

# AO3 Social Network Analysis

It's about the italic *oh*

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Repo: [GitHub](#)



# Fandom



# What is Fandom?

A **fandom** is a subculture composed of **fans** characterized by a **feeling of empathy and camaraderie** with others who share a **common interest**.

Fandoms are prevalent and **active communities that primarily function online**.

Fandoms can originate from anything, from Minecraft Youtubers to fandom itself.

- Examples: Harry Potter, Marvel, Lord of the Rings, Minecraft, etc.

There are different levels of fandom involvement:

- Consumes canon content and enjoys it.
- Consumes canon content as well as fan-created content.
- Creates fan-content.



# Why Should we Analyze Fandom?

- Fandoms are **influential**  
For example, just this past year the BTS fandom, Army, was able to raise 1 million dollars for the Black Lives Matter movement within 24 hours.
- This strength of community is fascinating from both **psychological** and **marketing perspective**
- Understanding how fandoms originate and evolve and influence a piece of media can help create long-lasting **content** that **satisfies** both fans and **creators**



# What within Fandom Should we Analyze?

Most research only considers personal-psychological reasoning, which while being a valid approach, does not consider everything such as *fandom being a social network*.

One prolific aspect of fandom communities - particularly ones surrounding pieces of media - is the *creation and consumption of fanfiction*.

We are lacking an understanding of how *fans interact with each other through fanfiction* and are not able to gain a well-rounded understanding of fandom as a whole.



# How can we Analyze Fandom?

- Analyze fanfiction data and apply *social network analysis*, *data analysis*, and *reasoning from social science* - in particular, marketing and psychology.
- Look at fanfiction as a source of interaction within the fandom community.
- Carry out general data analysis as well as social network analysis, specifically, look at **connections/relationships between stories** (nodes).
- Find closely **related fandoms**. Our data analysis will give us some general fandom statistics that will help us support our findings.



# What Results are we Wanting?

We want to find commonalities within a user's tastes/find commonality between stories a user has bookmarked.

- *If someone likes one fandom, what is the probability they will like a different fandom?*

What are the most popular aspects of fanfiction within fandoms?

# Data



# Overview of Data

We have data on:

**Categories** of fics within Archive of Our Own (AO3).

36 **Fandoms**, within these fandoms we have information on:

- The **total number of works**.
- General statistics:
  - Ratings, Warnings, Categories, Fandoms, Characters, Relationships, Freeforms.
- Top Fic (by Bookmarks)
  - Fic Name, Fic Fandoms, Author

**Users** who have bookmarked the top-fic within the 36 Fandoms

**Bookmarks** of the users who bookmarked the top-fic.



# The Process of Getting the Data

To get the data we used **Python** and the following libraries:

- **Scrapy**
- **Selenium**

We developed multiple scrapy spiders to get the data from and interact with AO3.

Initially, we were going to get more data/fandoms, however, it was above my computer's processing power to get data on more than 50000 fandoms.

# Analysis



# Initial Data Analysis

Let's take a look at the fandom-wide statistics. Specifically let's look at:

- Total works by Fandom
- Ratings Across Fandoms
- Warnings Across Fandoms
- Categories Across Fandoms
- Crossovers
- Freeform Tags Across Fandoms

# Total Number of Fics in Top Fandoms

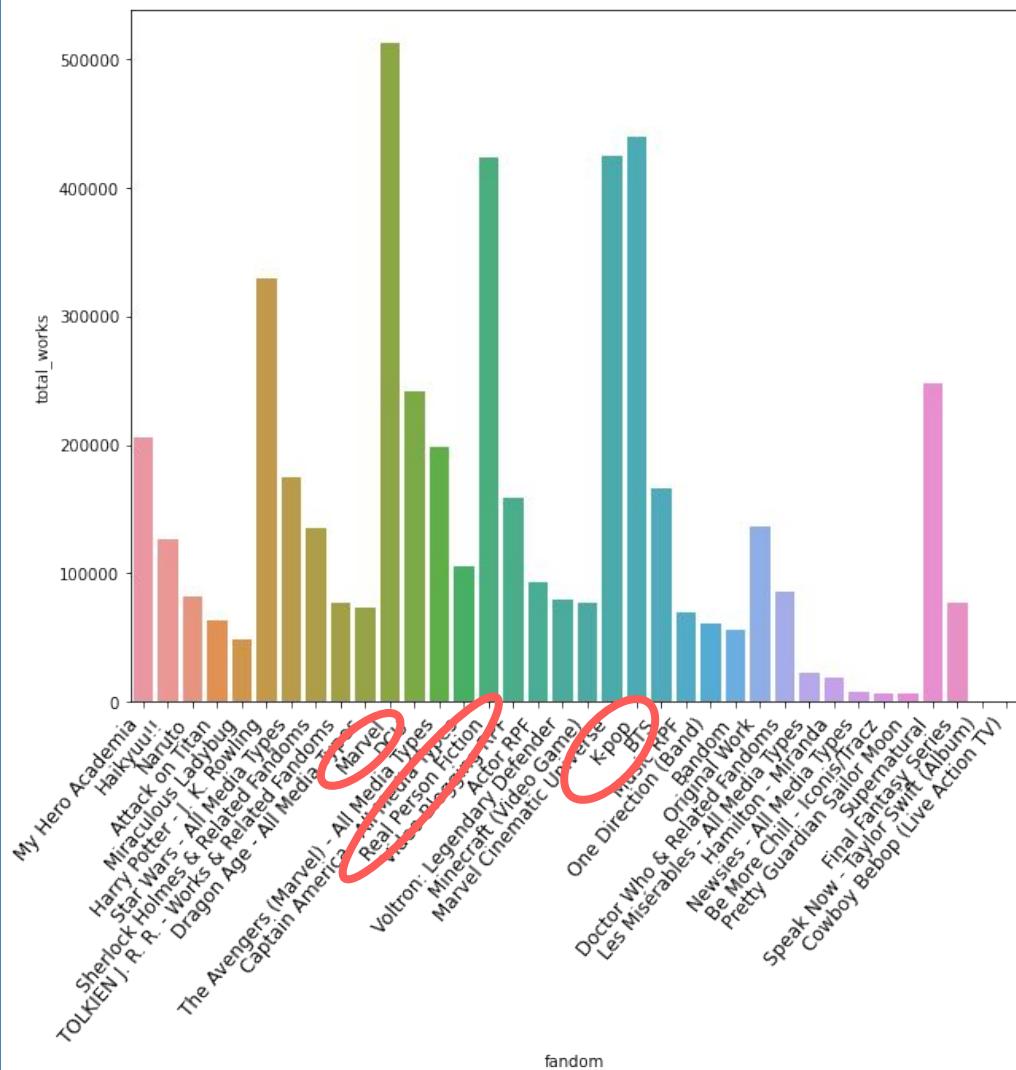
Scraped each of the top fandoms in each of AO3 categories.

Top fandoms across all categories:

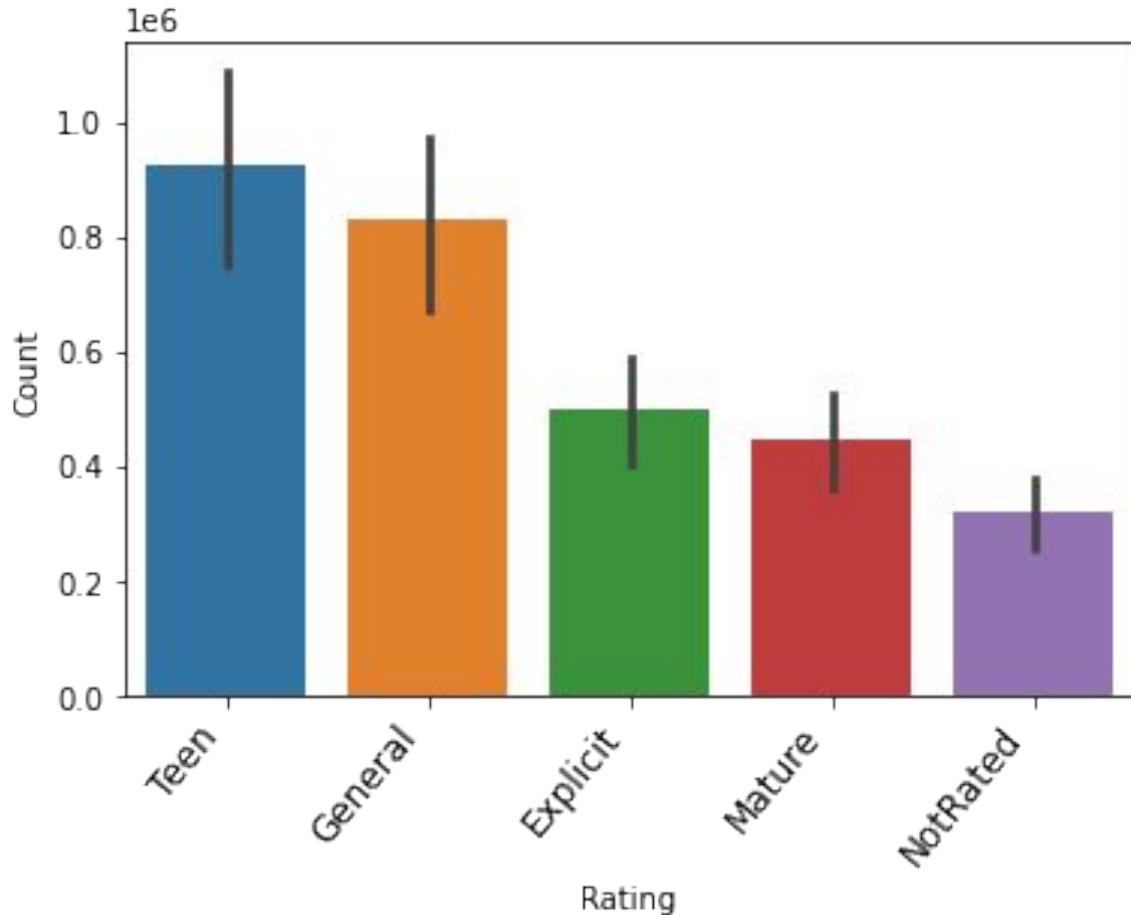
Marvel

Real Person Fiction (RPF)

K-Pop



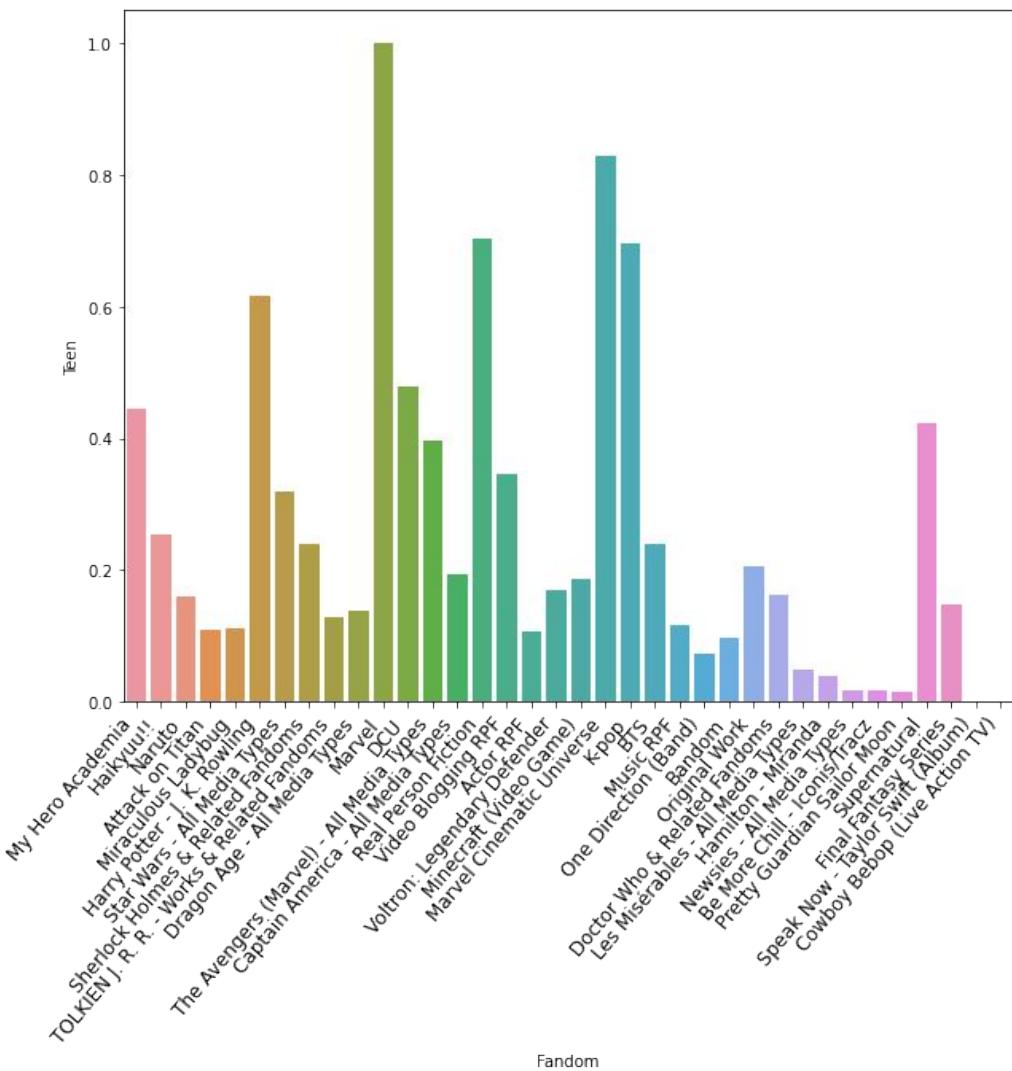
# Distribution of Ratings



Ratings measure the intensity of a work's content and give users an idea of the suitability of the work for them

