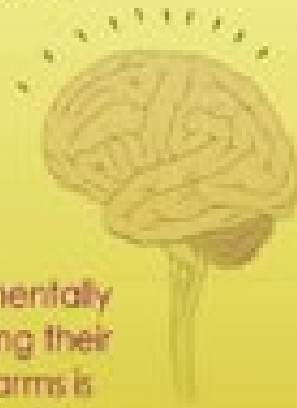
Unpacking America's Perceptions about Mass Shootings and Gun Control

Question:

What percentage of murders are committed by people with severe mental illness?

Answer:

About 4%



Treating the mentally ill and restricting their access to firearms is one necessary step. But that alone won't solve the problem of gun violence.



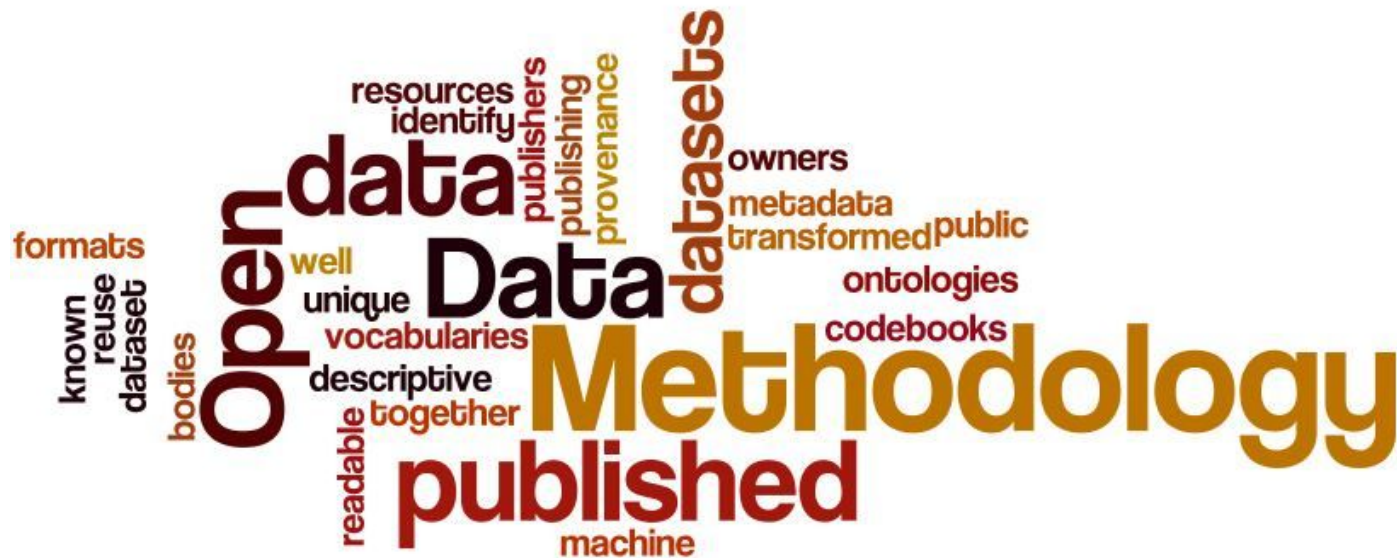
Source: <http://www.fbi.gov/newsroom/special-reports/2012/01/2012-01-10-01>
Murders, Deaths, Shootings, and Other Statistics

www.dontstandonvalues.org

Parkland

- According to the New York Times, 10 of the most deadly mass shooting in the U.S. (including Parkland with 17 people murdered by Nikolas Cruz), have taken place between October 2017 and February 2018 (5 months).
- Another NYT article reported that hundreds of thousands of students, parents and community members had marched in protest during the student organized “March for our Lives” on March 24th, 2018.
- Parkland students and supporters hashtagged #NeverAgain, and have been fighting for stricter gun laws that limit access to semi-automatic weapons such as the AR-15. Their activism ensured that the Parkland shooting would not be easily forgotten.
- <https://www.nytimes.com/2018/02/14/us/parkland-school-shooting.html>
- <https://www.nytimes.com/2018/03/24/us/march-for-our-lives.html>





METHODOLOGY

Tweet Scraping Overview

- Tweet Scraper installed from <https://github.com/jonbakerfish/TweetScraper> was utilized.
- This scraper does not use API's (application programming interfaces), so there's **no limit** on how many tweets you can scrape, and it's **free!**



Tweet Scraping Overview

- Only public tweets can (and should) be scraped, limiting the amount of all tweets we scraped per hashtag to >500k tweets (with some hashtags containing more tweets than others).
- Hashtags were not case sensitive.
- We aimed for 5 hashtags per tweet, though we didn't quite make it that far for some events.

Raw Data

H2 ✕ ✓ *fx* 4/15/2013 7:23:22 PM

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Username	Tweet ID	Text	url	Neighbor Retweet	Neighbor Favorite	Neighbor Reply	Date and Time	Includes Media	Actual Media	Reply?	Retweet?	User ID
2	MattyGBE_3	3.2398E+17	# PrayForSar	/MattyGBE_	0	0	0	#####	NAN	NAN!	FALSE	FALSE	1343437518
3	oheysunshin	3.3548E+17	# prayforsan	/oheysunshir	0	0	0	#####	NAN	NAN!	FALSE	FALSE	67934993
4	wOrstdad	3.3671E+17	# PrayForSar	/wOrstdad/s	2	1	0	#####	NAN	NAN!	FALSE	FALSE	491020624
5	wOrstdad	3.3687E+17	,Äú@_KingP	/wOrstdad/s	0	1	0	5/21/13 8:57	NAN	NAN!	FALSE	FALSE	491020624
6	XaviRodrigue	3.5059E+17	Esto es la ris	/XaviRodrigu	2	2	6	6/28/13 5:15	NAN	NAN!	FALSE	FALSE	55796690
7	geo_Sixty9	3.5811E+17	,Äú@TyhishM	/geo_Sixty9/	0	0	0	#####	NAN	NAN!	FALSE	FALSE	87849185
8	CoryJae	3.583E+17	3 bodies foui	/CoryJae/sta	1	1	0	#####	NAN	NAN!	FALSE	FALSE	32350276
9	avianacerezc	3.9068E+17	Was told frig	/avianacerez	0	1	0	#####	NAN	NAN!	FALSE	FALSE	23259935
10	avianacerezc	4.2365E+17	Today's pres	/avianacerez	0	1	0	#####	NAN	NAN!	FALSE	FALSE	23259935
11	GrindHardPe	4.5013E+17	# PrayForSar	/GrindHardP	1	1	1	#####	NAN	NAN!	FALSE	FALSE	33327359
12	GrindHardPe	4.5013E+17	It's getting	/GrindHardP	0	0	0	#####	NAN	NAN!	FALSE	FALSE	33327359
13	FoodOverBxt	4.5013E+17	,Äú@GrindH	/FoodOverBx	1	2	0	#####	NAN	NAN!	TRUE	FALSE	417406956
14	FoodOverBxt	4.5582E+17	12th homicid	/FoodOverBx	3	4	0	#####	NAN	NAN!	FALSE	FALSE	417406956
15	WhisperMike	4.5584E+17	"@FoodOver	/WhisperMik	1	1	0	#####	NAN	NAN!	FALSE	FALSE	92217904
16	blackandnotr	4.8804E+17	# prayforsan	/blackandnot	5	1	0	#####	NAN	NAN!	FALSE	FALSE	1674124446
17	RAZIQRauf	4.9733E+17	# PrayForSar	/RAZIQRauf	0	1	0	8/7/14 3:47	NAN	NAN!	FALSE	FALSE	701233
18	SirRonniee	6.7214E+17	# PrayForSar	/SirRonniee/	0	2	0	#####	NAN	NAN!	FALSE	FALSE	167979981
19	compa_brea	6.7214E+17	# prayforsan	/compa_brea	2	4	0	#####	NAN	NAN!	FALSE	FALSE	3486156314
20	The937Nerd	6.7214E+17	# PrayForSar	/The937Nerc	0	0	0	#####	NAN	NAN!	FALSE	FALSE	1691169912
21	phanek	6.7214E+17	# PrayForSar	/phanek/stat	0	0	0	#####	NAN	NAN!	FALSE	FALSE	312162035
22	Cenation818	6.7214E+17	# prayforsan	/Cenation818	0	0	0	#####	NAN	NAN!	FALSE	FALSE	70284834
23	s_beliveau	6.7214E+17	# PrayForSar	/s_beliveau/	1	1	0	#####	NAN	NAN!	FALSE	FALSE	2153495505
24	christa_sass	6.7214E+17	</3 these inc	/christa_sass	0	1	0	#####	NAN	NAN!	FALSE	FALSE	4425915571
25	DanielAshley	6.7214E+17	# InGrandpas	/DanielAshle	0	0	0	#####	NAN	NAN!	TRUE	FALSE	631360495
26	Ryan_Fraz25	6.7214E+17	Why can't w	/Ryan_Fraz2	0	1	0	#####	NAN	NAN!	FALSE	FALSE	44815274
27	LALeeALvin	6.7214E+17	# PrayforSan	/LALeeALvin,	0	0	0	#####	NAN	NAN!	FALSE	FALSE	165179794
28	iTankid	6.7214E+17	Another	/iTankid/stat	1	6	0	#####	NAN	NAN!	FALSE	FALSE	59451111
29	erinshorosky	6.7214E+17	I see humans	/erinshorosk	2	4	0	#####	NAN	NAN!	FALSE	FALSE	129986293
30	MatthewJBo	6.7214E+17	# PrayForSar	/MatthewJB	0	1	0	#####	NAN	NAN!	FALSE	FALSE	91256592
31	kateswenser	6.7214E+17	# prayforsan	/kateswense	0	0	0	#####	NAN	NAN!	FALSE	FALSE	1416800226
32	DarrenPollen	6.7214E+17	# PrayForSar	/DarrenPolle	0	0	0	#####	NAN	NAN!	FALSE	FALSE	1163568667
33	bulldogbabe	6.7214E+17	when is this	/bulldogbabe	0	1	0	#####	NAN	NAN!	FALSE	FALSE	1475413724