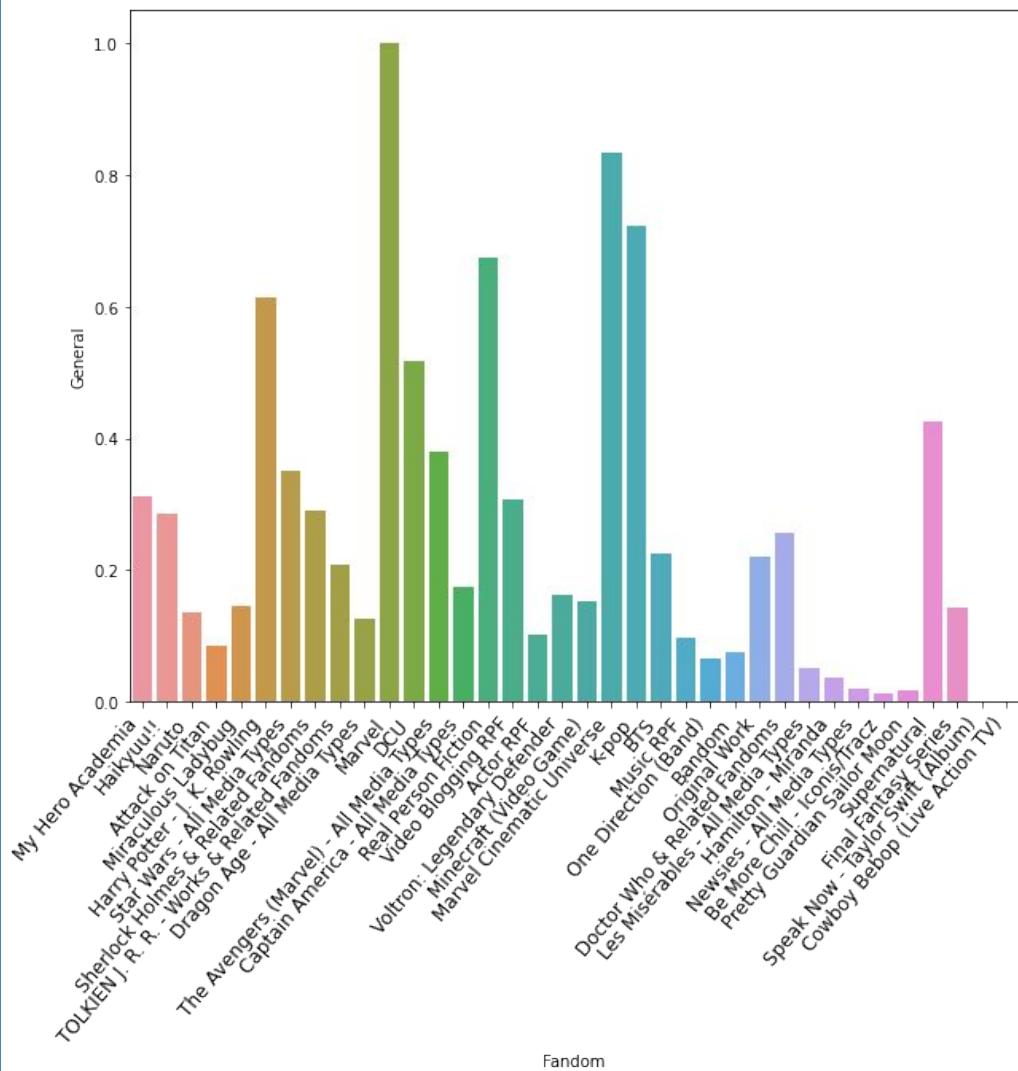
# Teen Ratings by Fandom

\*the diagram is normalized using min-max normalization



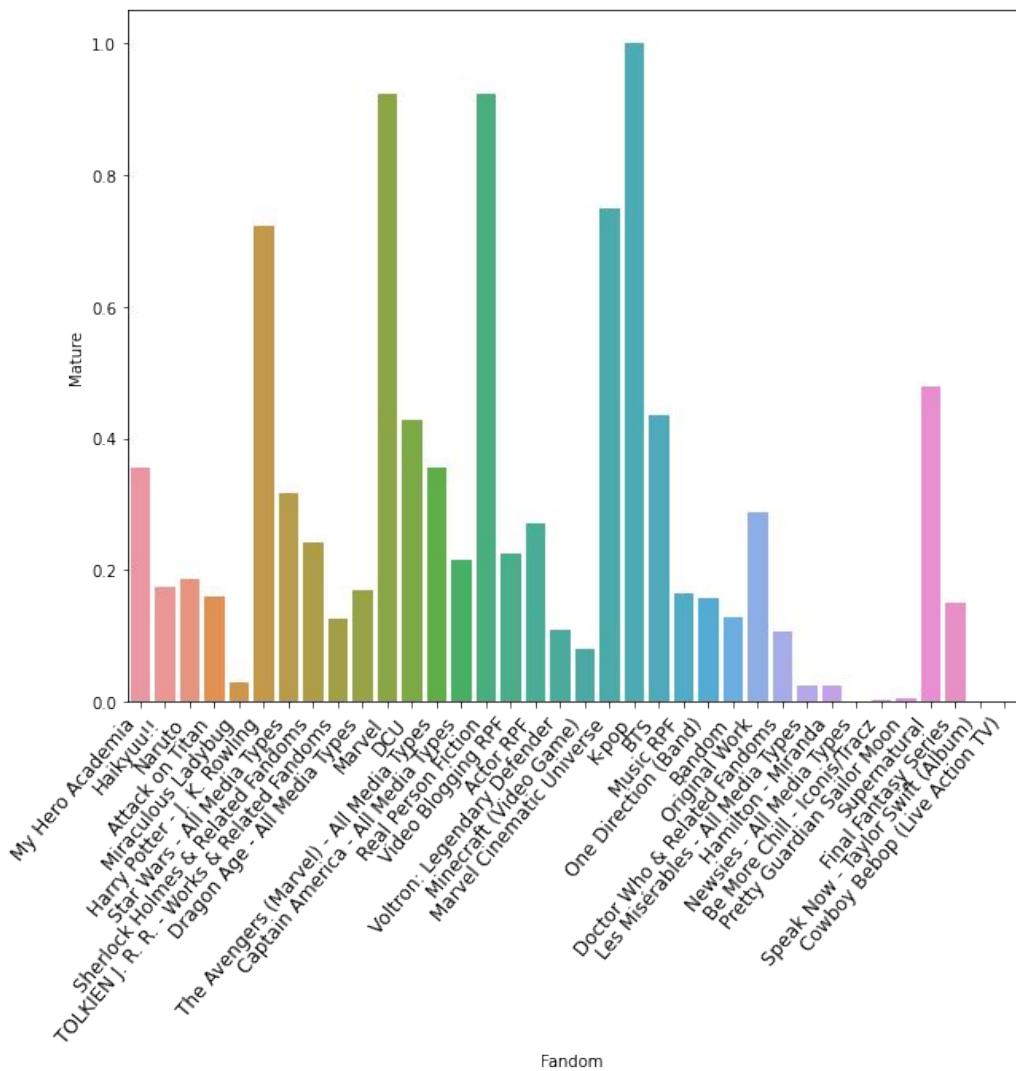
## General Ratings by Fandom

\*the diagram is normalized using min-max normalization



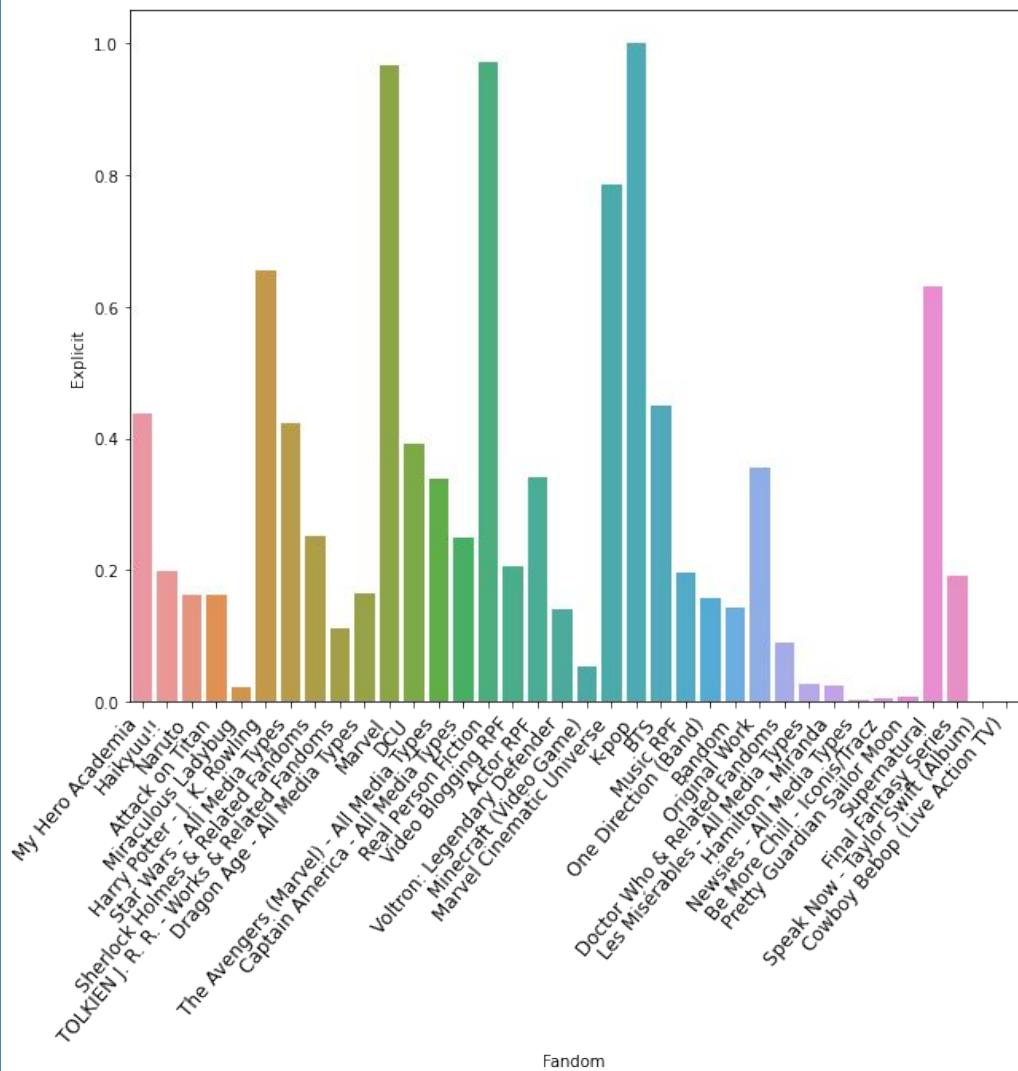
## Mature Ratings by Fandom

\*the diagram is normalized using min-max normalization



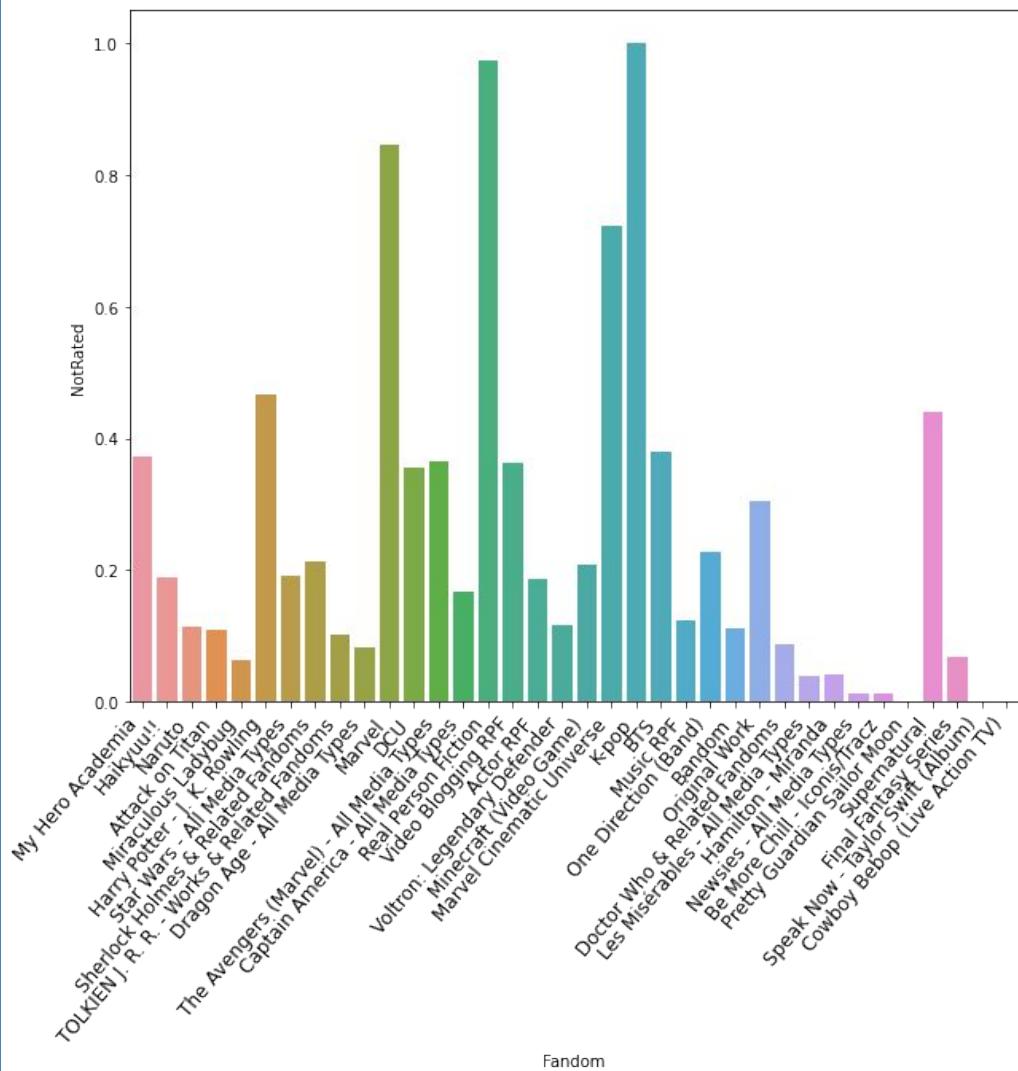
## Explicit Ratings by Fandom

\*the diagram is normalized using min-max normalization

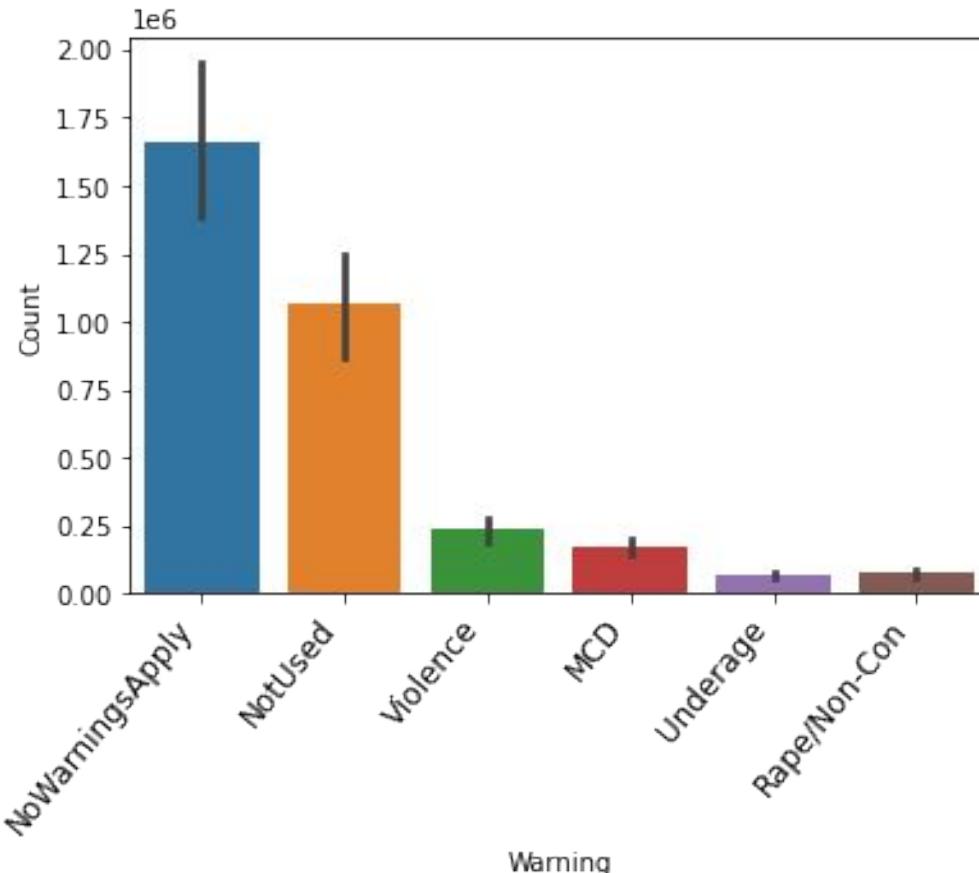


## Non-rated Ratings by Fandom

\*the diagram is normalized using min-max normalization

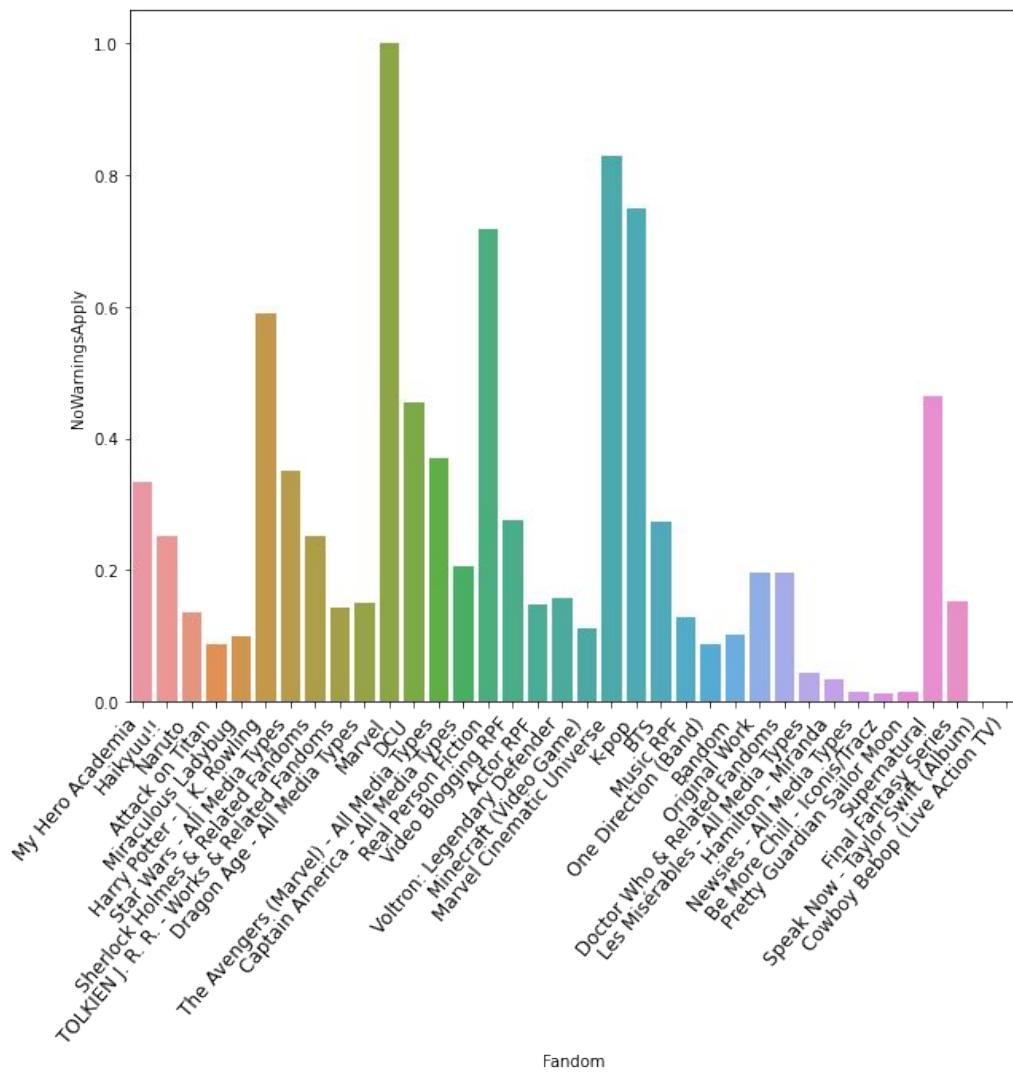


# Distribution of Warnings



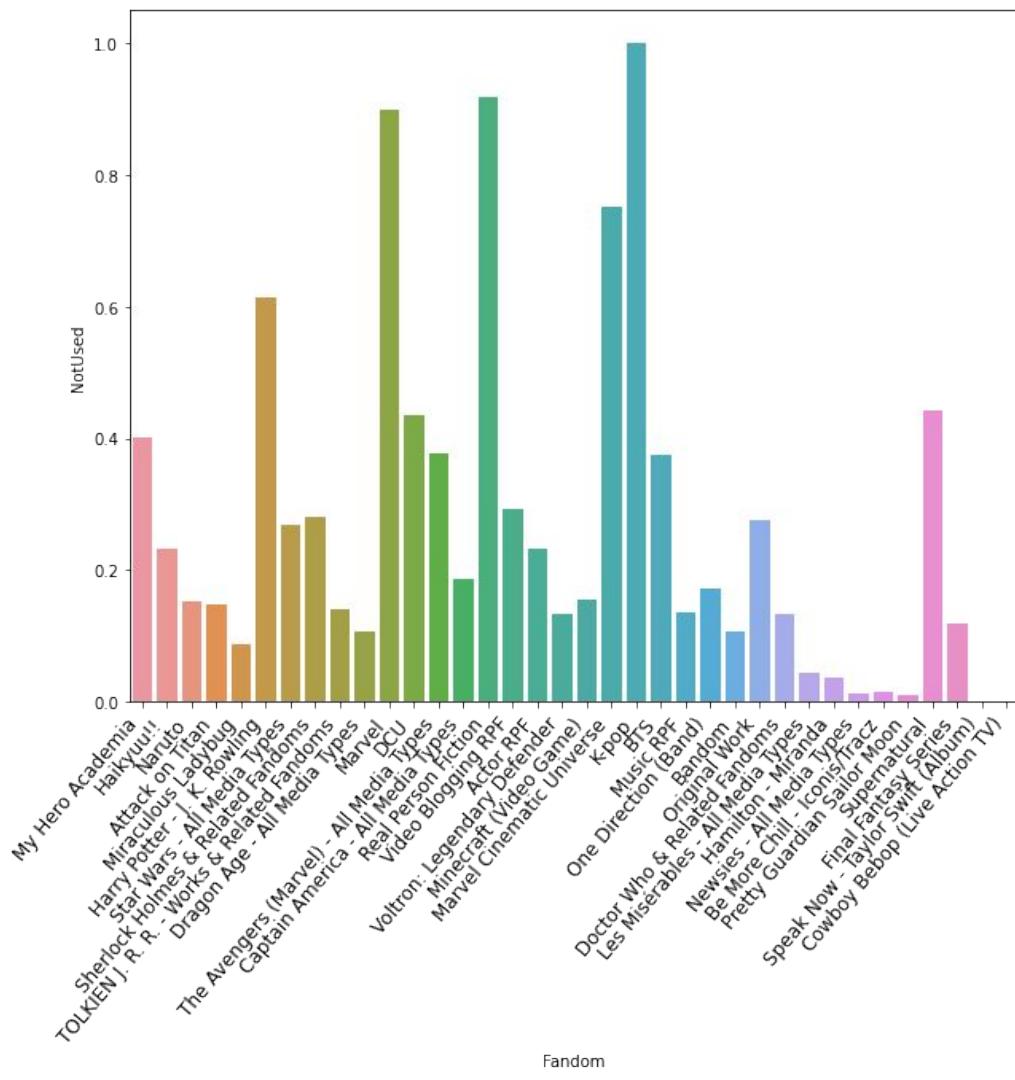
Fanworks may deal with controversial and painful issues; AO3 encourages creators to choose warnings that help users make decisions about the works they access.

**AO3 requires** that creators either warn for—or explicitly choose not to warn for:  
**Major Character Death, Underage, Rape/Non-Con, and Graphic Depictions of Violence**



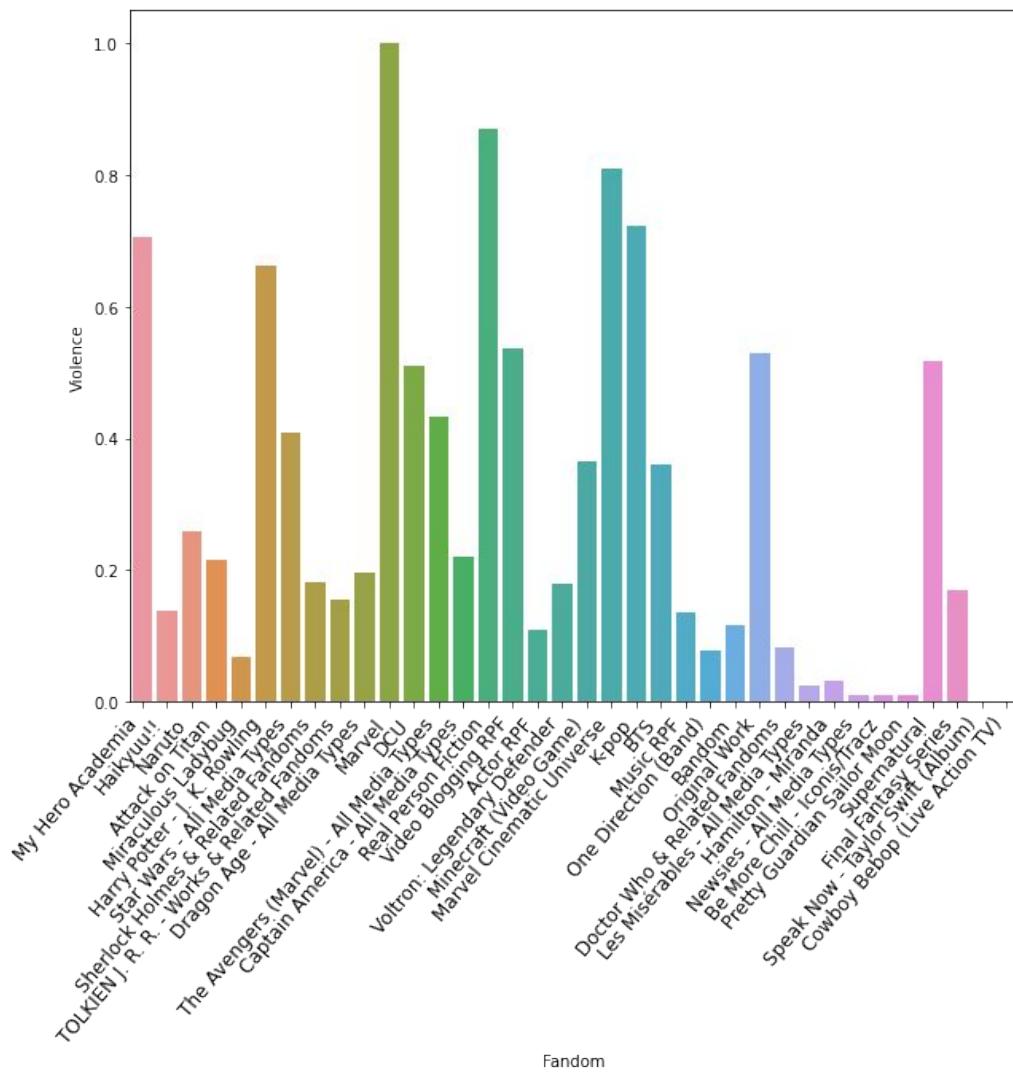
## No Warnings Apply by Fandom

\*the diagram is normalized using min-max normalization



## Warnings Not Used by Fandom

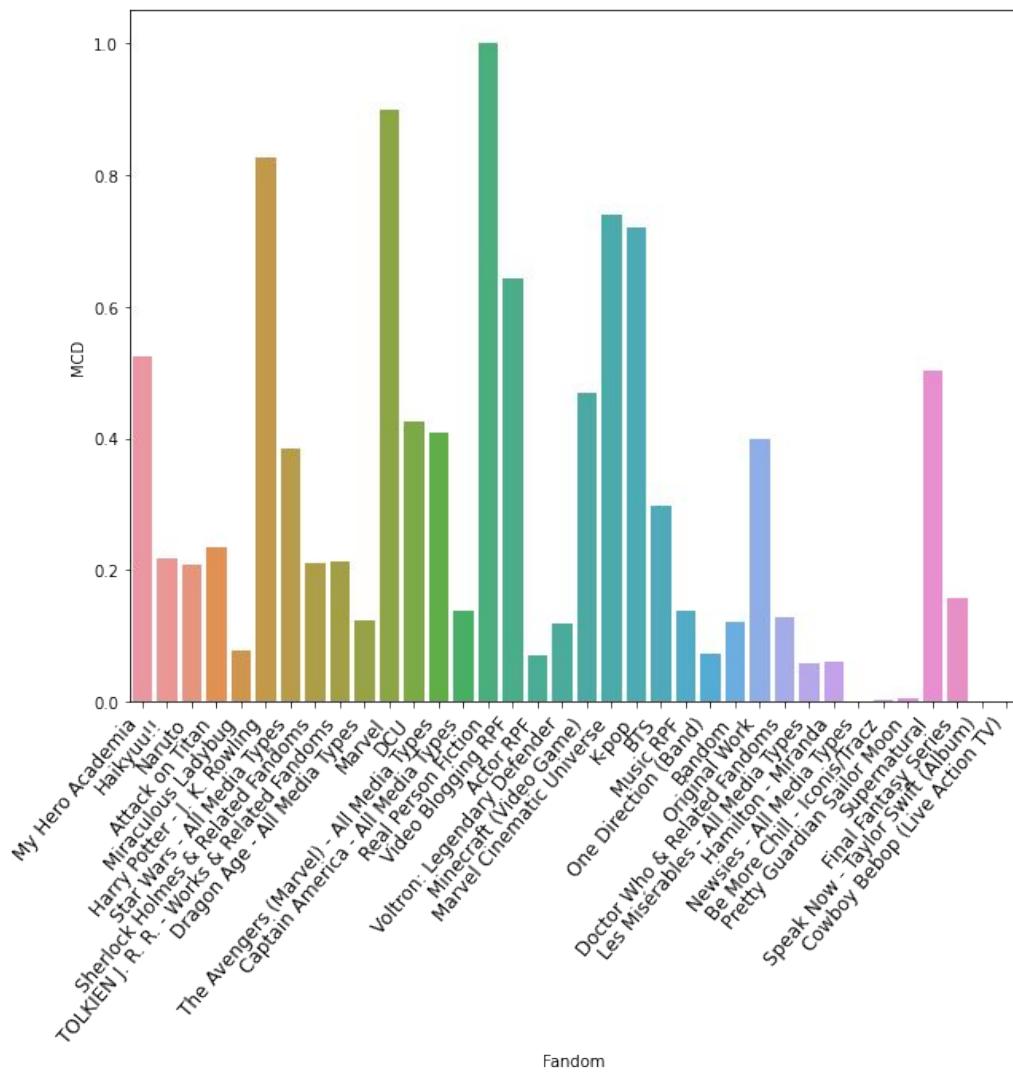
\*the diagram is normalized using min-max normalization



## Violence warning by Fandom

- Violence in source material **VS** violence warning high due to high number of fics in fandom

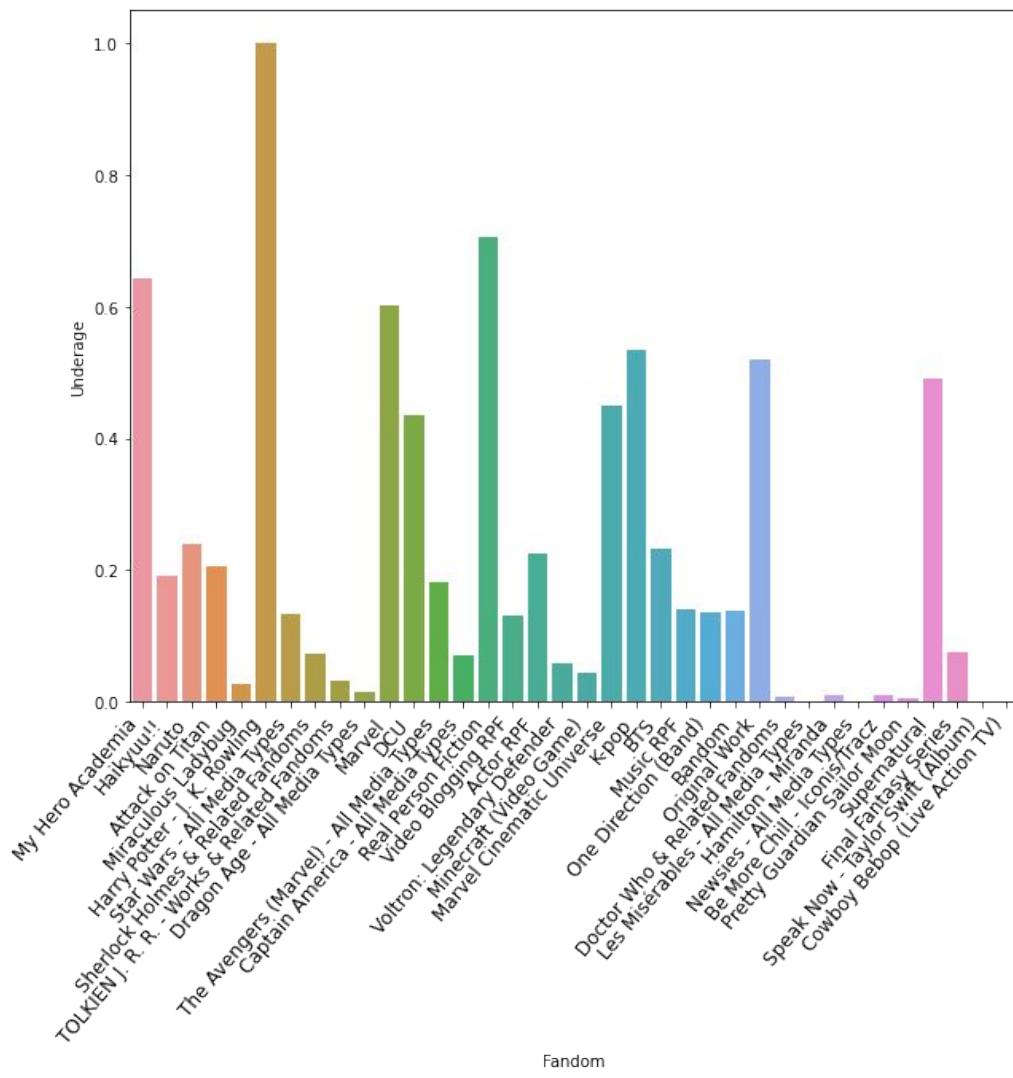
\*the diagram is normalized using min-max normalization



## Major Character Death by Fandom

- Influence of source material (Marvel and Harry Potter fandoms) **VS** size of fandom

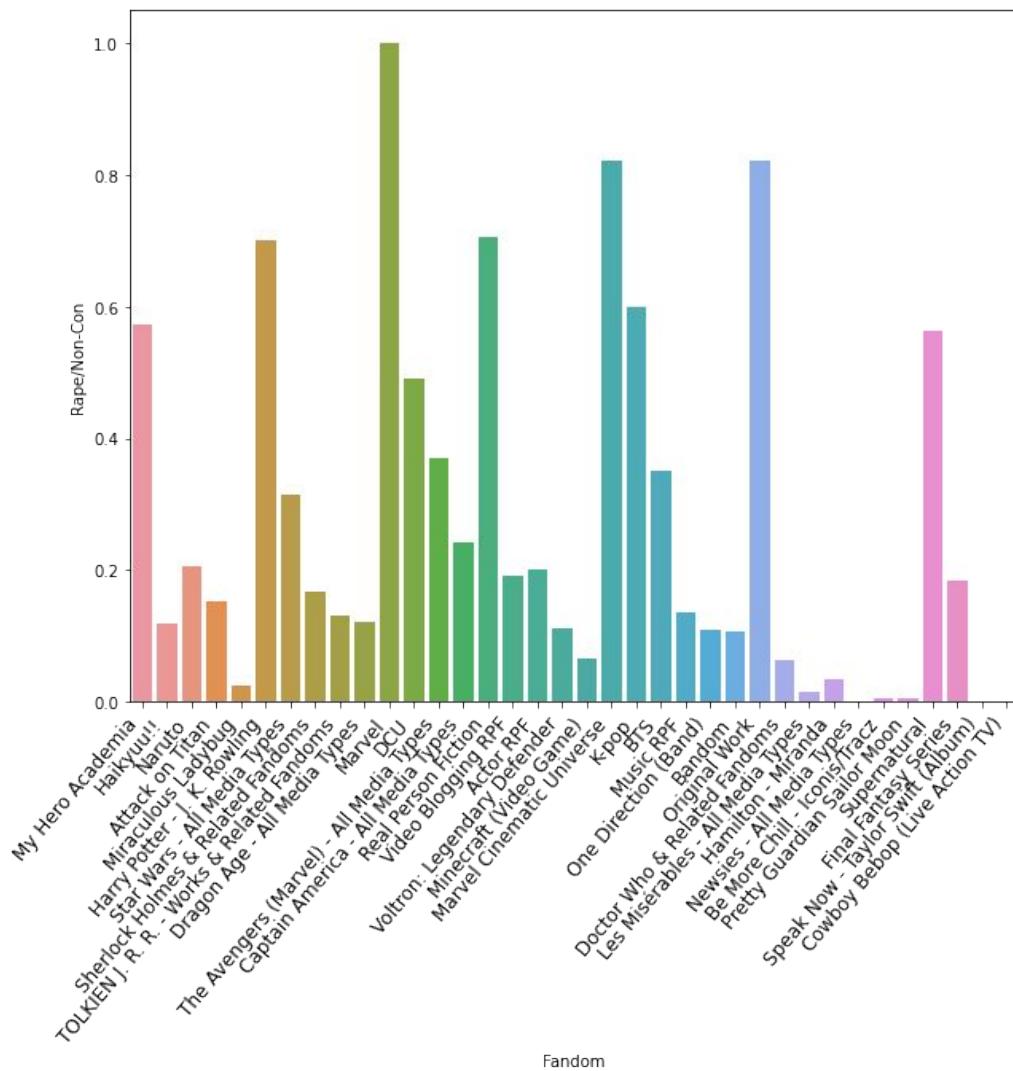
\*the diagram is normalized using min-max normalization



## Underage warning by Fandom

- Underage characters in source material

\*the diagram is normalized using min-max normalization

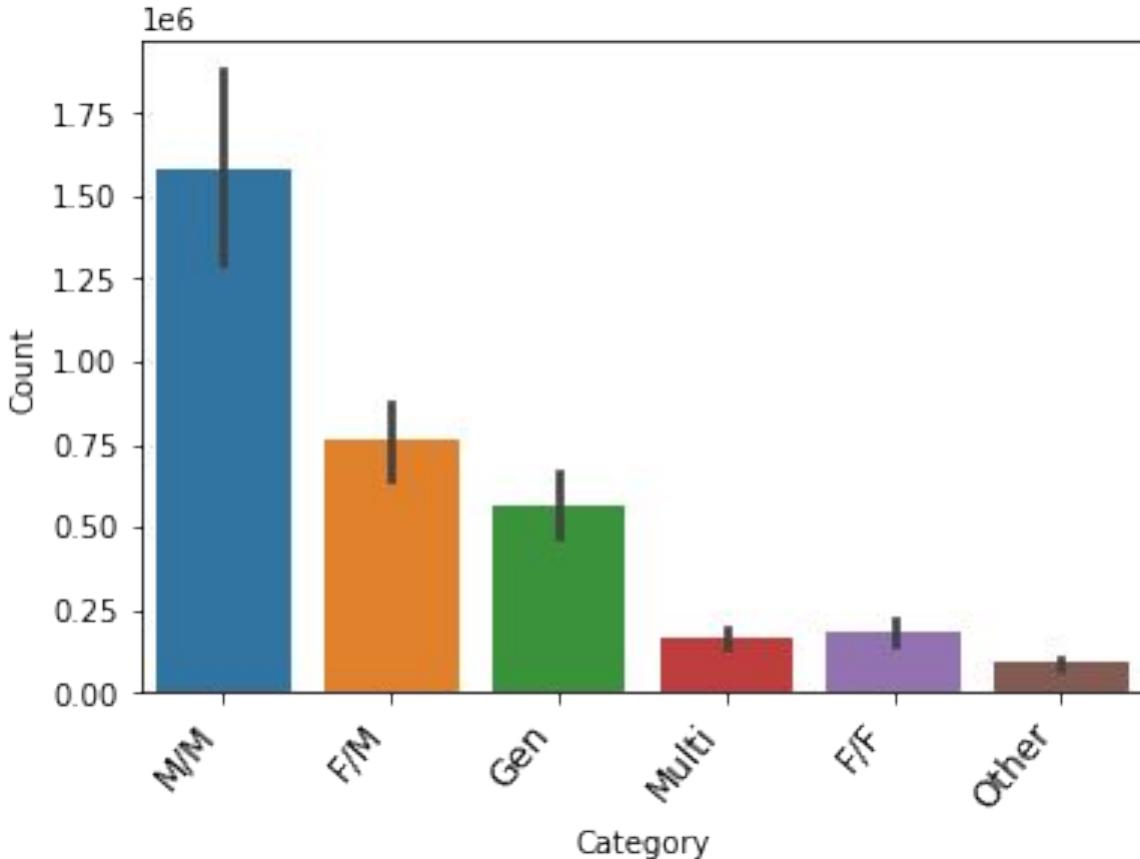


## Rape/Non-Con by Fandom

- Fandom can be a space where authors write to work through personal trauma

\*the diagram is normalized using min-max normalization

# Distribution of Ship Categories

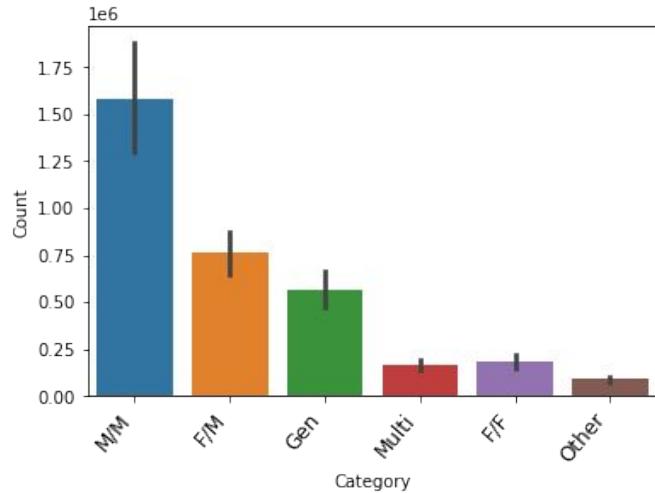


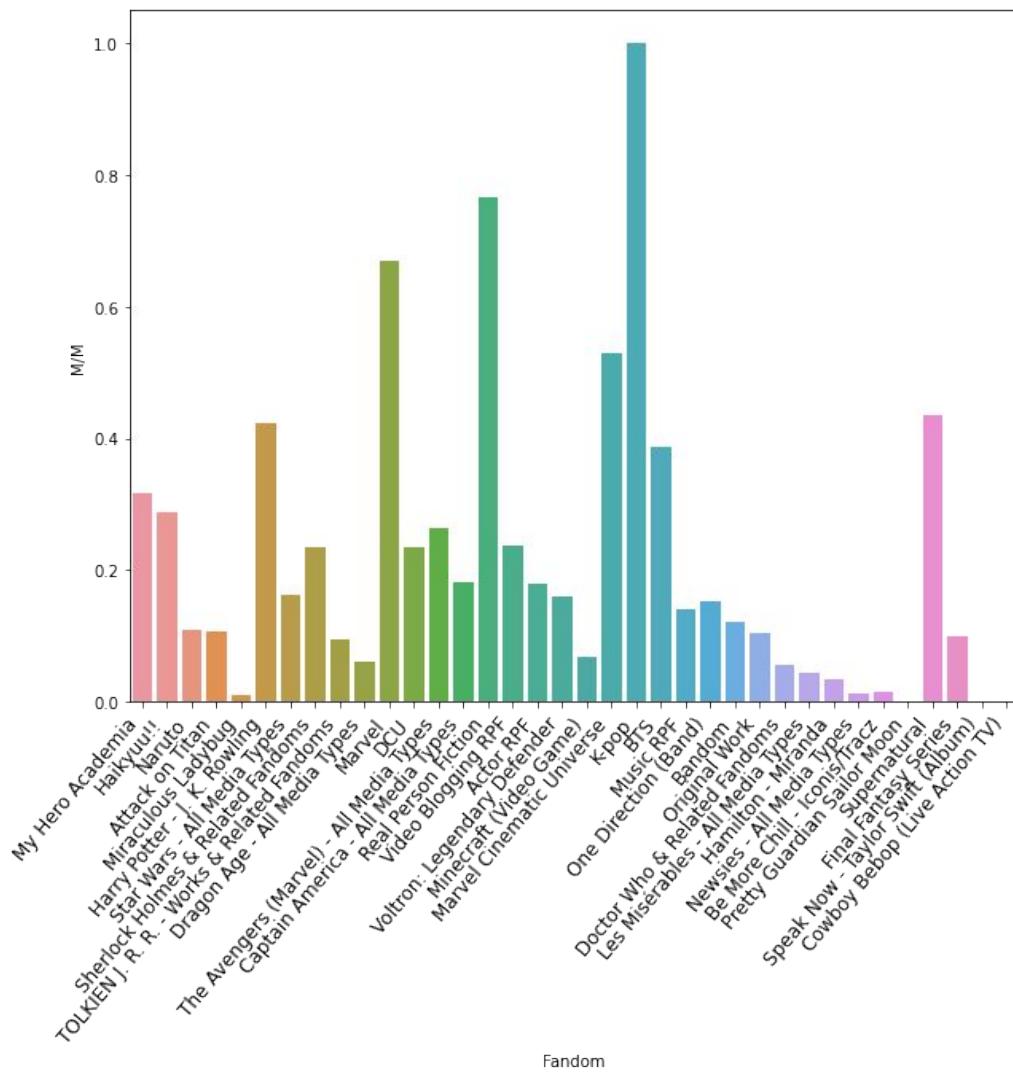
**Ship Category** - the romantic and/or sexual relationship(s) the work includes (if any).