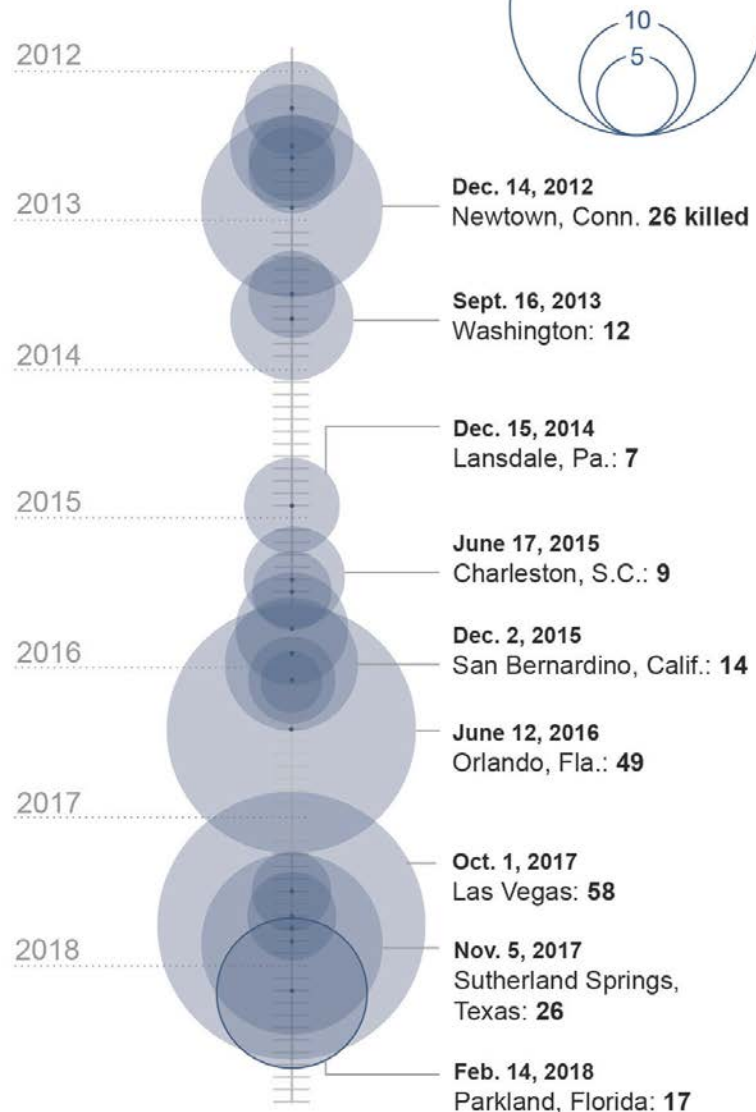
◀ ▶ #PrayforSanBernardino +

Hashtag Criteria

- The most recent 10 shootings with 8+ fatalities were analyzed.
- We aimed for 5 hashtags per shooting, and ended up with 3-5 hashtags due to time constraints.
- We began using hashtags about hurricanes as a control condition, but later realized celebrity deaths were a more analogous control due to their unexpected nature.
- Each hashtag was analyzed for one month following each shooting to lessen the confound of other topics in relation to the same hashtags.

Mass shootings

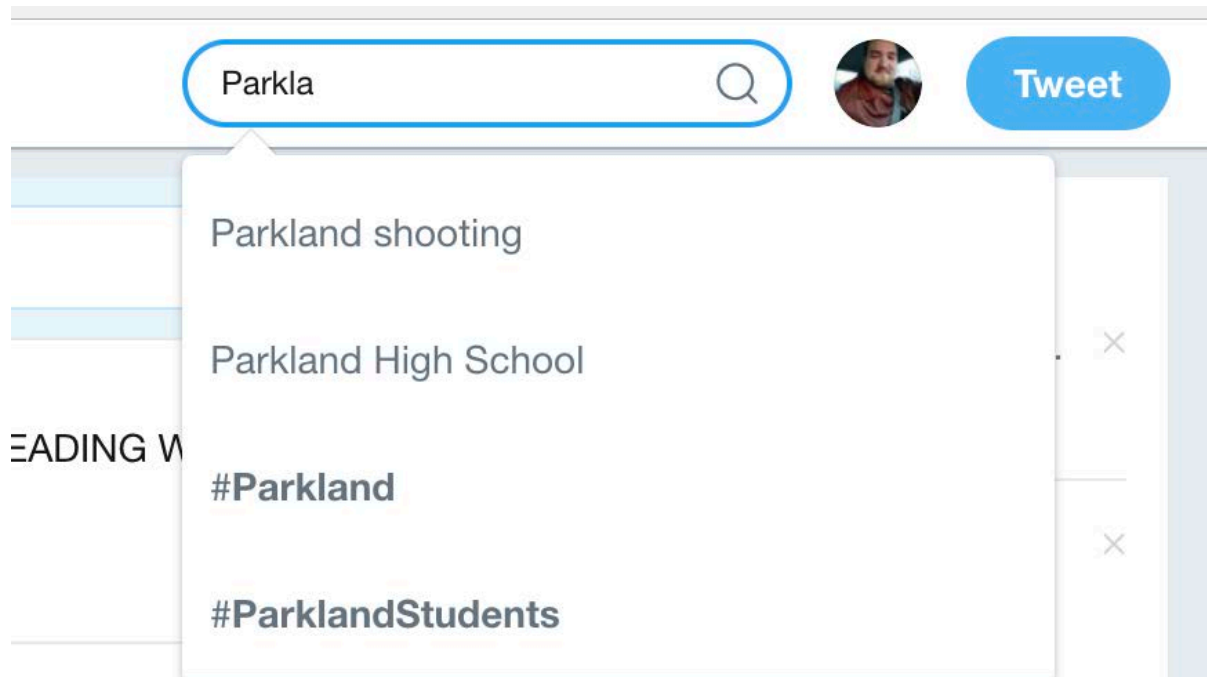
Major gun killings in the U.S. since 2012:



SOURCES: AP reports; Gun Violence Archive

Hashtag Selection

- Hashtags were first chosen by typing the event into the search engine on Twitter, which gives a Google-like list of the most popular hashtags for what is entered.