# Distribution of Ship Categories

M/M relationships are the most popular:

- *lack of developed female characters* => the relationships between men in shows were some of the most interesting character dynamics and interactions.
- most *developed relationships* they are the easiest to build upon
- Fandom is a place to have *representation* queer people do not see in media

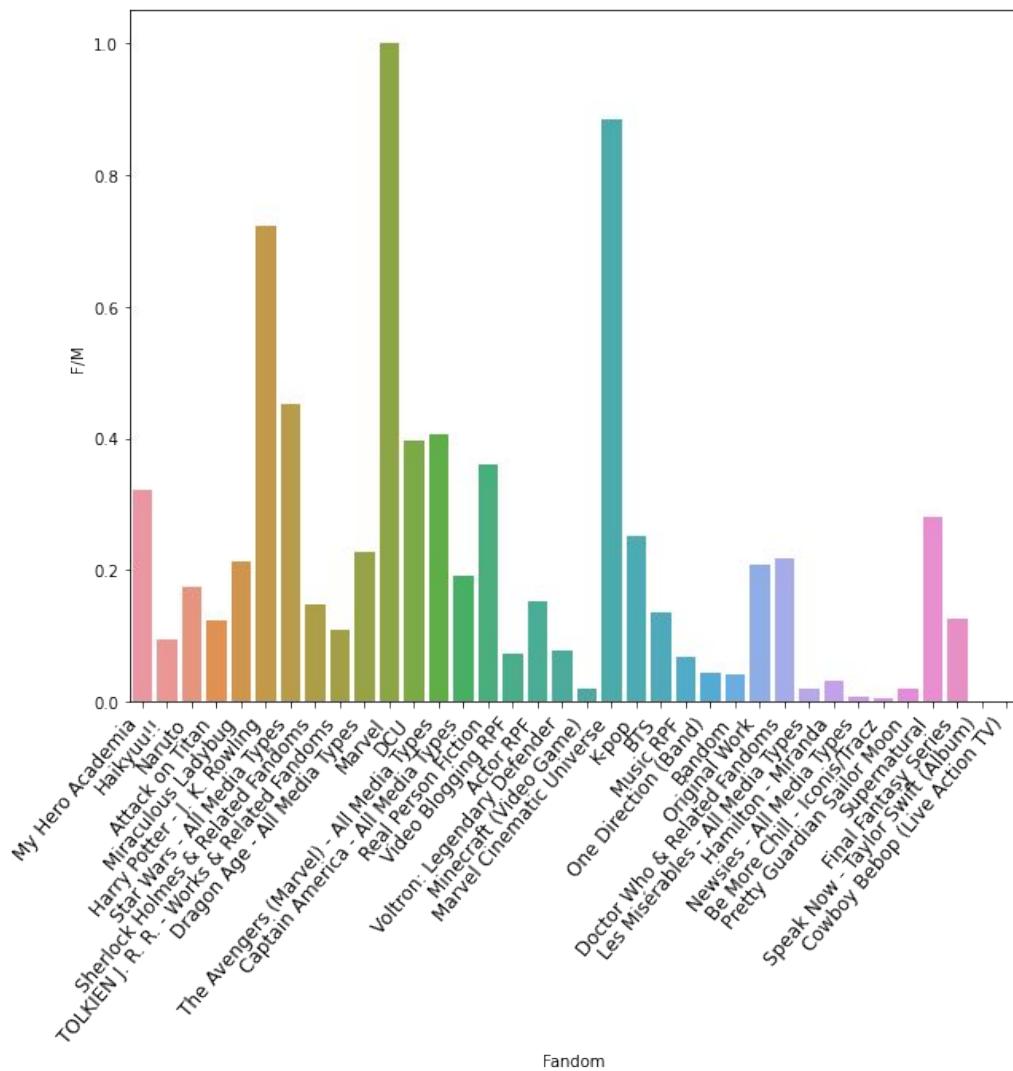




## M/M by Fandom

- Fandoms with primarily male characters

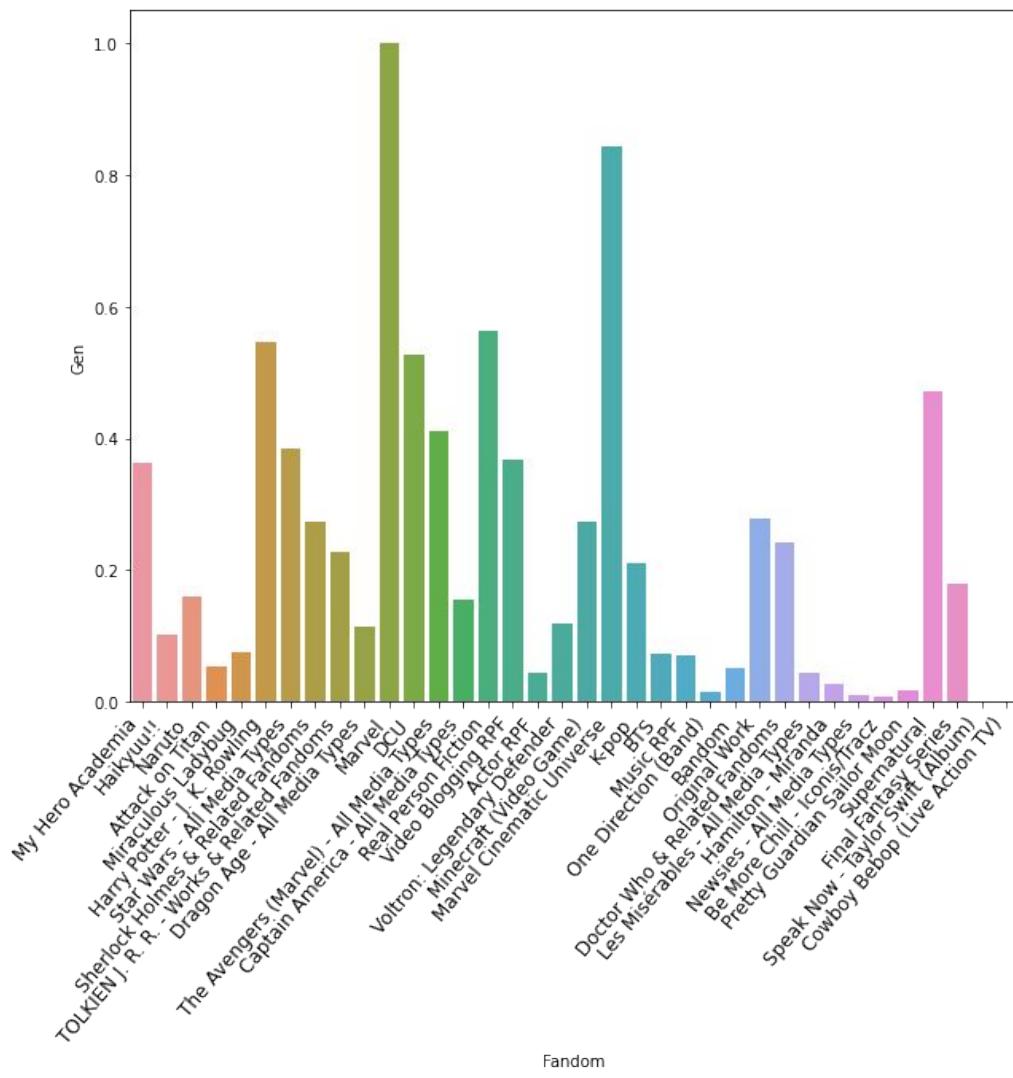
\*the diagram is normalized using min-max normalization



## F/M by Fandom

- This is usually popular fandoms that have large support for canon F/M relationships .

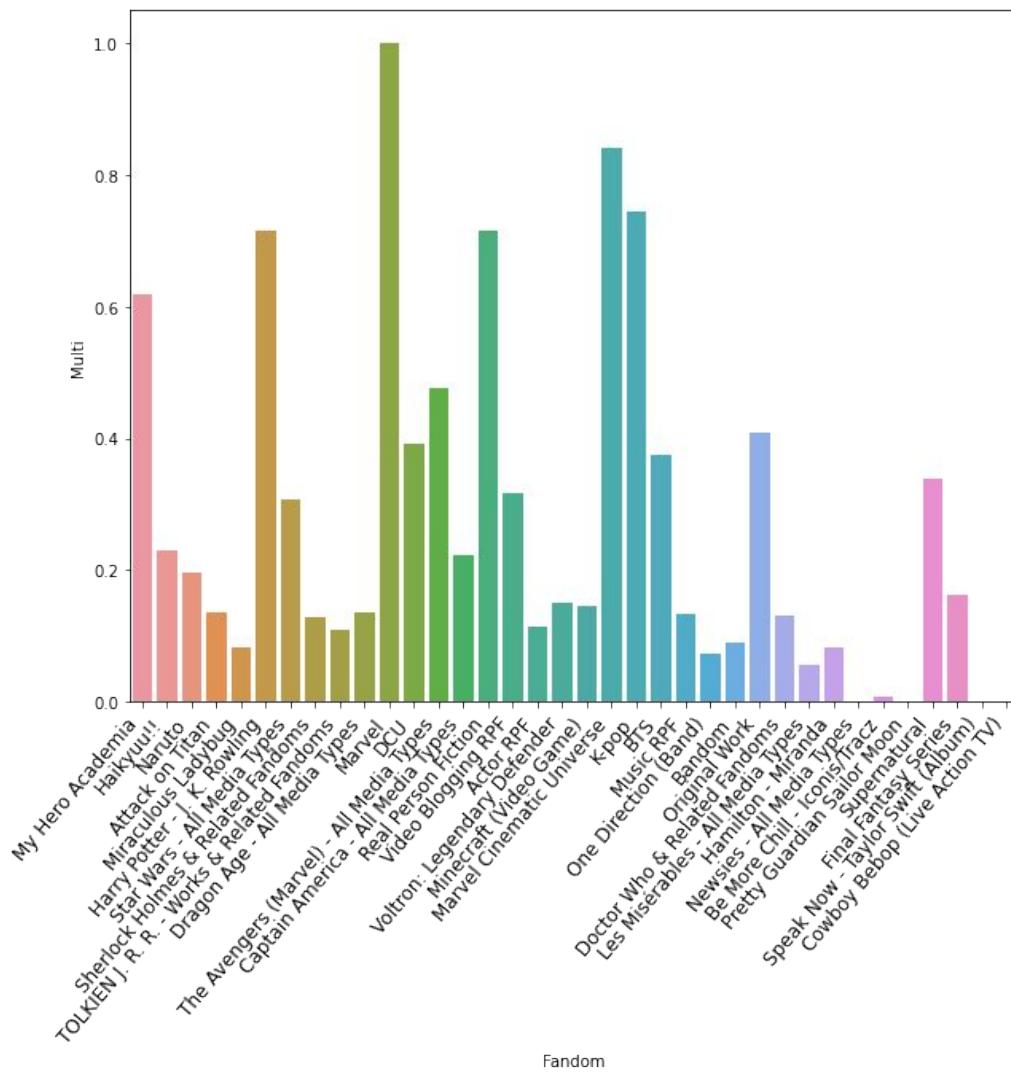
\*the diagram is normalized using min-max normalization



## Gen by Fandom

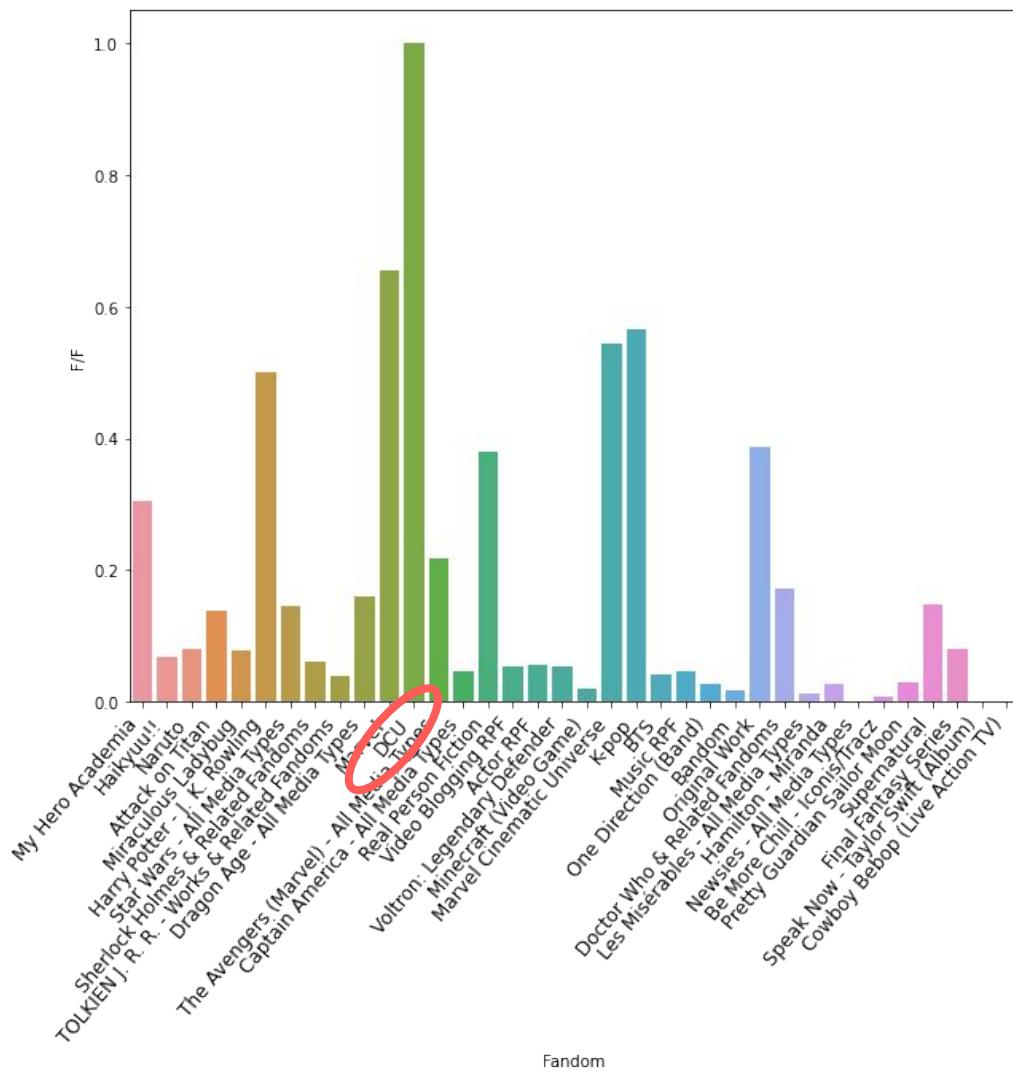
- Fandoms popular with the Found Family trope or has strong canon friendships.

\*the diagram is normalized using min-max normalization



## Multi by Fandom

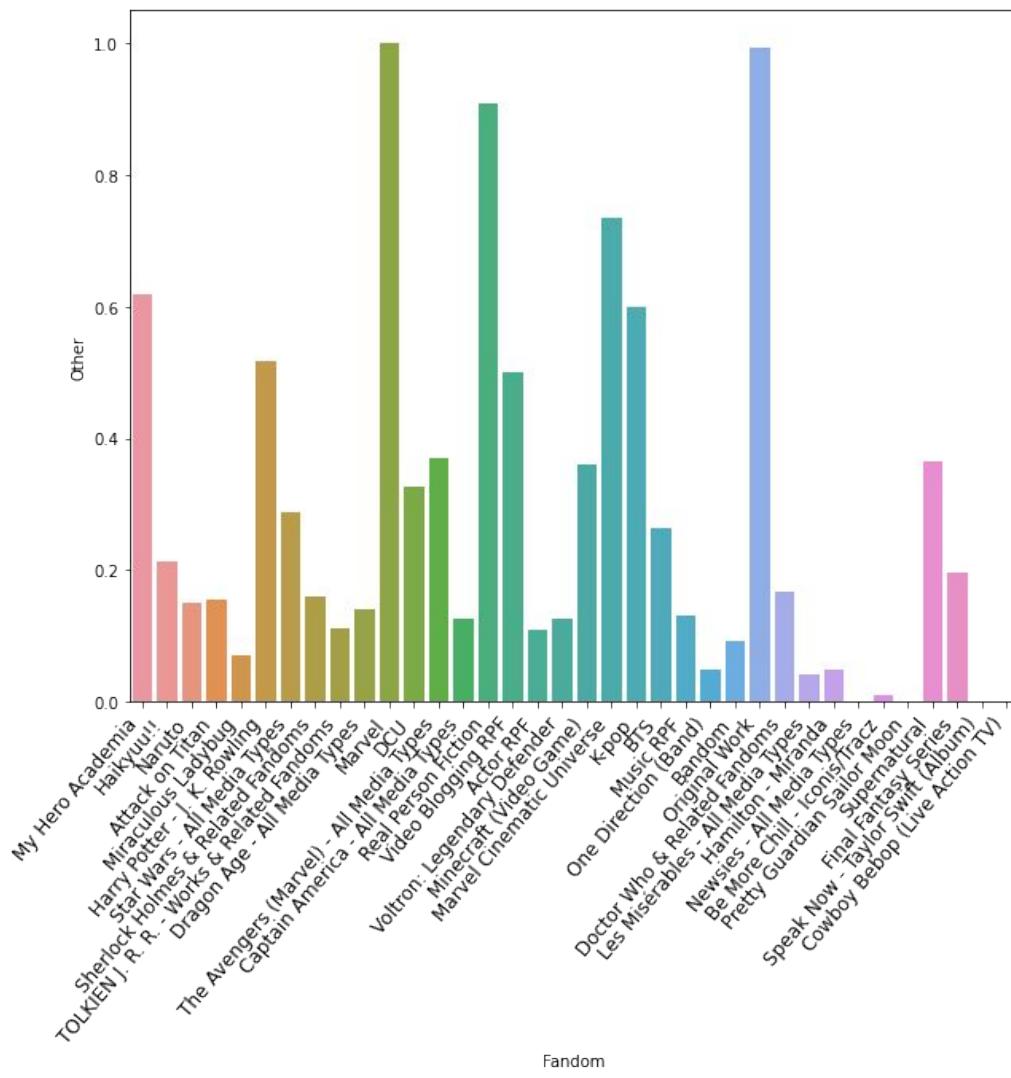
\*the diagram is normalized using min-max normalization



## F/F by Fandom

- DC Comics (the source of the DC Cinematic Universe ie. DCU) has several popular queer women within the comics (Wonder Woman, Poison Ivy, Harley Quinn)

\*the diagram is normalized using min-max normalization



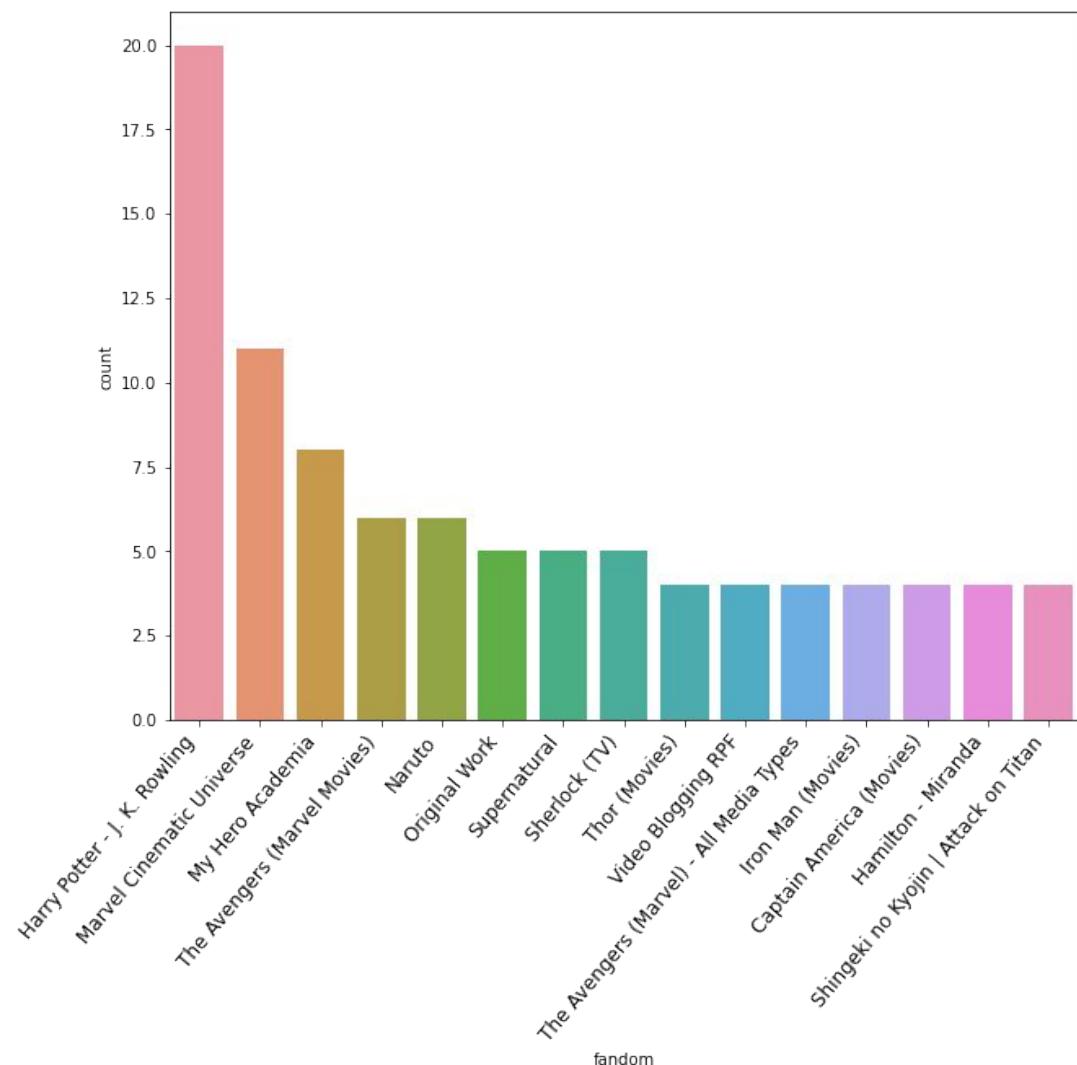
## Other by Fandom

\*the diagram is normalized using min-max normalization

## Fandoms in Crossover Fics

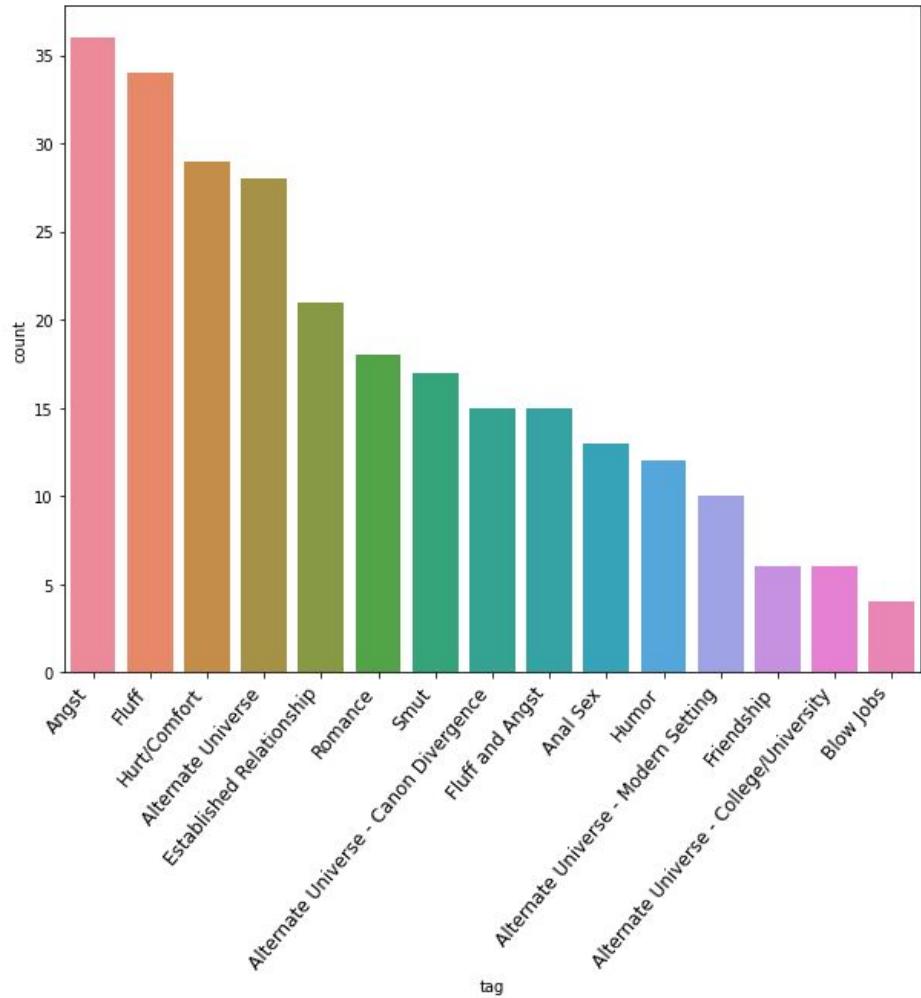
A **crossover** is when the fanfiction takes place using the settings or characters of more than one fandom.

E.g. Harry Potter or Hogwarts AU where the characters from another fandom attend Hogwarts.

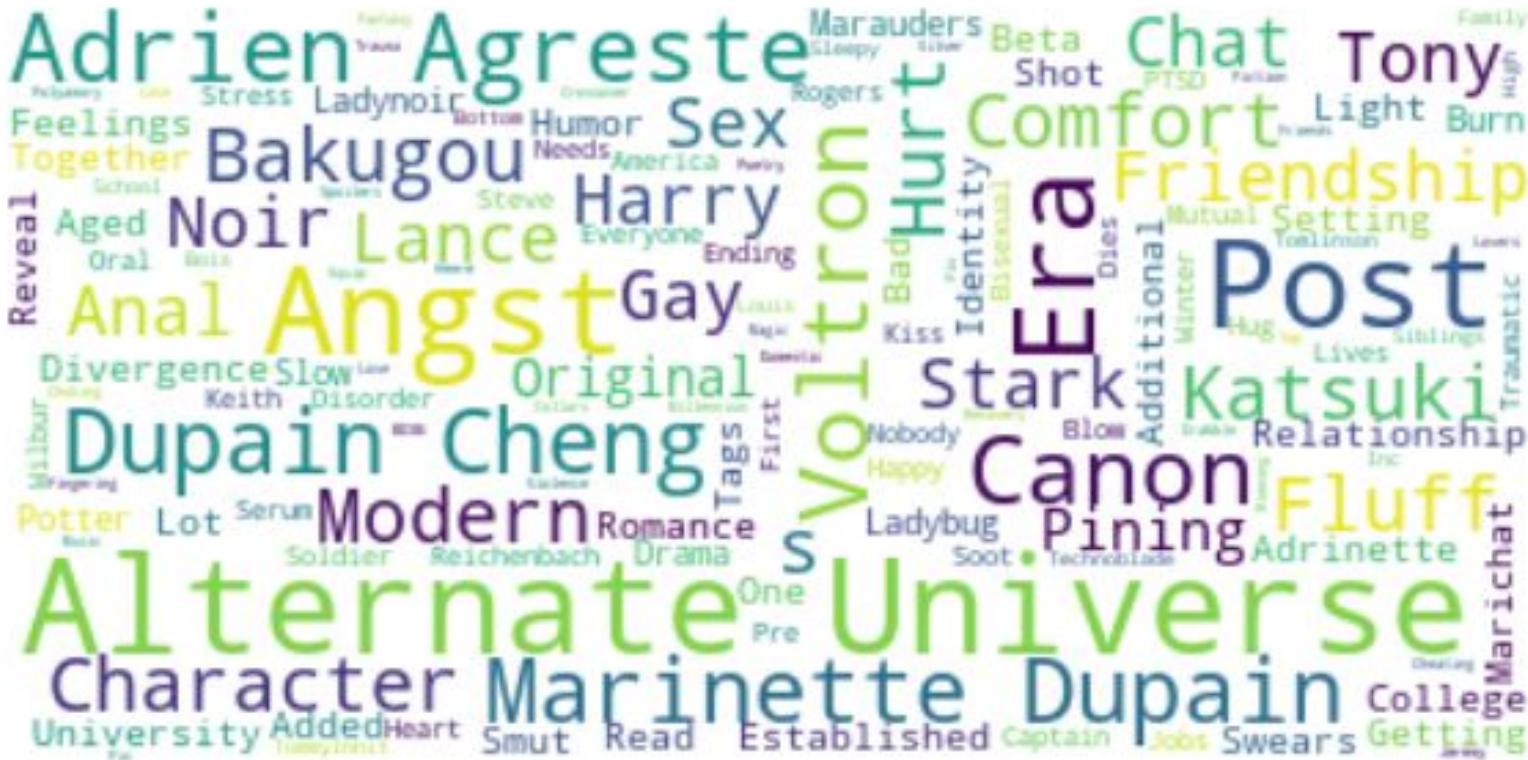


## Freeform Tags

- Tags that are written and added to the story by the author. There can be as many or as little as they like.



# Wordcloud run on Freedom Tags





# Social Network Analysis (SNA)

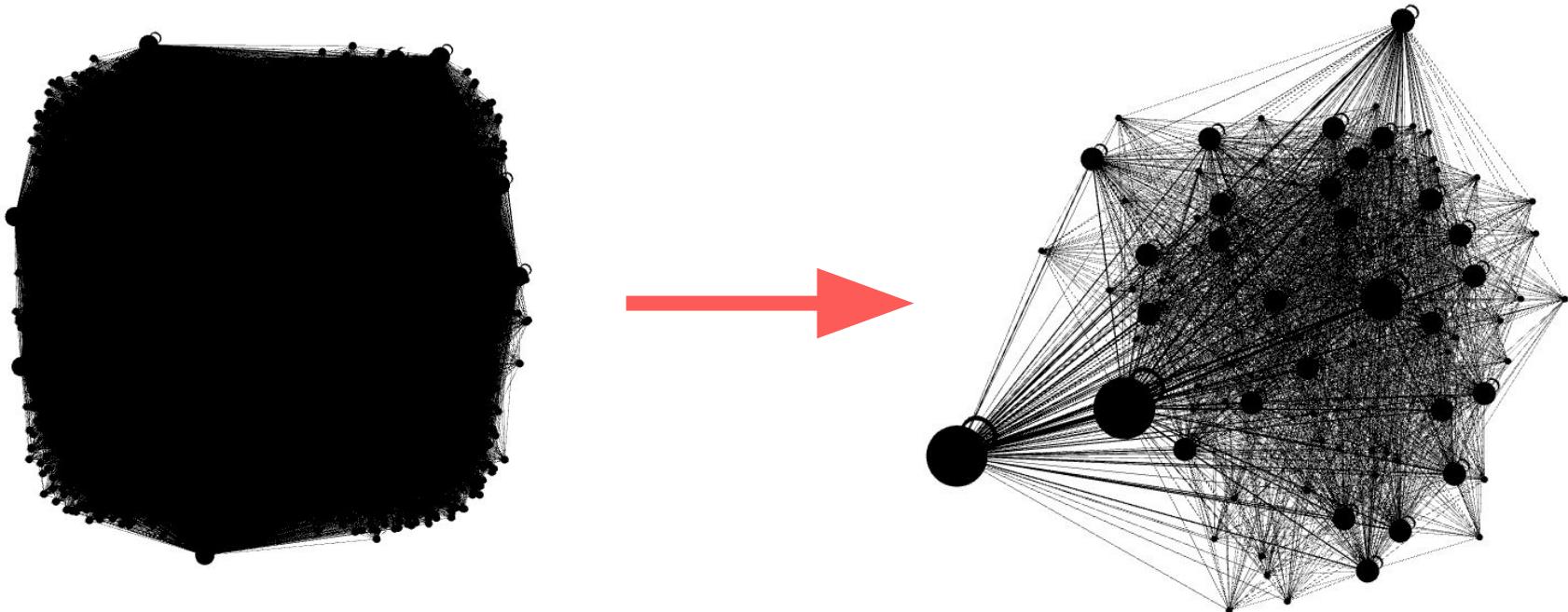
We are looking at the **Networks created by Bookmarks, Characters, Tags, and Relationships** (Ships) on AO3.

Fanfictions (fics) can be sorted by Bookmarks and are shown on user profiles.

1. Do people read within the same genre/fandom?
2. Are we able to predict if someone will like a fic based on their bookmarks/fandoms they read?
3. Which characters are most likely to appear in the same story with or even who they are most likely to be shipped with?
4. Are there any connections between tags on AO3?

# Common Fic - SNA

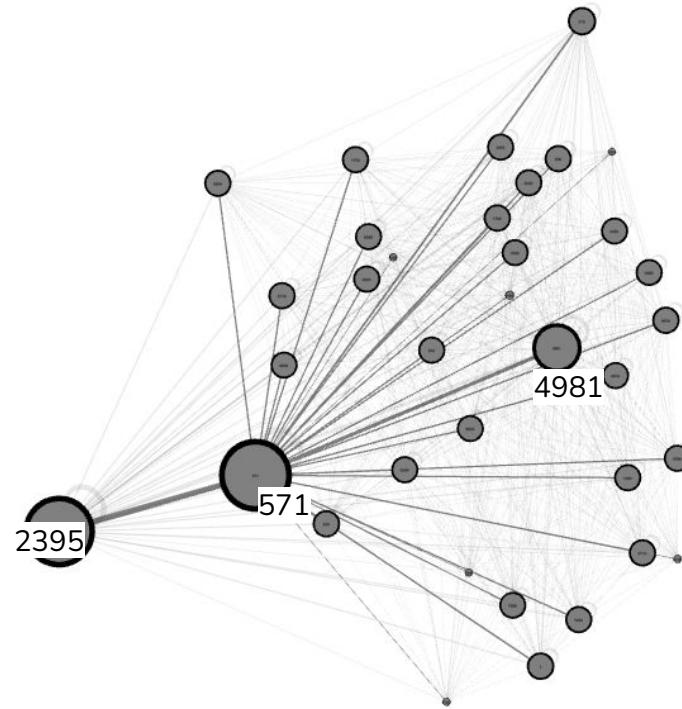
Weighted Degree filtered to 360.394 - 54433.0





# Common Fic - SNA

Weighted Degree filtered to 360.394 - 54433.0





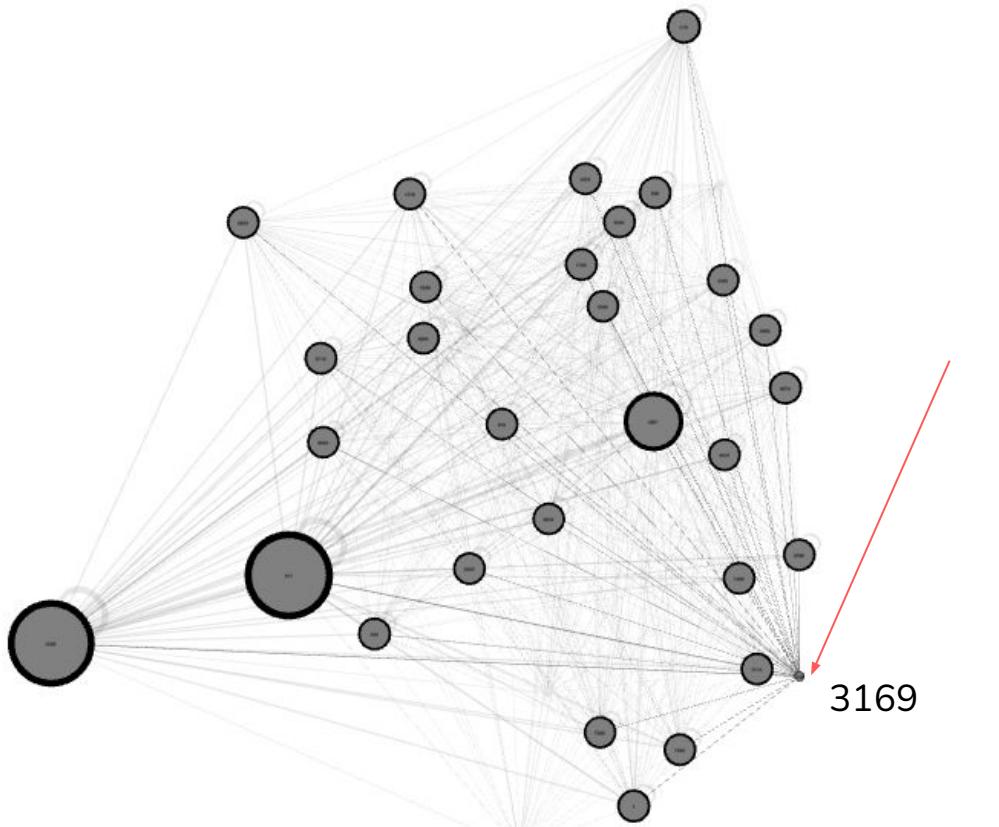
## Important Nodes - Information

Node	Link
4981	/works/10795731
571	/works/28755084
2395	/works/2304905
3476	/works/6447187
318	/works/5096105
7365	/works/6521773
2385	/works/403644



# Important Nodes - Information

Node	Fandom Info
4981	BTS
571	Video Blogging RPF/Minecraft
2395	Captain America (Movies)
3476	Superman - All Media Types/DCU
318	Haikyuu!!
7365	Newsies - All Media Types (AMT) and More
2385	Actor RPF and More



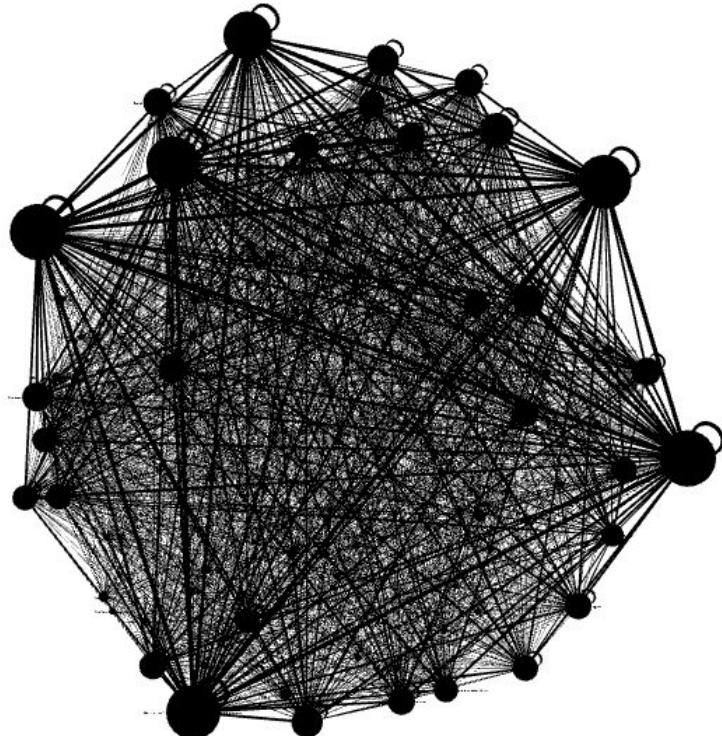
When a user bookmarks the top-fic in Captain America (Movies), BTS, or Video Blogging RPF it is likely that they would bookmark a fic in another of the listed fandoms

Node 3169 (Hannibal Hannigram fic - The Most Dangerous Game - Victorian Era AU) is not in fics or fandoms scraped:

- implies that those who have read the highest bookmarked fic in the fandoms highlighted, are more likely to read this fic than other fics.



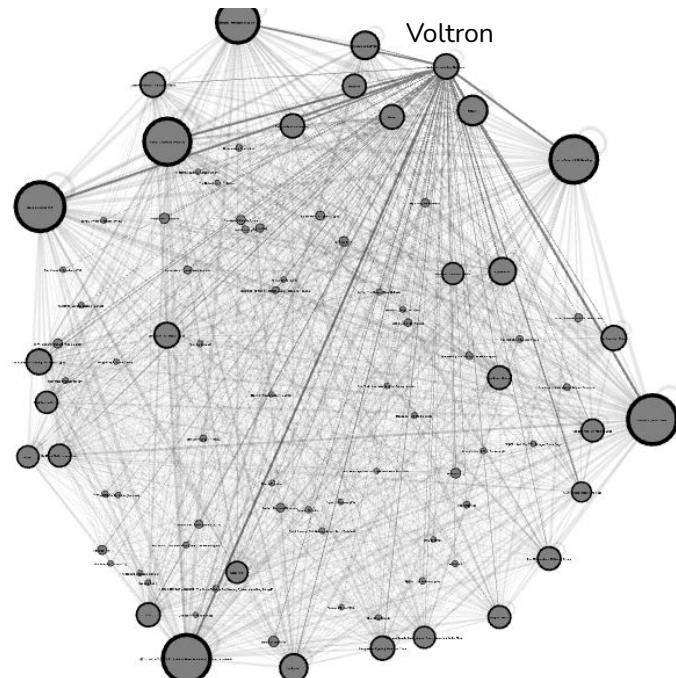
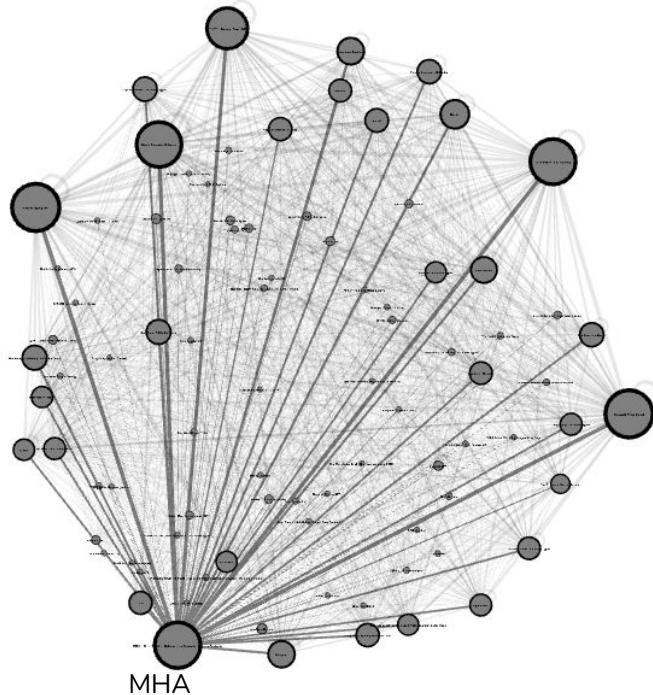
# Common Fandom - SNA



## Connections between fandoms:

Fandoms of bookmarked fics from users who bookmarked the “top bookmarked” fic in each of the fandoms we looked at.