- Hashtags were next chosen by typing the event followed by 'hashtags' into Google (i.e. Sandy Hook hashtags) and also by manually flipping through the tweets used for other related and popular hashtags.

Hashtag Selection

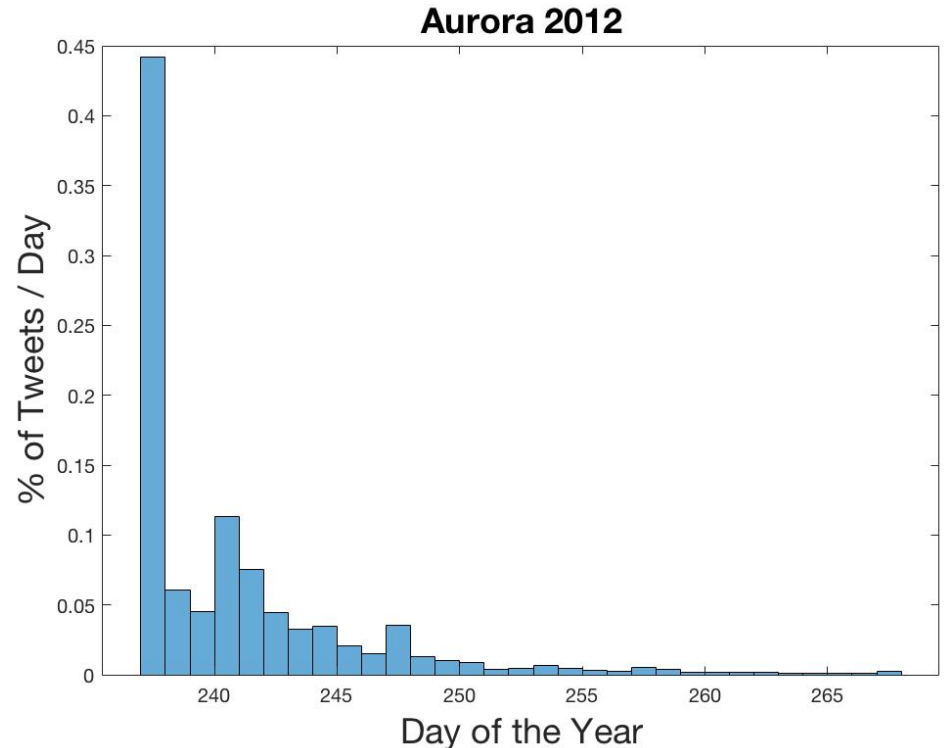
- If a hashtag had surprisingly few tweets (>5000), a few other hashtags were tested out in an effort to find the most popular hashtags. The most frequently used hashtags were selected.
- In general, the **location** of the shooting (i.e. #Aurora) and the **shooter's name** (i.e. #JamesHolmes) were used as popular hashtags, which we tended to incorporate with few exceptions (we're not finished scraping yet – this will eventually be consistent across events).



RESULTS

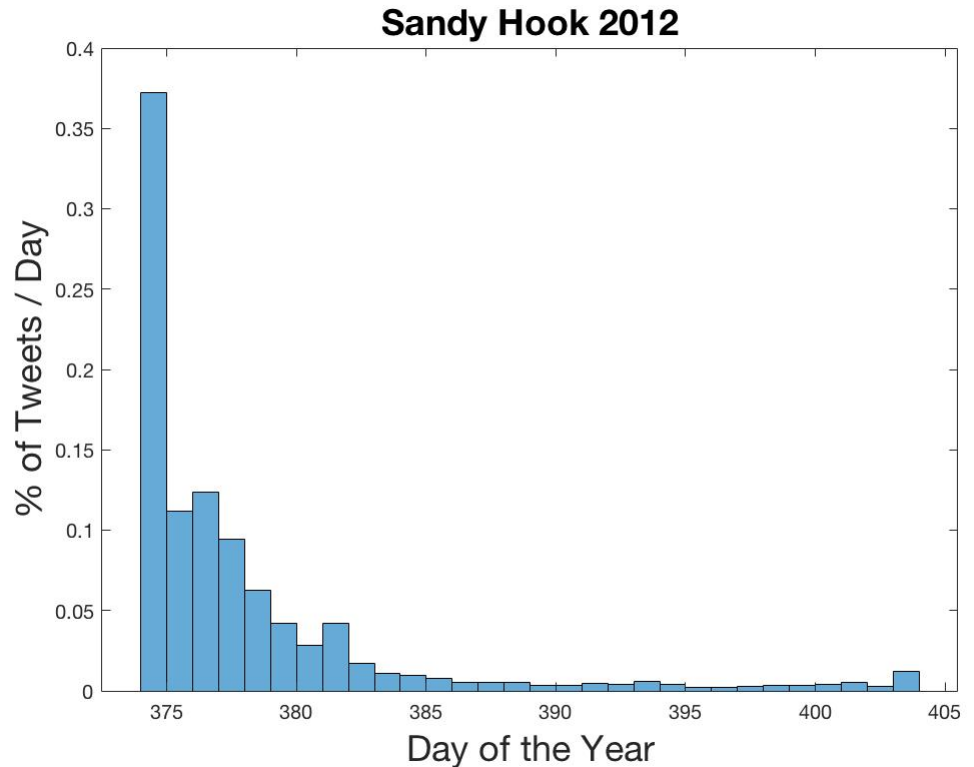
Aurora Shooting (2012)

- Date: July 20th 2012
- Classification: Movie Theater / Public Place
- #Dead: 12
- #Injured: 58
- Hashtags Used:
 - #Aurora
 - #AuroraShooting
 - #AuroraTheaterShooting
 - #TheaterShooting
 - JamesHolmes



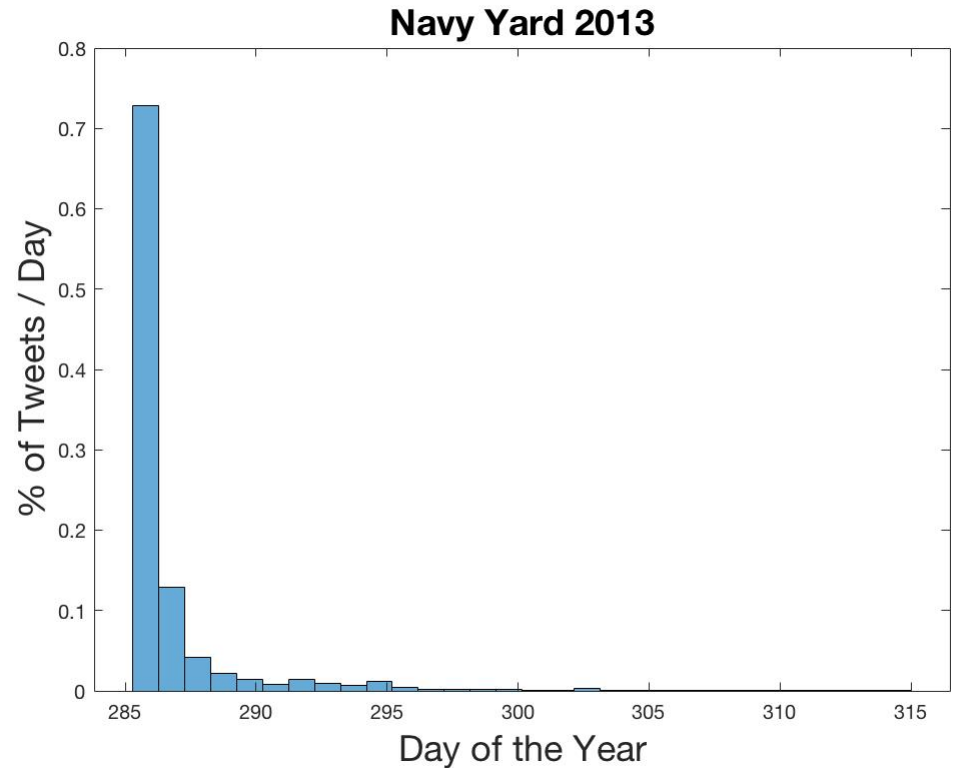
Sandy Hook (2012)

- Date: December 14th 2012
- Classification: School
- #Dead: 28
- #Injured: 2
- Hashtags:
 - #SandyHook
 - #Newtown
 - #CTShooting



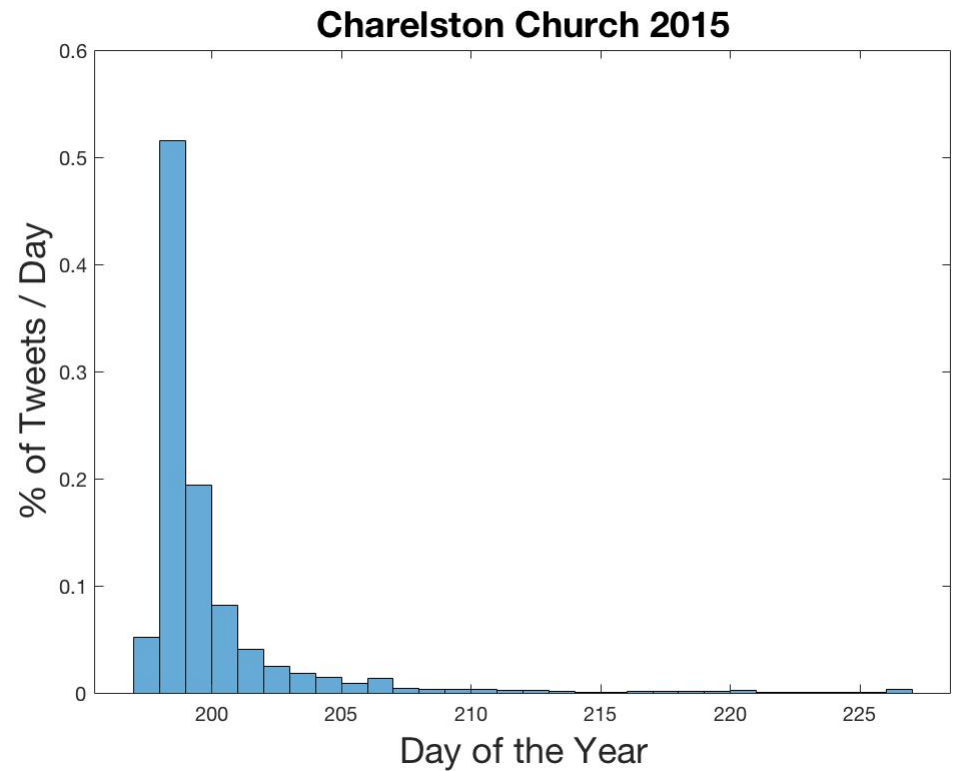
Washington Navy Yard Shooting (2013)

- Date: September 16th, 2013
- Classification: Military
- #Dead: 13
- #Injured: 8
- Hashtags:
 - #NavyYard
 - #NavyYardShooting
 - #PrayforDC



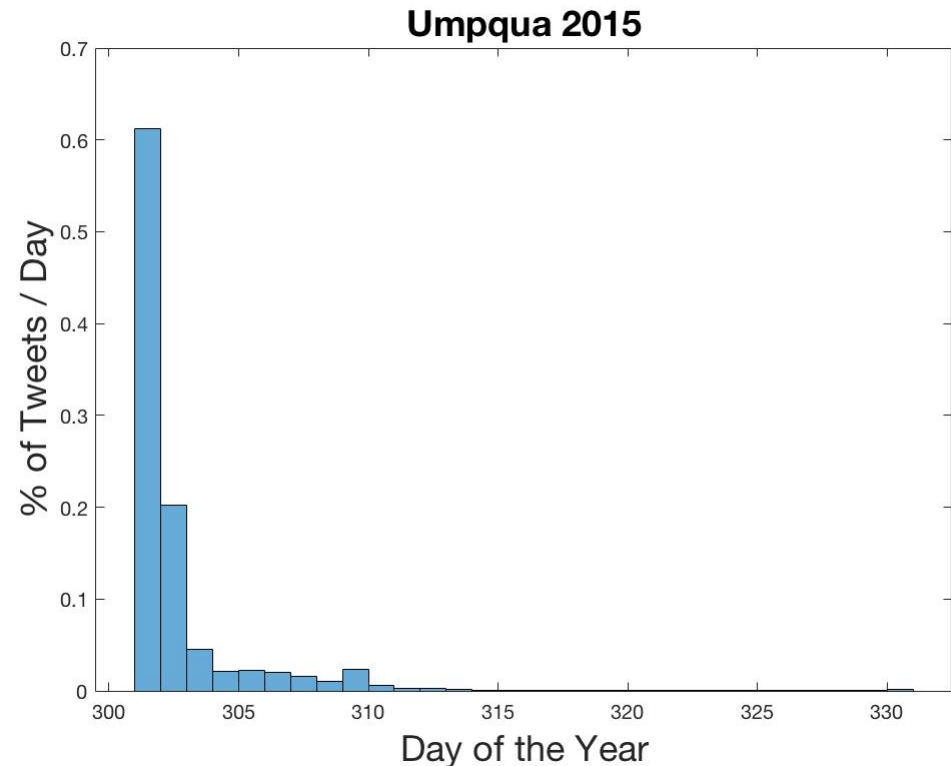
Charleston Church Shooting (2015)

- Date: June 17th 2015
- Classification: Church
- #Dead: 9
- #Injured: 1
- Hashtags:
 - #CharlestonShooting
 - #DylannRoof
 - #AMEShooting



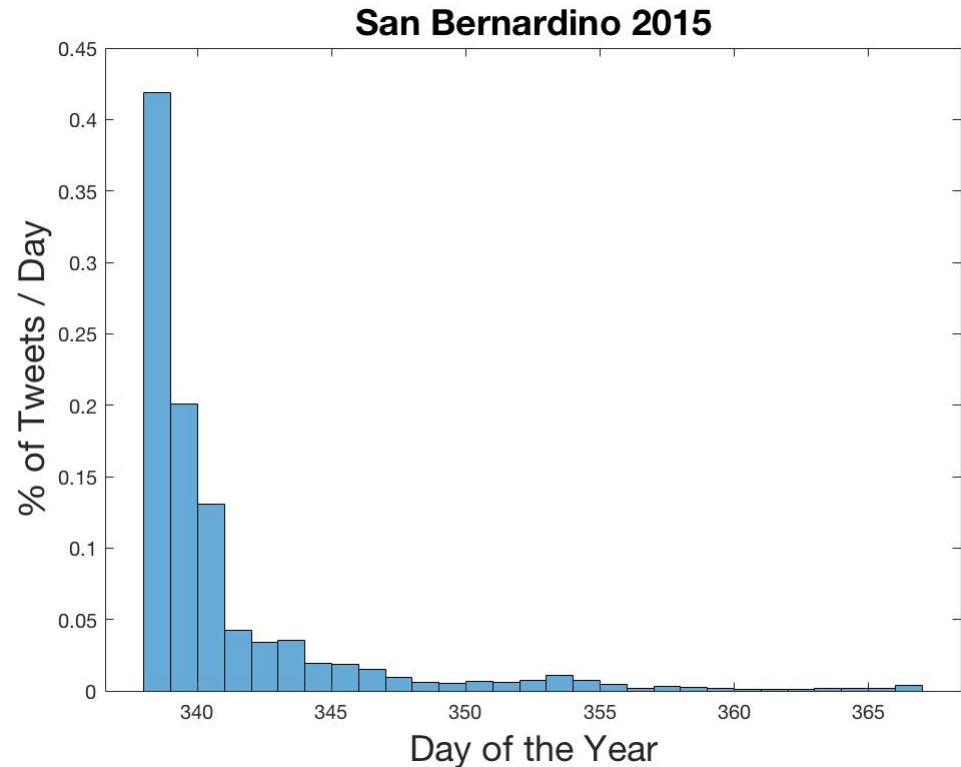
Umpqua Community College Shooting (2015)

- Date: October 1st 2015
- Classification: School
- #Dead: 10
- #Injured: 8
- Hashtags:
 - #Umpqua
 - #UmpquaShooting
 - #Roseburg
 - #UCCShooting
 - #ChrisHarperMercer