# Common Fandom - SNA



# Important Nodes - Information

## Biggest Fandoms:

- *BTS, Video Blogging, MCU, Harry Potter, Minecraft, MHA*

## Second Biggest Fandoms:

- *Naruto, Miraculous Ladybug, Supernatural, Star Wars - AMT, The Avengers - AMT, Haikyuu*

## Third Biggest Fandoms:

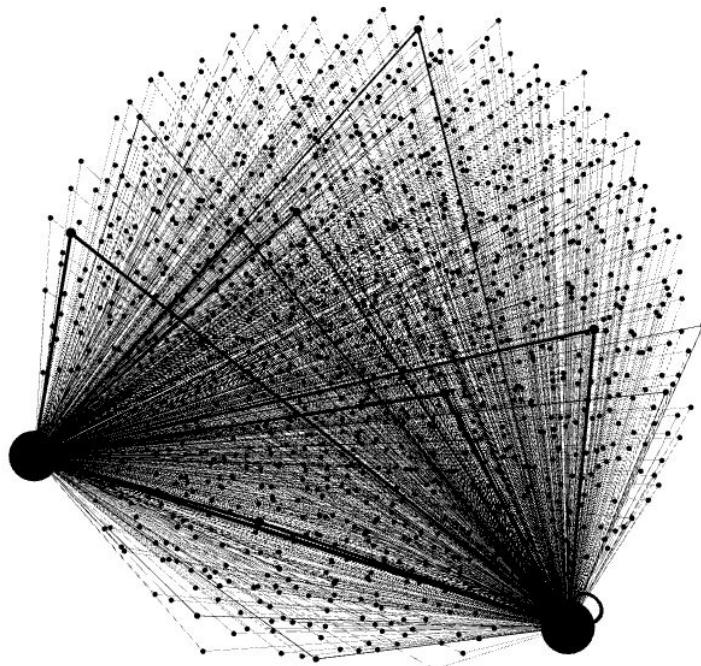
- *Bandom, Captain America AMT/Movies, Marvel, Newsies - AMT, Voltron, One Direction, Hamilton - Miranda, Dragon Age - AMT, Les Mis - AMT, Original Work, Pretty Guardian Sailor Moon, Attack on Titan, Actor RPF, DCU, RPF, Be More Chill, K-Pop, The Avengers (Marvel Movies)*

## Fourth Biggest Fandoms:

- *Hannibal (TV), Avatar the Last Airbender (ATLA), Iron Man (Movies), Sherlock (TV), Teen Wolf (TV), Spider-Man - AMT, Batman - AMT, Dream SMP - Fandom, Genshin Impact*



# My Hero Academia/Naruto Common Fandom Graph

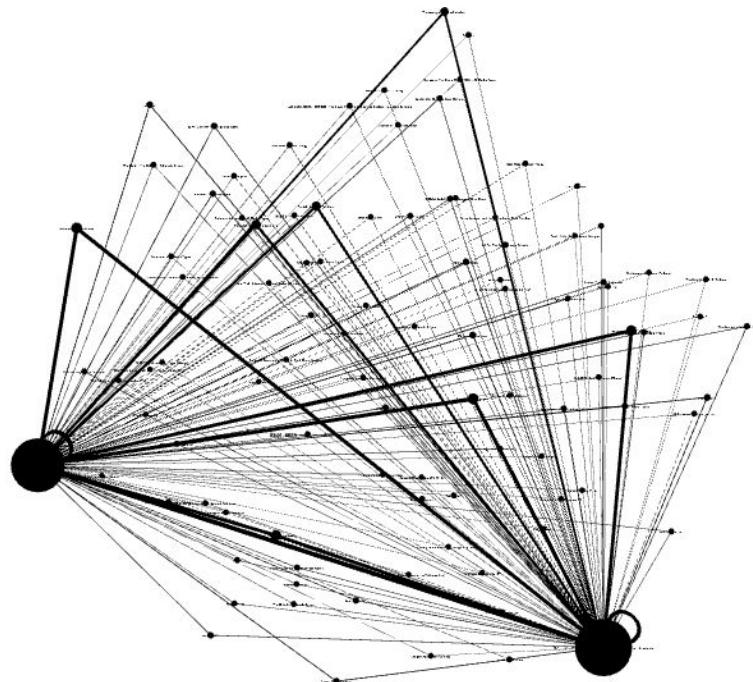


**Do the readers cross genre lines?**

Two large nodes: MHA and Naruto



# My Hero Academia/Naruto Common Fandom Graph



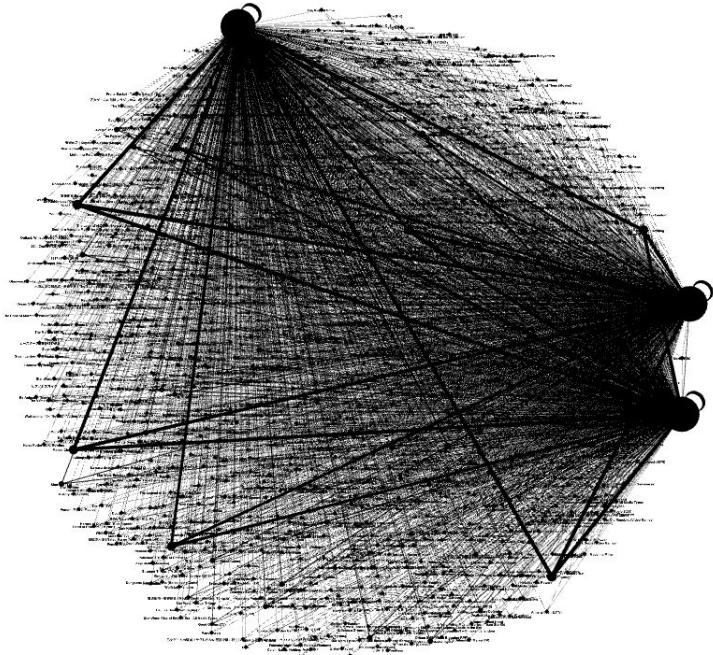
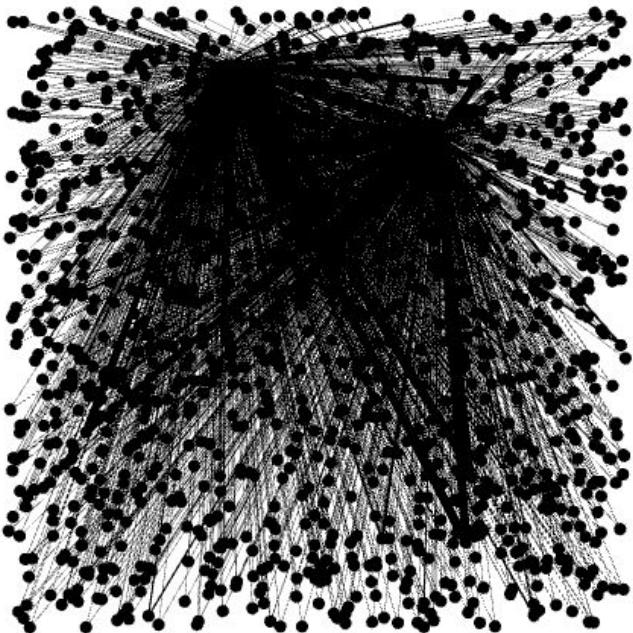


# Important Nodes - Information

Node	Fandom
15	Marvel Cinematic Universe
41	Video Blogging RPF
50	Minecraft (Video Game)
63	Captain America (Movies)
29	Harry Potter - J. K. Rowling
43	방탄소년단   Bangtan Boys   BTS
60	The Avengers (Marvel Movies)

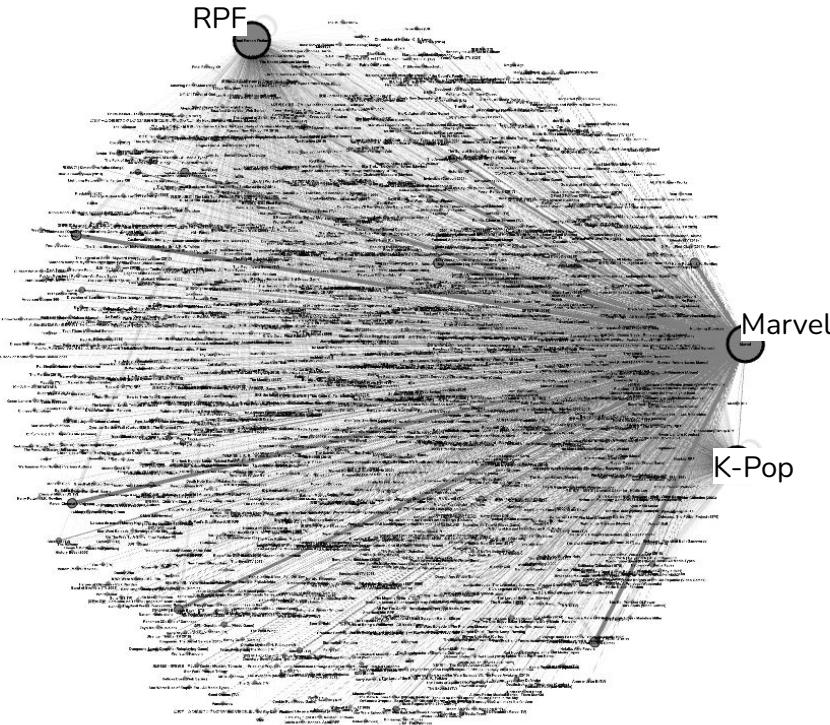


## Top 3 Fandoms - SNA



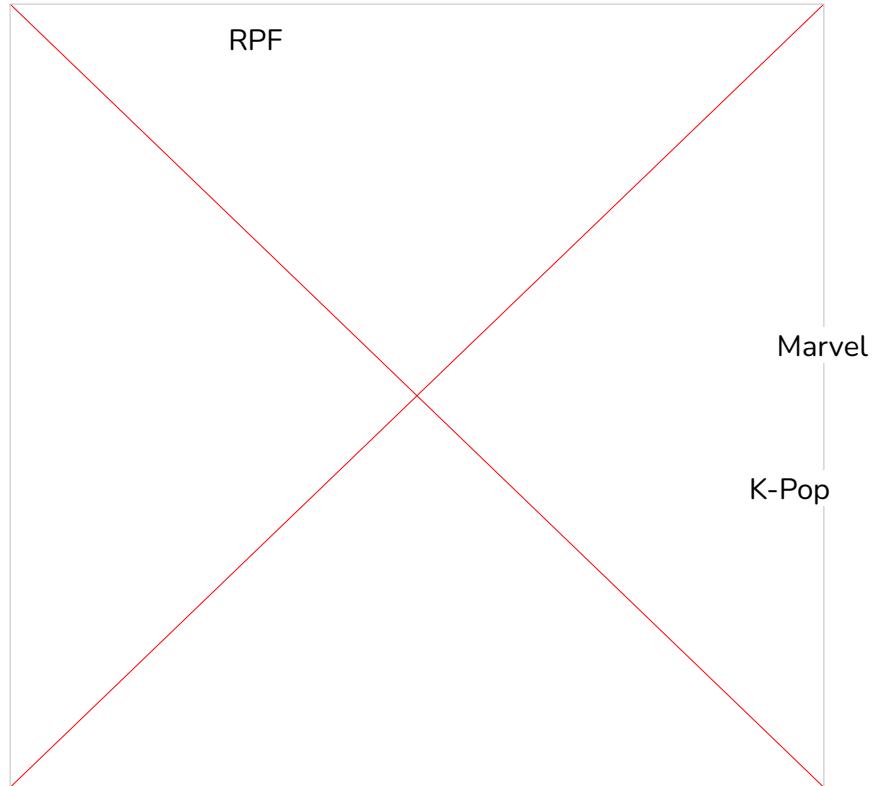


## Top 3 Fandoms - SNA





## Top 3 Fandoms - SNA



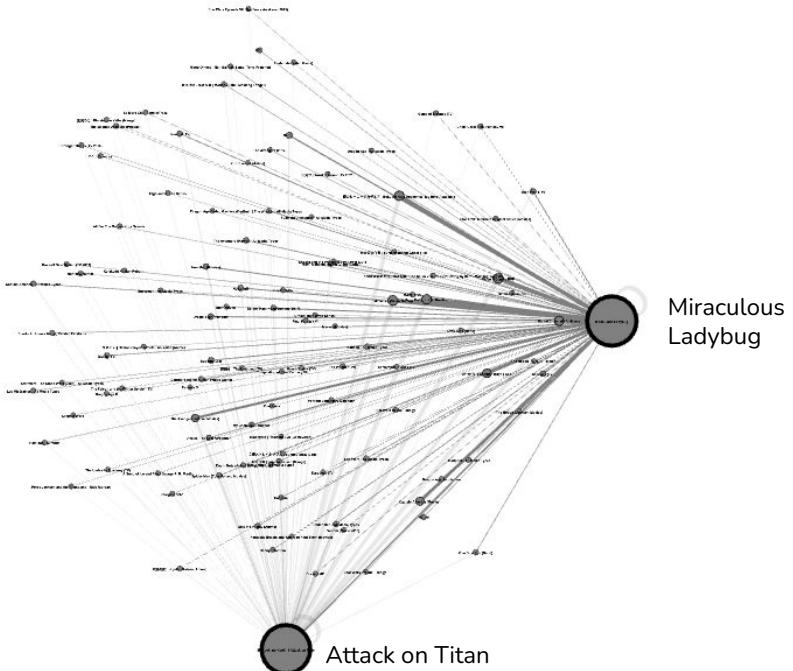
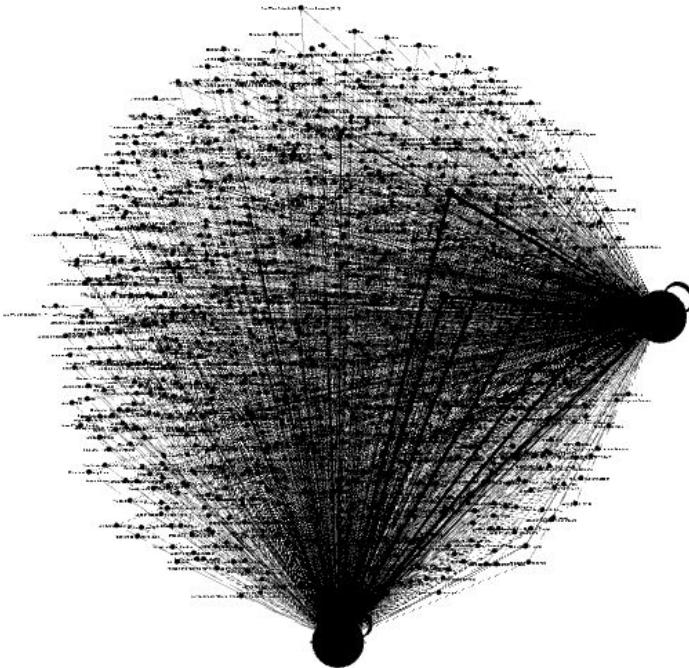


## Top 3 - Important Nodes - Information

Node Groups	Fandom(s)
<b>Biggest</b>	RPF, Marvel, K-Pop
<b>Second Biggest</b>	Harry Potter, Captain America (Movies), BTS, MHA, Minecraft, MCU, Video Blogging RPF
<b>Third Biggest</b>	Naruto, Avengers, Miraculous Ladybug, Haikyuu!!, <i>Iron Man (Movies)</i> , <i>Batman - AMT</i> , <i>Hannibal</i> , <i>Voltron</i> , <i>Teen Wolf</i> , <i>Sherlock (TV)</i> , <i>Genshin Impact</i> , <i>ATLA</i> , <i>Dream SMP</i>



# Lesser Known Anime





# Lesser Known Anime - Important Nodes

Node	Fandom
63	Captain America (Movies)
15	Marvel Cinematic Universe
50	Minecraft (Video Game)
29	Harry Potter - J. K. Rowling
41	Video Blogging RPF
1	僕のヒーローアカデミア   Boku no Hero Academia   My Hero Academia
60	The Avengers (Marvel Movies)
43	방탄소년단   Bangtan Boys   BTS

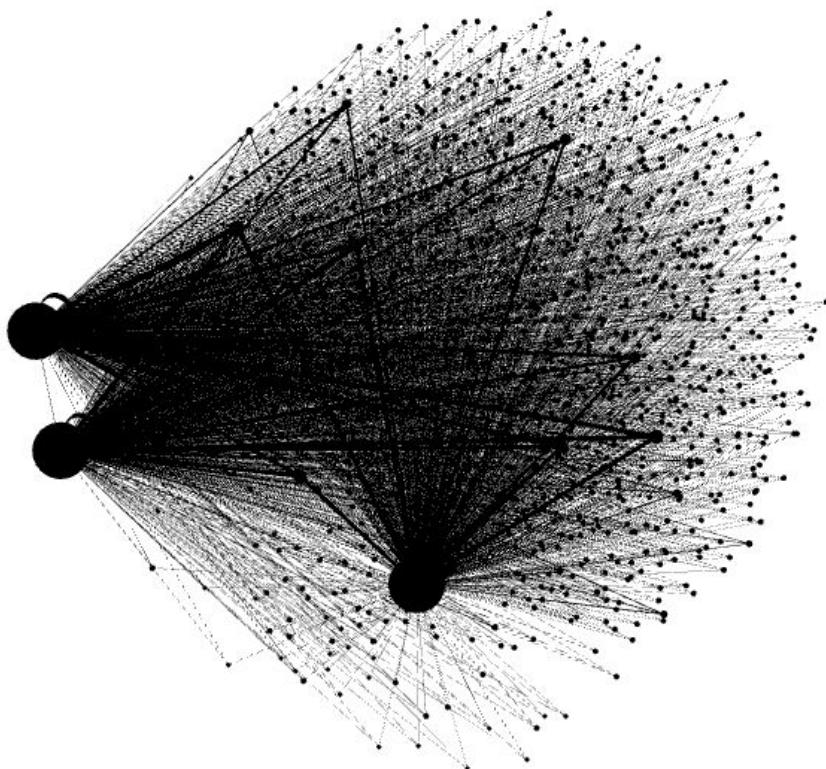


# Lesser Known Anime - Important Nodes

Node	Fandom
46	Haikyuu!!
55	Supernatural
47	原神   Genshin Impact (Video Game)
36	Naruto
40	Supernatural
57	Avatar: The Last Airbender
262	Hannibal

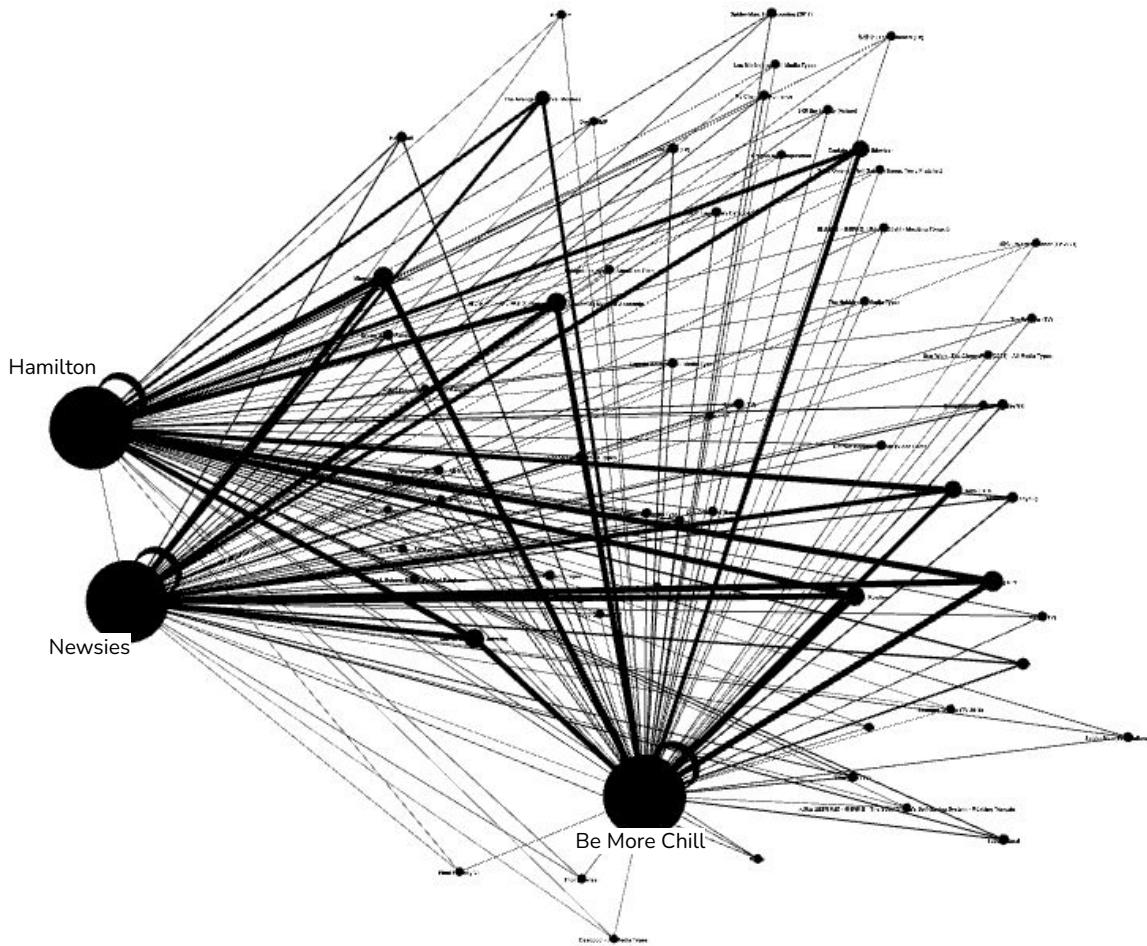


## Musicals - SNA



Musicals are less popular than other fandoms.