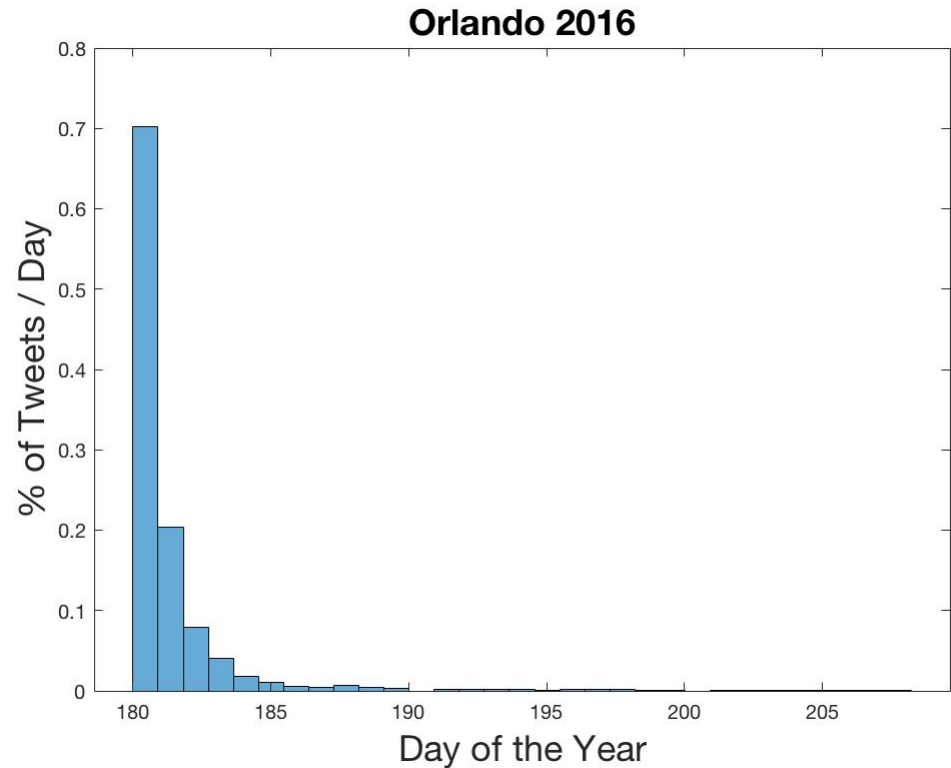
San Bernardino Shooting (2015)

- Date: December 2nd 2015
- Classification: Workplace
- #Dead: 16
- #Injured: 24
- Hashtags:
 - #SanBernardino
 - #SanBernadino
 - #SanBernardinoShooting
 - #PrayforSanBernardino
 - #TashfeenMalik



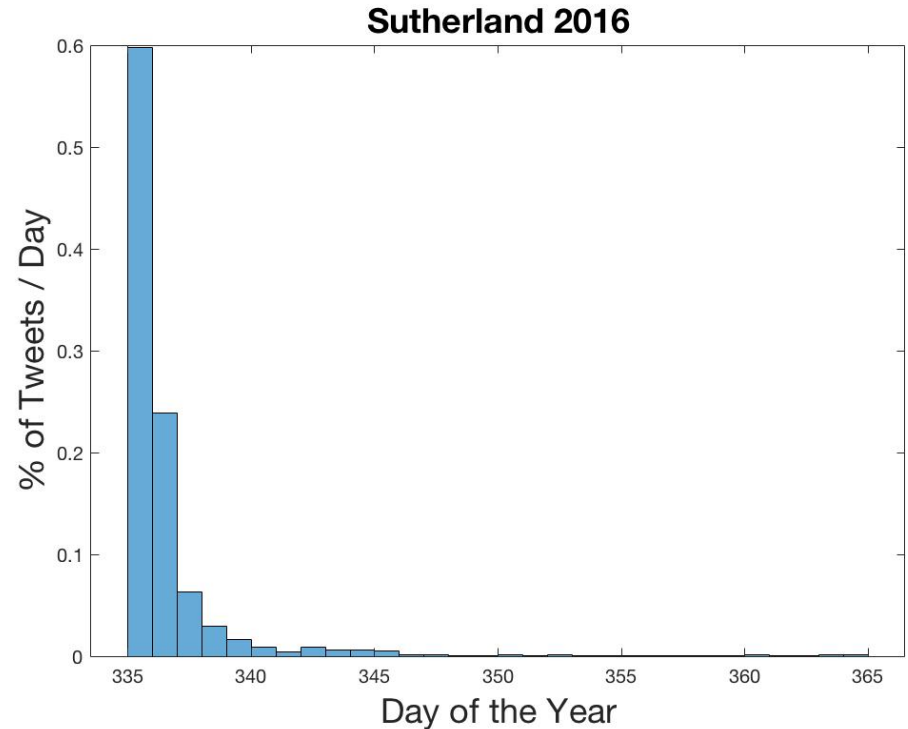
Orlando Nightclub Shooting (2016)

- Date: June 12th 2016
- Classification: Nightclub / Public Place
- #Dead: 50
- #Injured: 53
- Hashtags:
 - #PulseNightClub
 - #PulseShooting
 - #OrlandoShooting
 - #PrayforOrlando
 - #OmarMateen



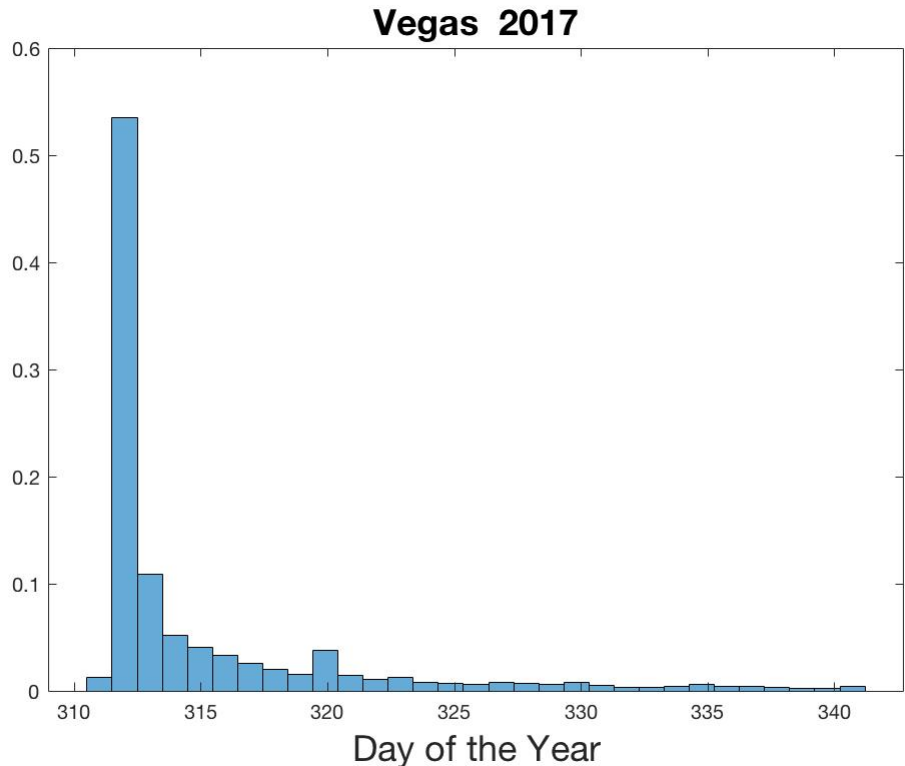
Sutherland Springs Church Shooting (2017)

- Date: November 5th 2017
- Classification: Church
- #Dead: 27
- #Injured: 20
- Hashtags:
 - #SutherlandSprings
 - #SutherlandSpringsShooting
 - #TexasChurchShooting



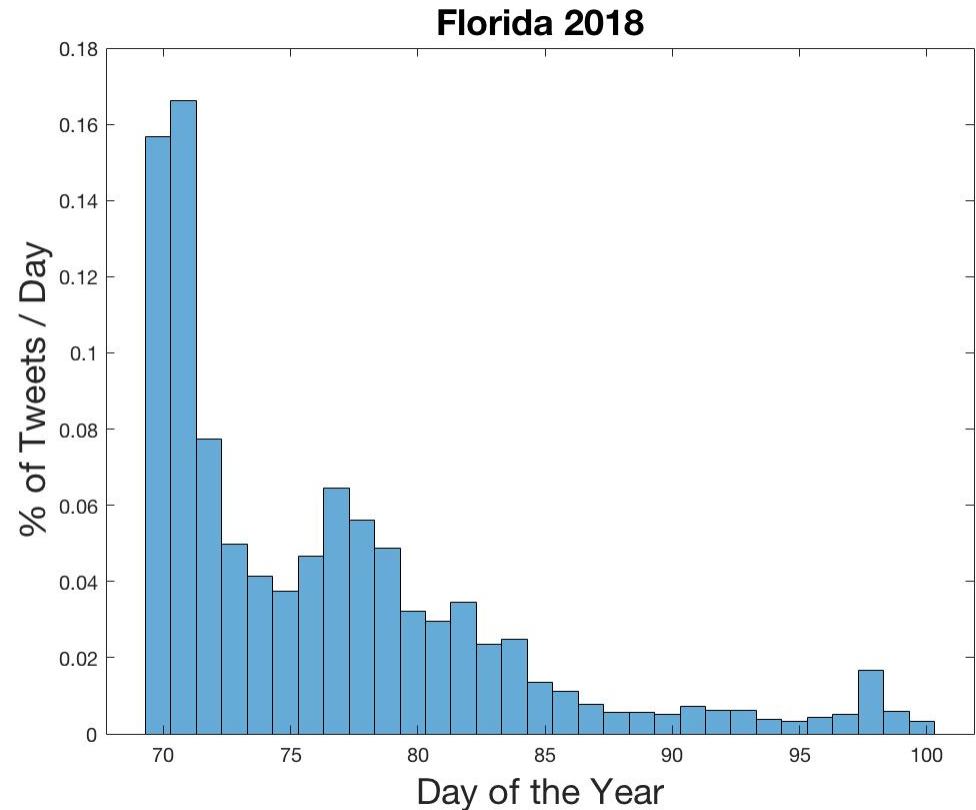
Las Vegas Shooting (2017)

- Date: October 1st 2017
- Classification: Concert / Public Place
- #Dead: 59
- #Injured: 851
- Hashtags:
 - #LasVegasShooting
 - #VegasShooting
 - #VegasStrong
 - #PrayforVegas
 - #StephenPaddock



Stoneman Douglas High School Shooting (2018)

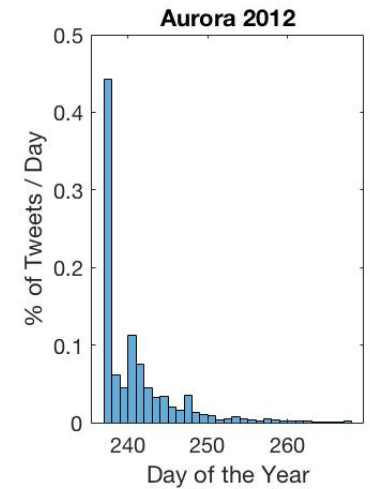
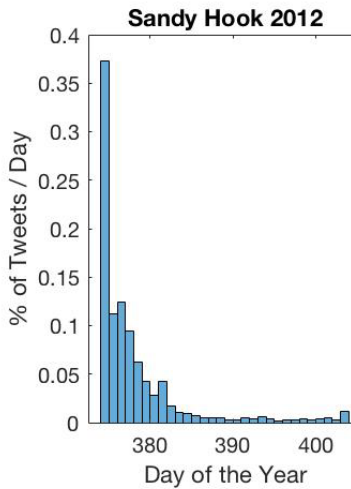
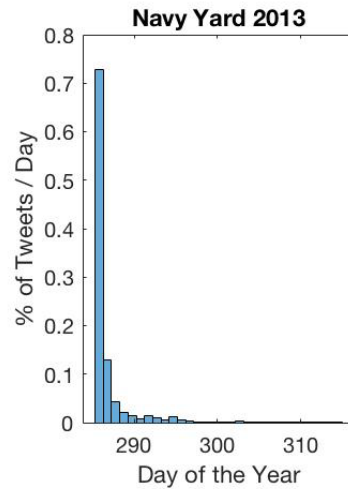
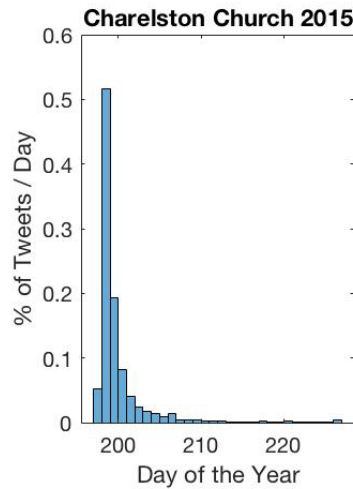
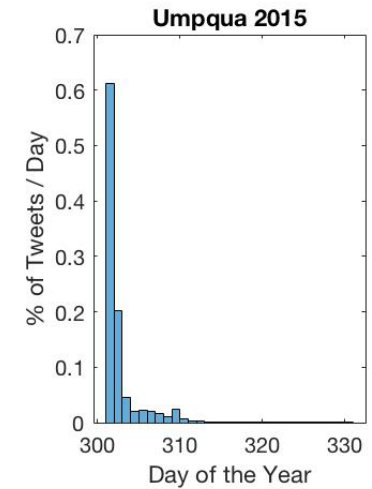
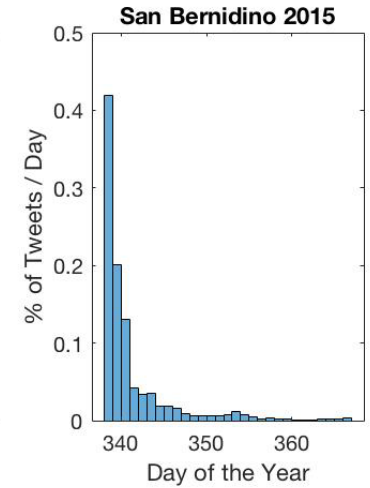
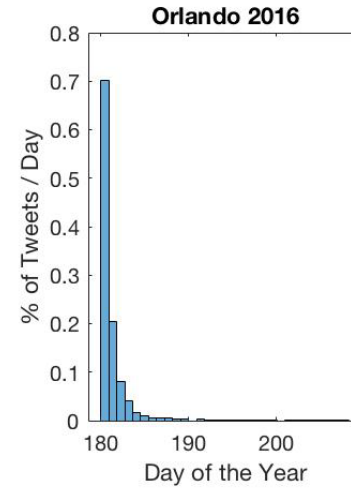
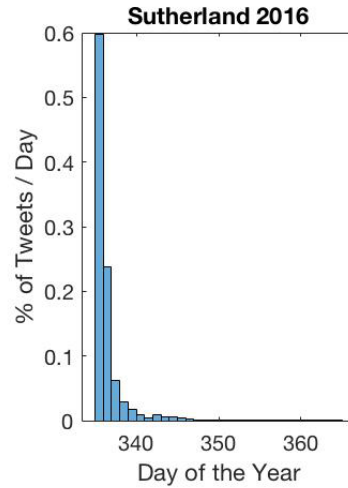
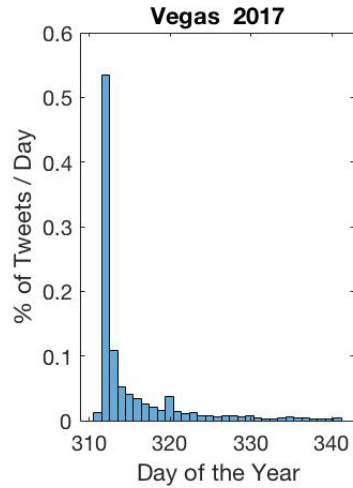
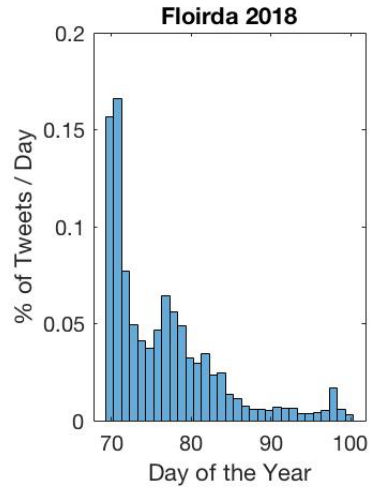
- Date: February 14th 2018
- Classification: School
- #Dead: 17
- #Injured: 17
- Hashtags:
 - #Parkland
 - #ParklandShooting
 - #FloridaSchoolShooting
 - #FloridaShooter
 - #NikolasCruz



Number of Tweets

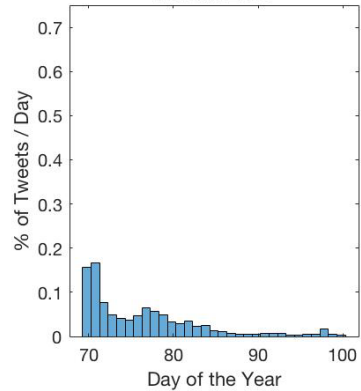
Shooting	Year	Tweet Total	# Dead	# Injured	Clasification
FS	2018	365,000	17	17	School
VS	2017	392,000	58	851	Concert
SU	2016.5	55,000	27	20	Church
OS	2016	580,000	49	50	Nightclub
SB	2015.6	131,000	16	24	Workplace
US	2015.3	123,000	10	8	School
CS	2015	354,000	9	1	Church
NY	2013	95,000	13	8	Navy Yard
SH	2012.5	518,000	32	17	School
AS	2012	17,000	12	70	Movie theater

Probability Distribution Functions

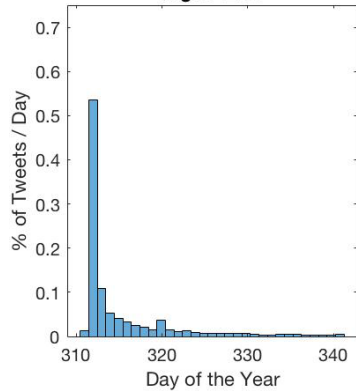


Probability Distribution Functions (Y-Axis Normalized)

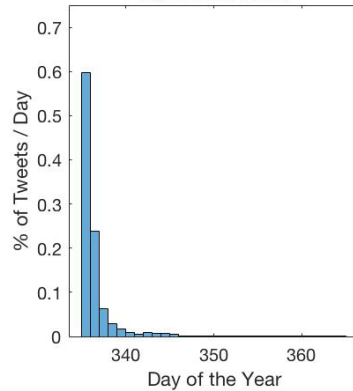
Florida 2018



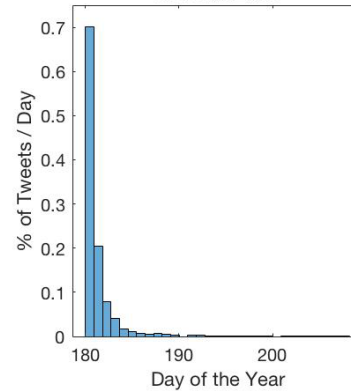
Vegas 2017



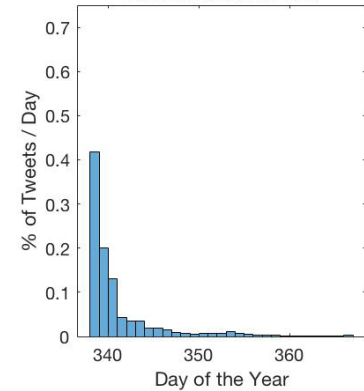
Sutherland 2016



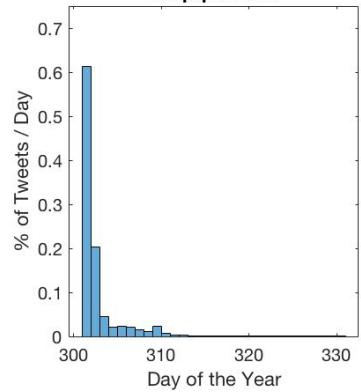
Orlando 2016



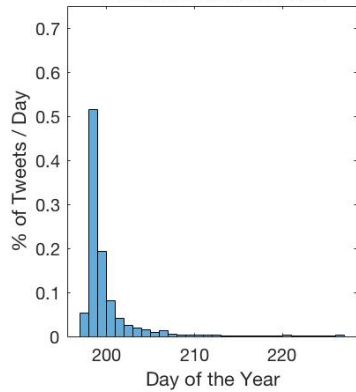
San Bernardino 2015



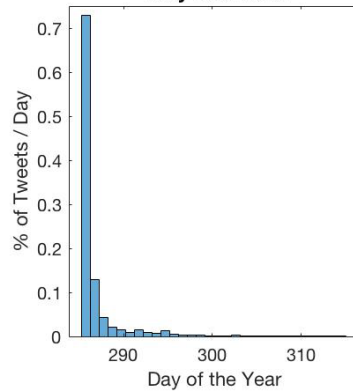
Umpqua 2015



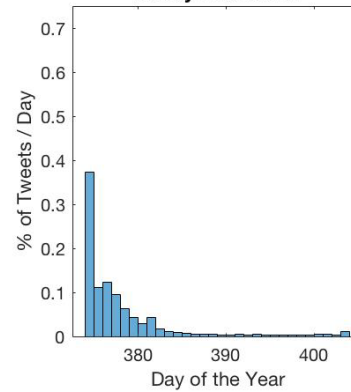
Charelston Church 2015



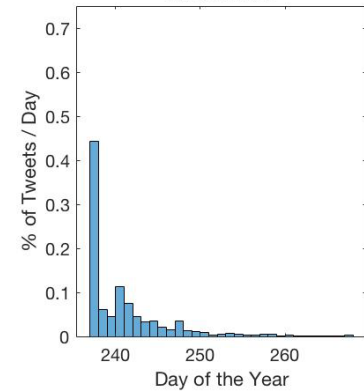
Navy Yard 2013



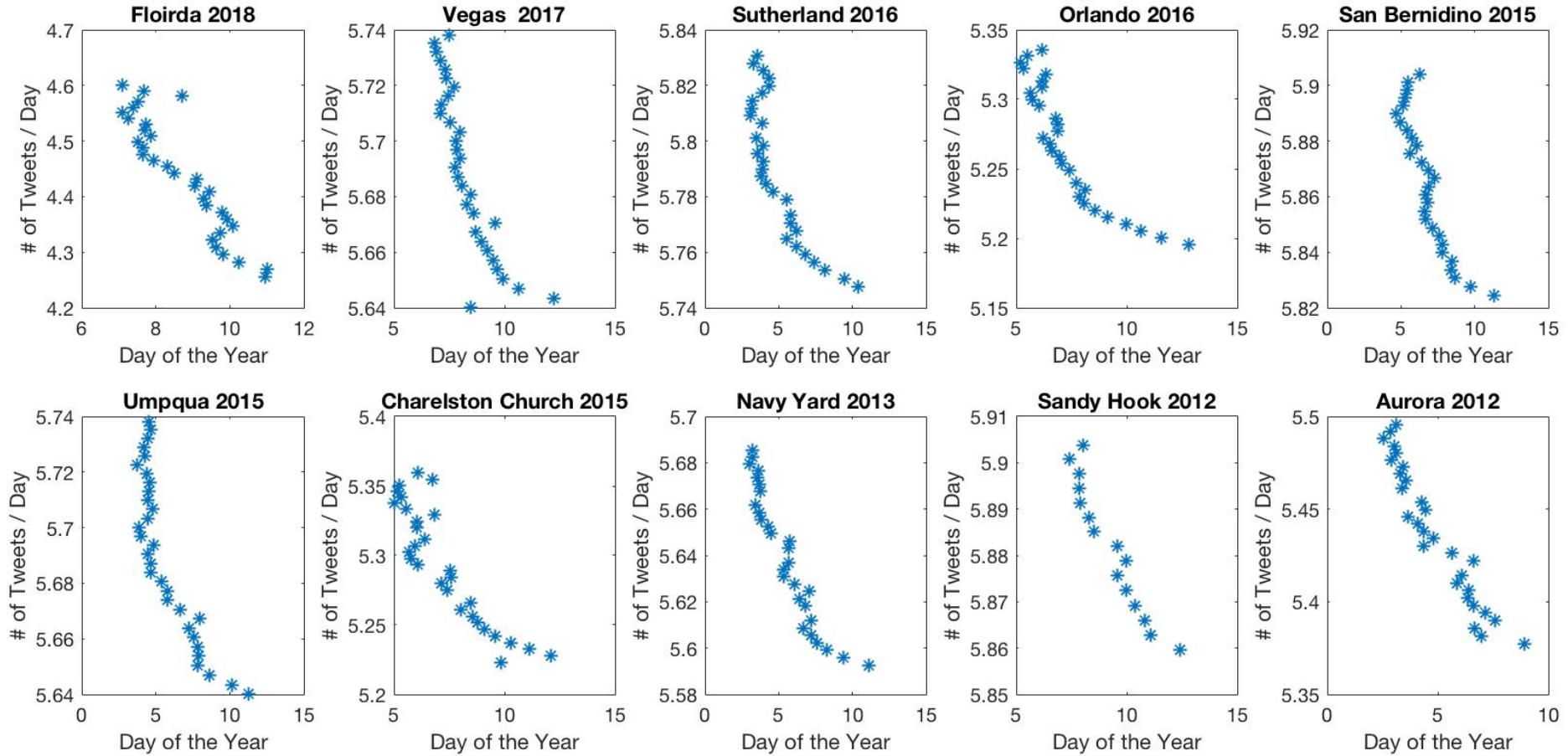
Sandy Hook 2012



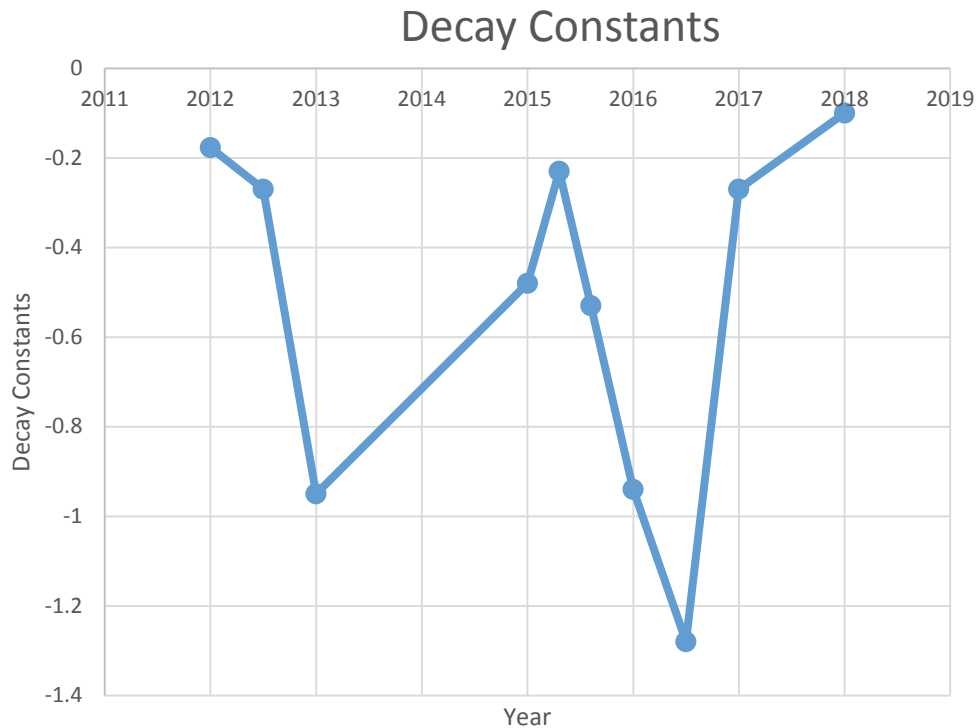
Aurora 2012



Log Plots



Decay Constants

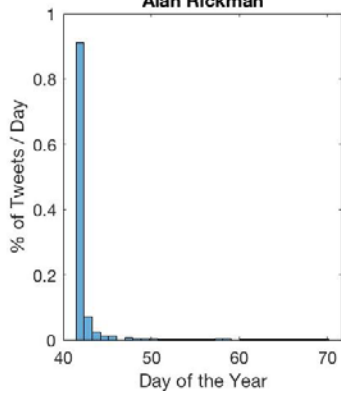


Shooting	Year	Decay Constant	R ²	Classification
FS	2018	-0.1	0.77	School
VS	2017	-0.27	0.86	Concert
SU	2016.5	-1.28	0.99	Church
OS	2016	-0.94	0.99	Nightclub
SB	2015.6	-0.53	0.89	Workplace
US	2015.3	-0.23	0.88	School
CS	2015	-0.48	0.96	Church
NY	2013	-0.95	0.96	Navy Yard
SH	2012.5	-0.27	0.97	School
AS	2012	-0.177	0.77	Movie theater

Celebrity (PDF's)



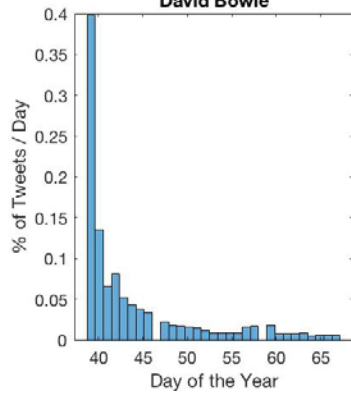
Alan Rickman



#AlanRickman



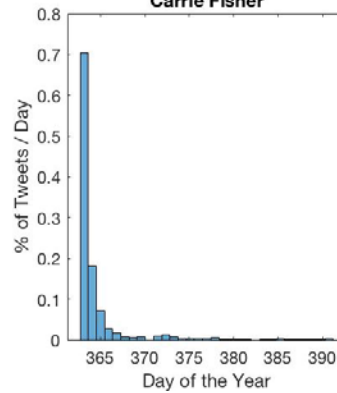
David Bowie



#Bowie



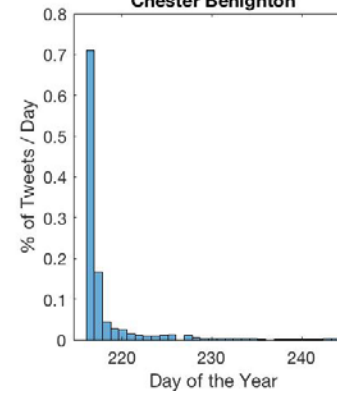
Carrie Fisher



#CarrieFisher



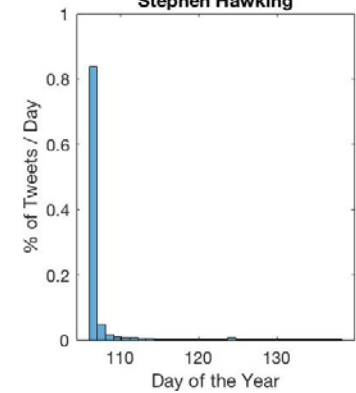
Chester Bennington



#ChesterBennington



Stephen Hawking



#StephenHawking

Person	Decay Constant	R ²	Tweet Total
Alan Rickman	-0.977	0.96	164,000
David Bowie	-0.24	0.88	102,000
Carrie Fisher	-0.99	0.98	194,000
Chester Bennington	-1.08	0.94	100,000
Stephen Hawking	-2.55	0.998	203,000

Other Analyses

Summary of Traffic Feb 24-March 24



#parklandshooting #floridashooting #floridaschoolshooting

- Similar analysis was done for us by our collaborator Karl Lieber at HP
- The data he collected looks similar to the data we scraped

Making
Conclusions
about our Learning



CONCLUSIONS

Two Main Takeaways

1. The discourse surrounding school shootings is consistently longer than other types of shootings.
2. Discourse surrounding the Parkland shooting has a distinct difference from other shootings.
 - This difference can still be seen in the March For Our Lives movement.