Are the readers in Musical fandoms more likely to bookmark less popular fandoms?



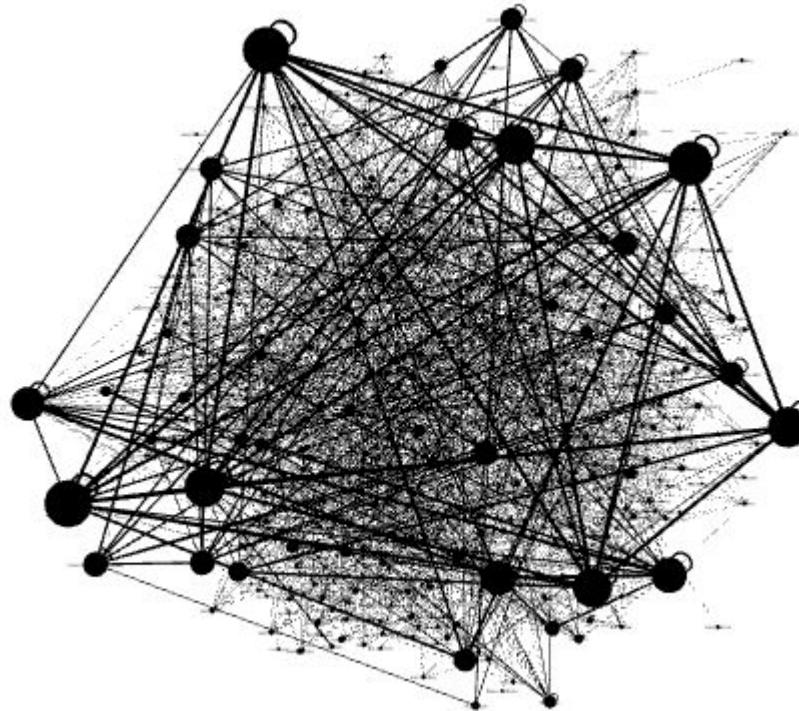


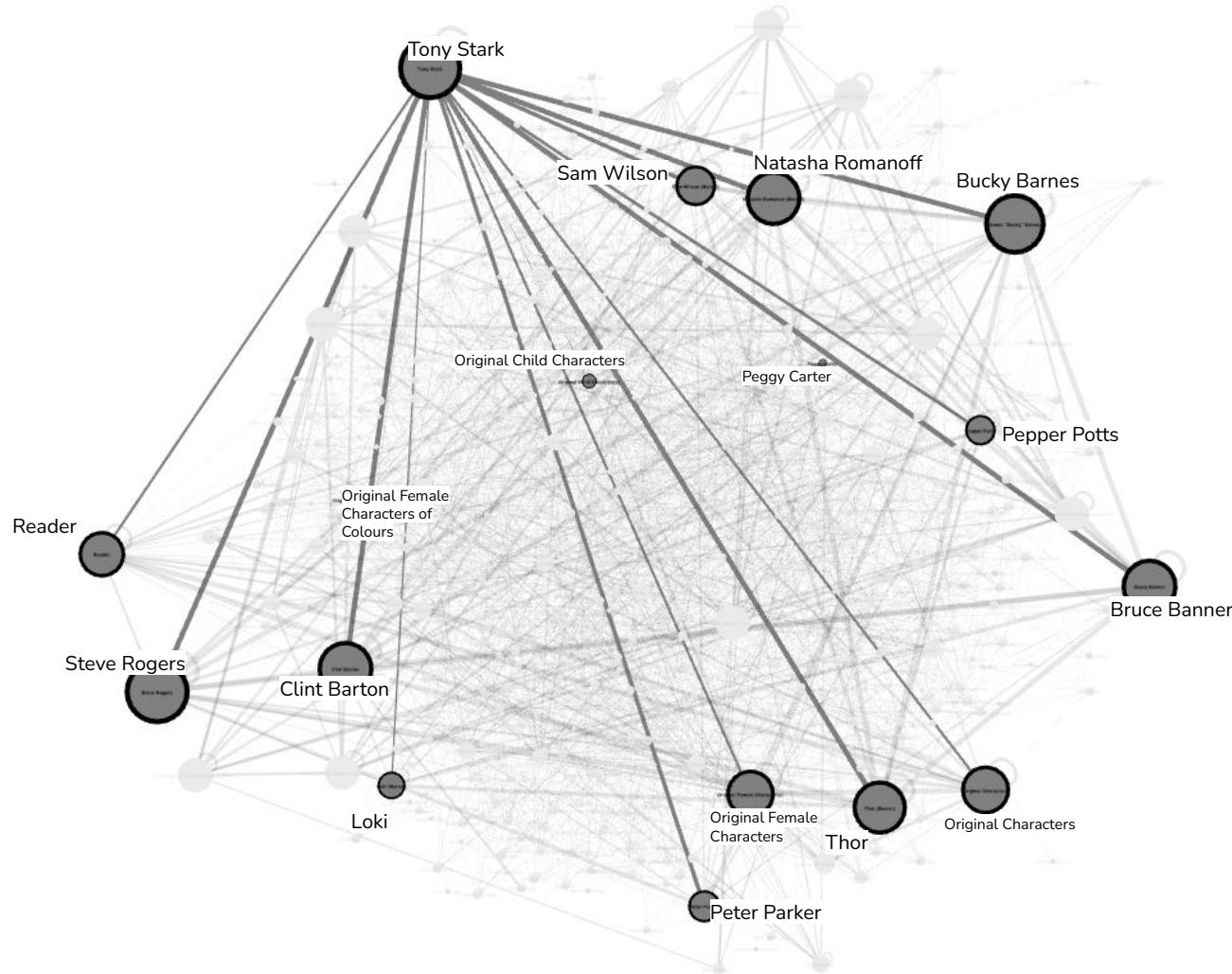
# Musicals - More Info

Node Groups	Fandom(s)
<b>Biggest</b>	<b>Hamilton, Newsies, Be More Chill</b>
<b>Second Biggest</b>	MHA, Minecraft, Video Blogging RPF, MCU
<b>Third Biggest</b>	Captain America (Movies), Harry Potter, BTS, The Avengers
<b>Fourth Biggest</b>	Naruto, Iron Man, Haikyuu!!, Sherlock, Supernatural, Teen Wolf, Genshin Impact, ATLA.



## Characters - SNA



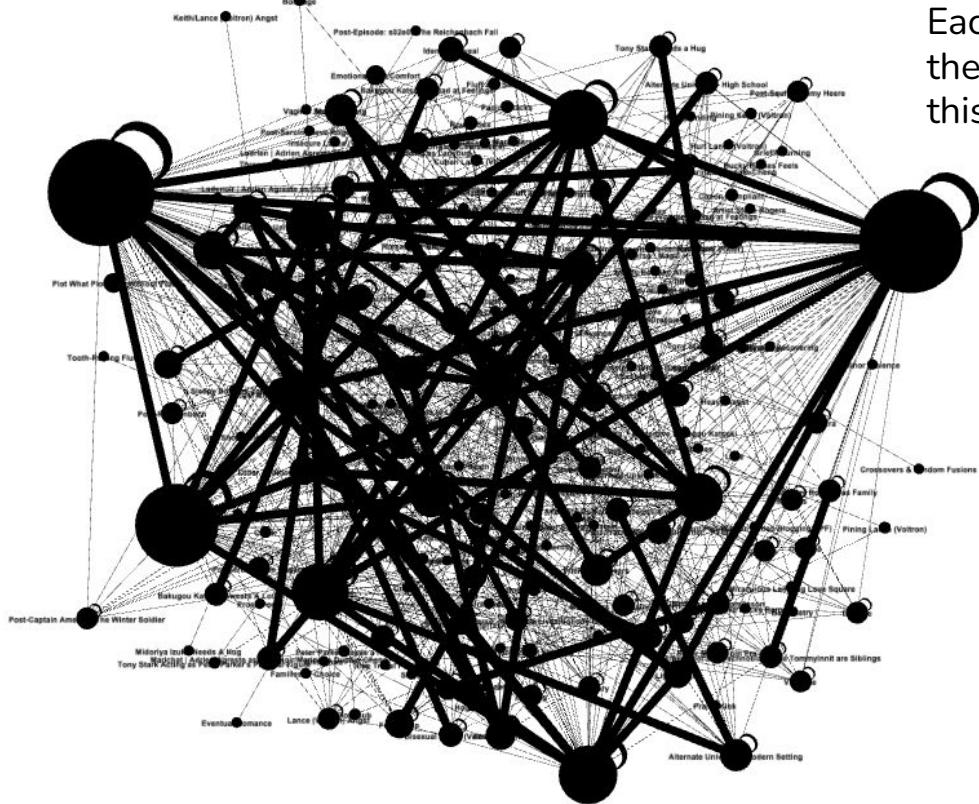




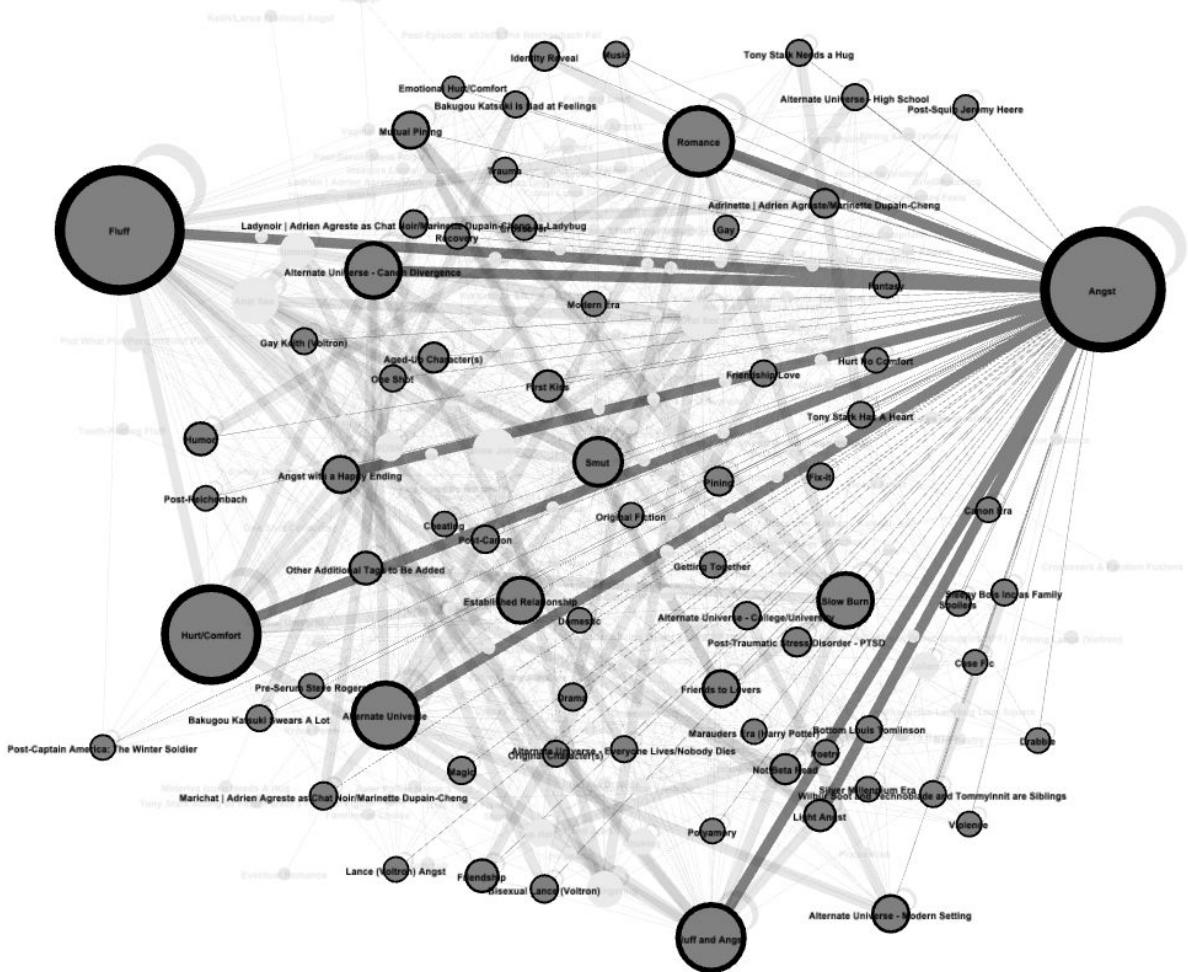
# Characters - More Info

Node Groups	Character(s)
<b>Biggest</b>	Tony Stark, Steve Rogers, Bucky Barnes
<b>Second Biggest</b>	Bruce Banner, Natasha Romanoff, Thor, Clint Barton
<b>Third Biggest</b>	Original Female Characters, Original Characters, Reader
<b>Fourth Biggest</b>	Minecraft RPF, Peter Parker, Loki, Original Male Characters, Band RPF Members, Dean Winchester, BTS, Harry Potter and more

# Tags - SNA



Each tag we scraped in the fandoms & the tags most commonly used with this tag

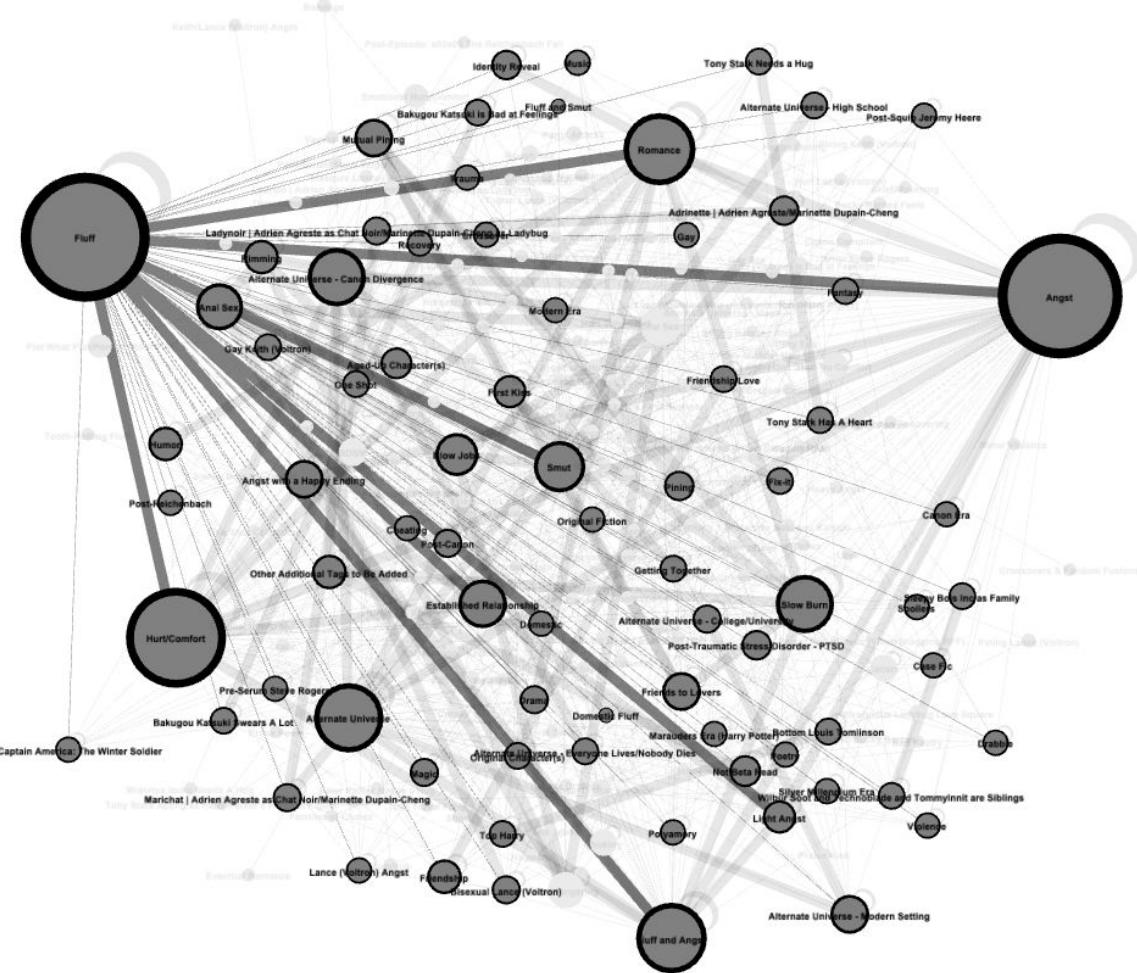


Most popular:

- Fluff
- Angst
- Hurt Comfort

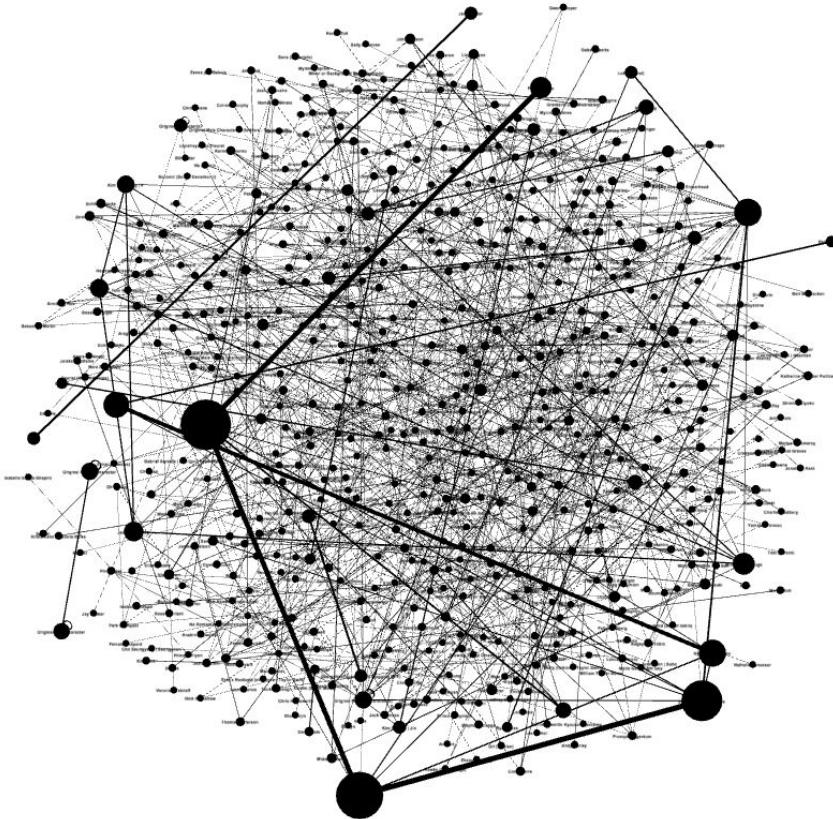
Starting to see **fandom specific tags**:

- *Tony Stark Has a Heart*

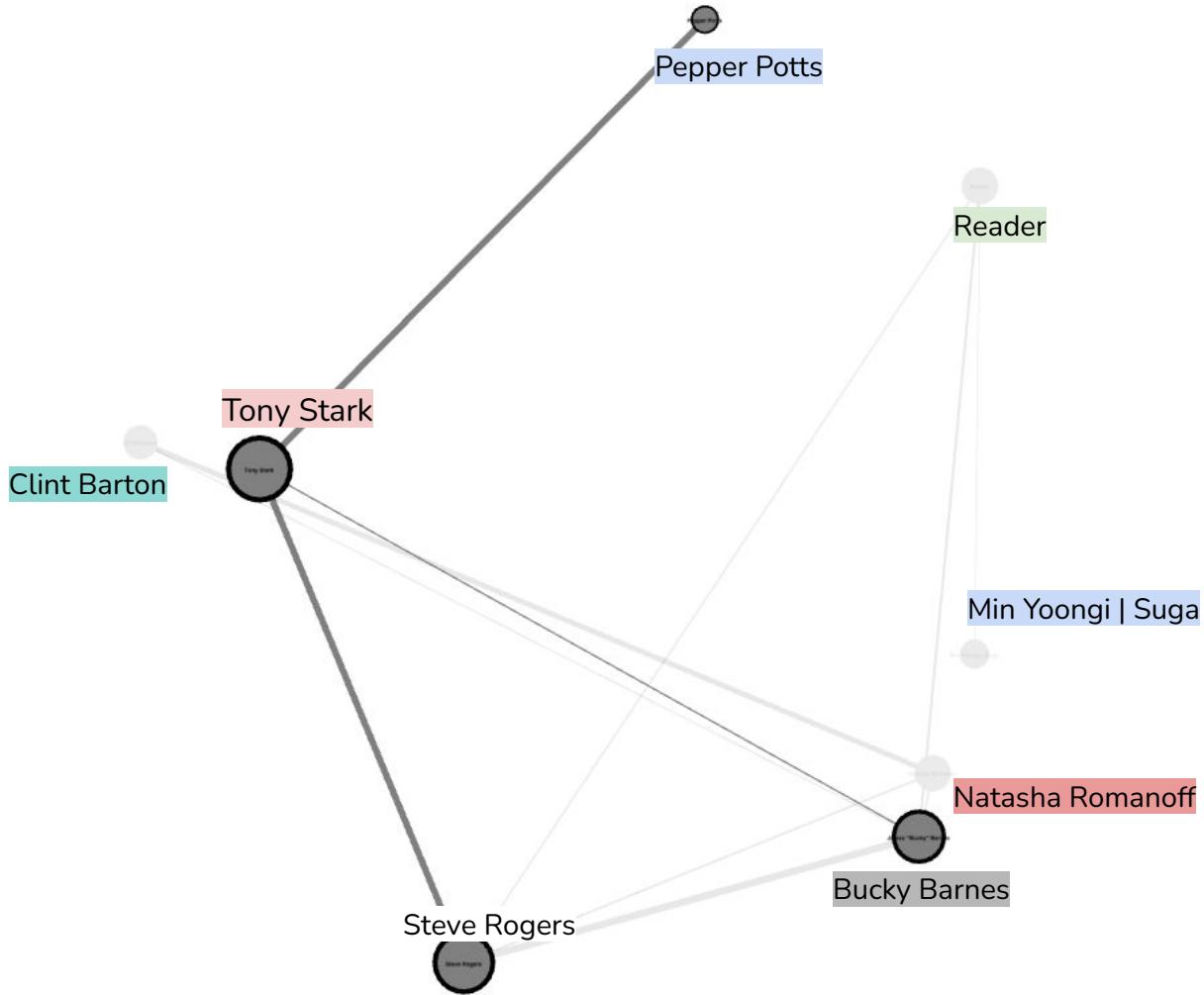




# Ships - SNA



Most popular ships in each fandom &  
Most popular ships for each character  
in the ship



# Results



# Initial Data Analysis

The most popular fandoms as a whole are **Marvel**, **RPF**, and **KPop**.

The most popular category is **M/M**, warning is **No Warnings Apply**, and rating is **Teen**.

The most popular tags are **Angst**, **Fluff**, and **Hurt/Comfort**.

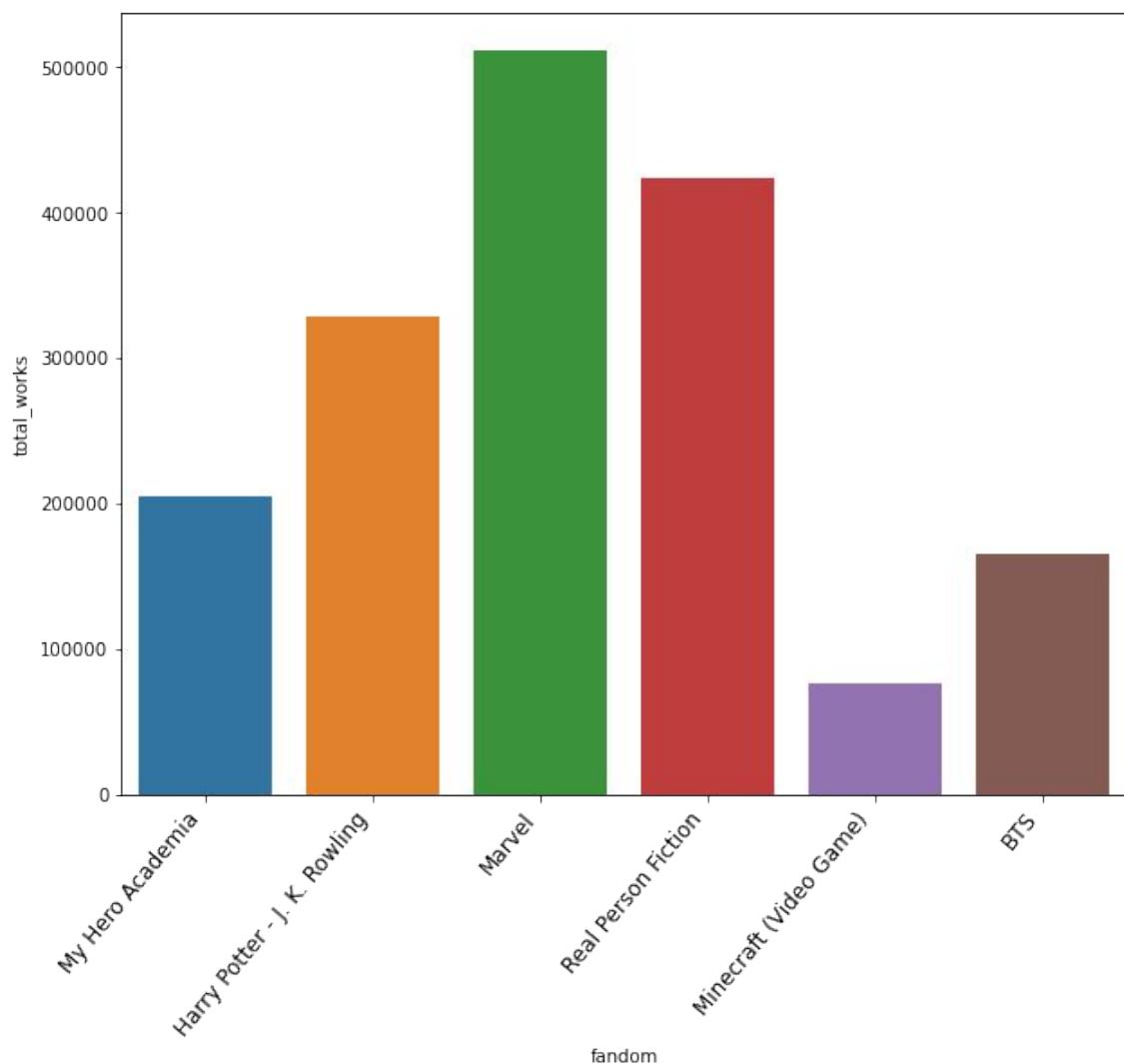


# Social Network Analysis - Fandoms/Fics

- Once reading a fic, a person is *most likely to read one of the popular fandoms on the sight*, regardless of which fics they start from
- If one starts *reading in the less popular fandom*, they are more likely to *stay within the same 'genre/category'*: i.e. Anima & Manga or TV Shows
- If one starts *reading in one of the most popular fandoms*, they are more likely to *explore different genres*

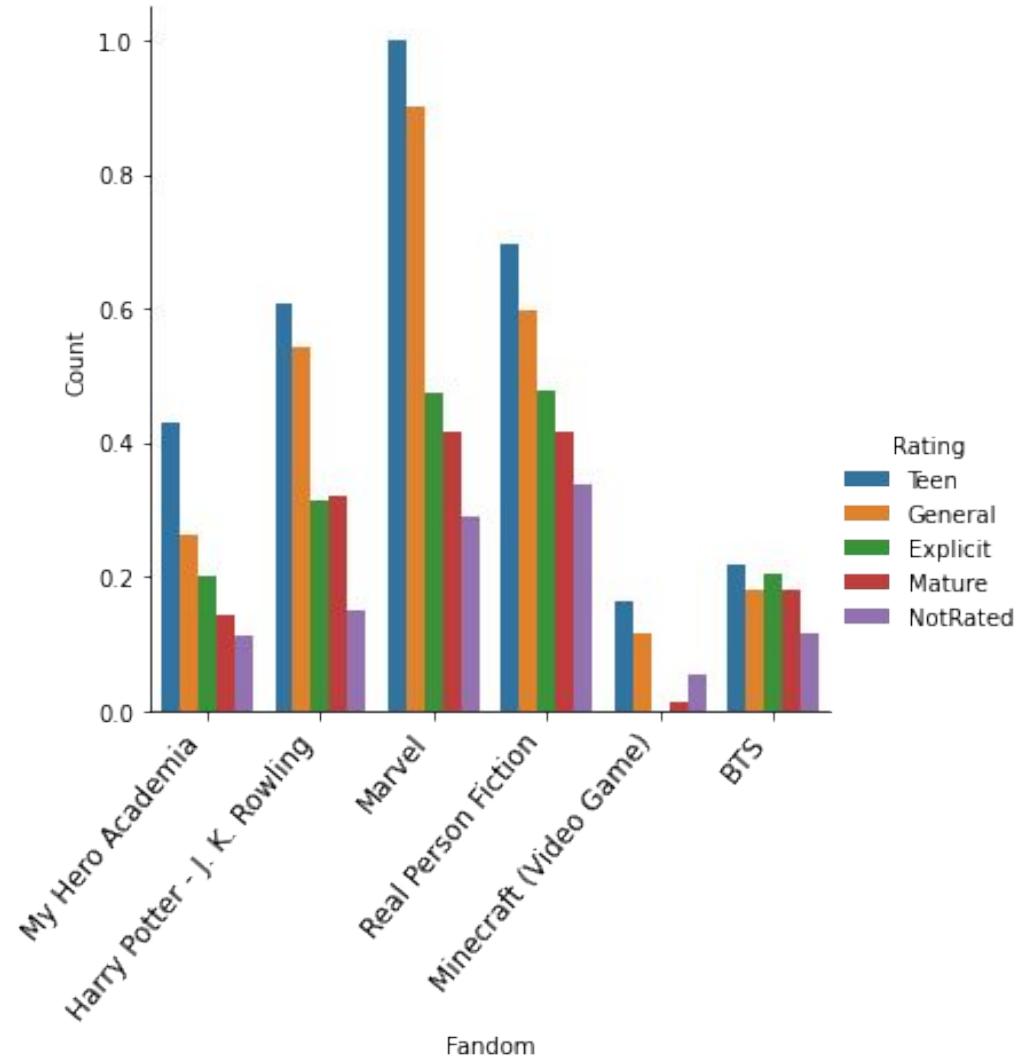
## Looking closely at 5 most popular fandoms:

Total works distribution



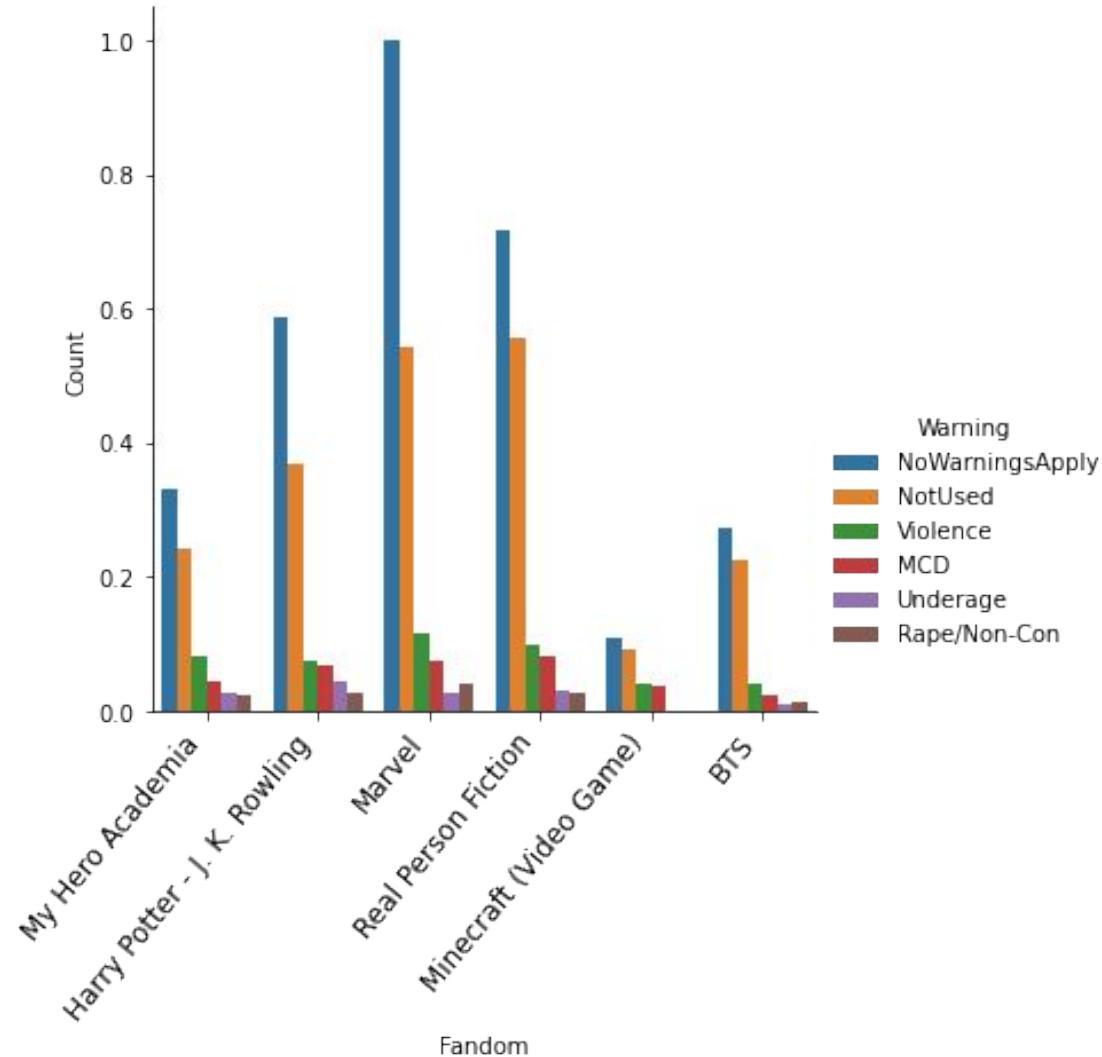
# Ratings?

- **Teen** is most popular, typically followed by **General** (by **Explicit** in case of BTS)
- Minecraft has a very low number of Explicit ratings



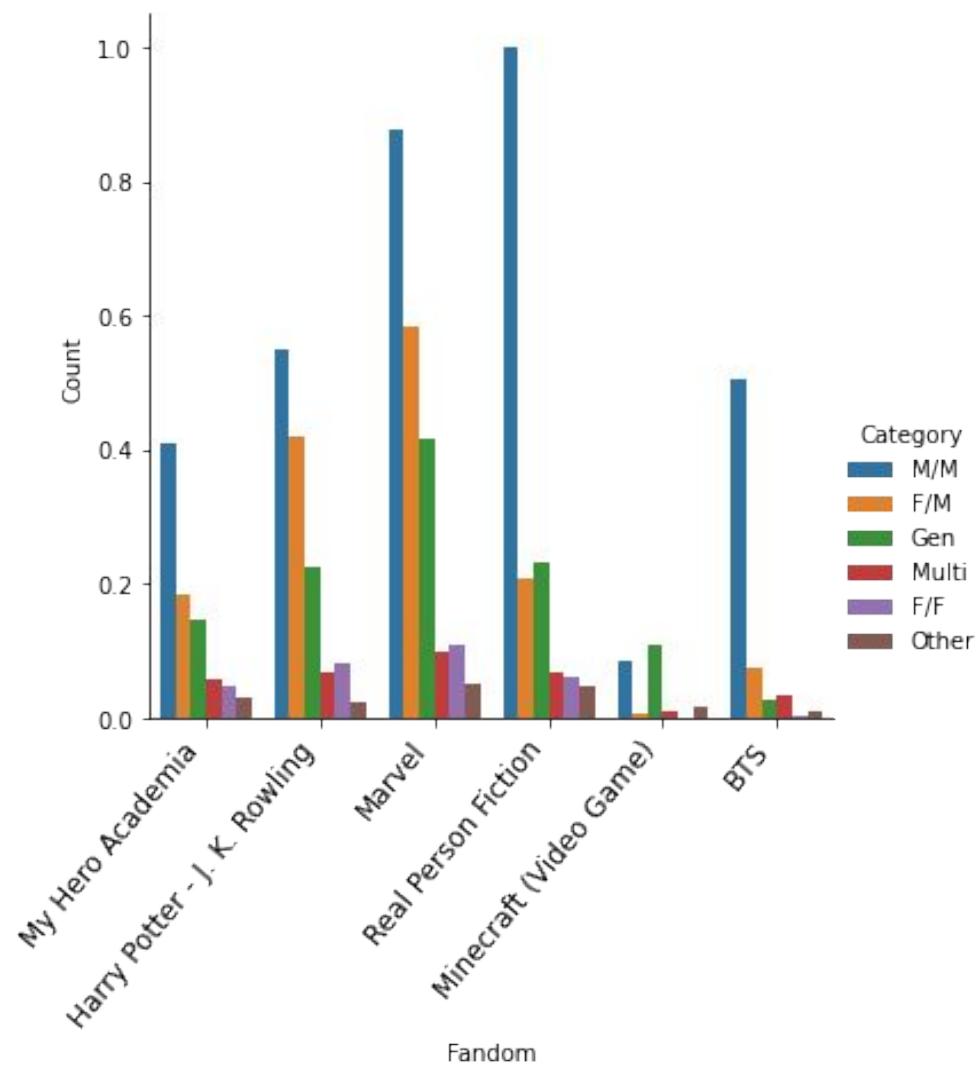
# Warnings?

- **No Warnings Apply** is most popular, followed by **Not Used**
- It is well known in fandom circles that authors and readers do not always know how to tag or when tags apply



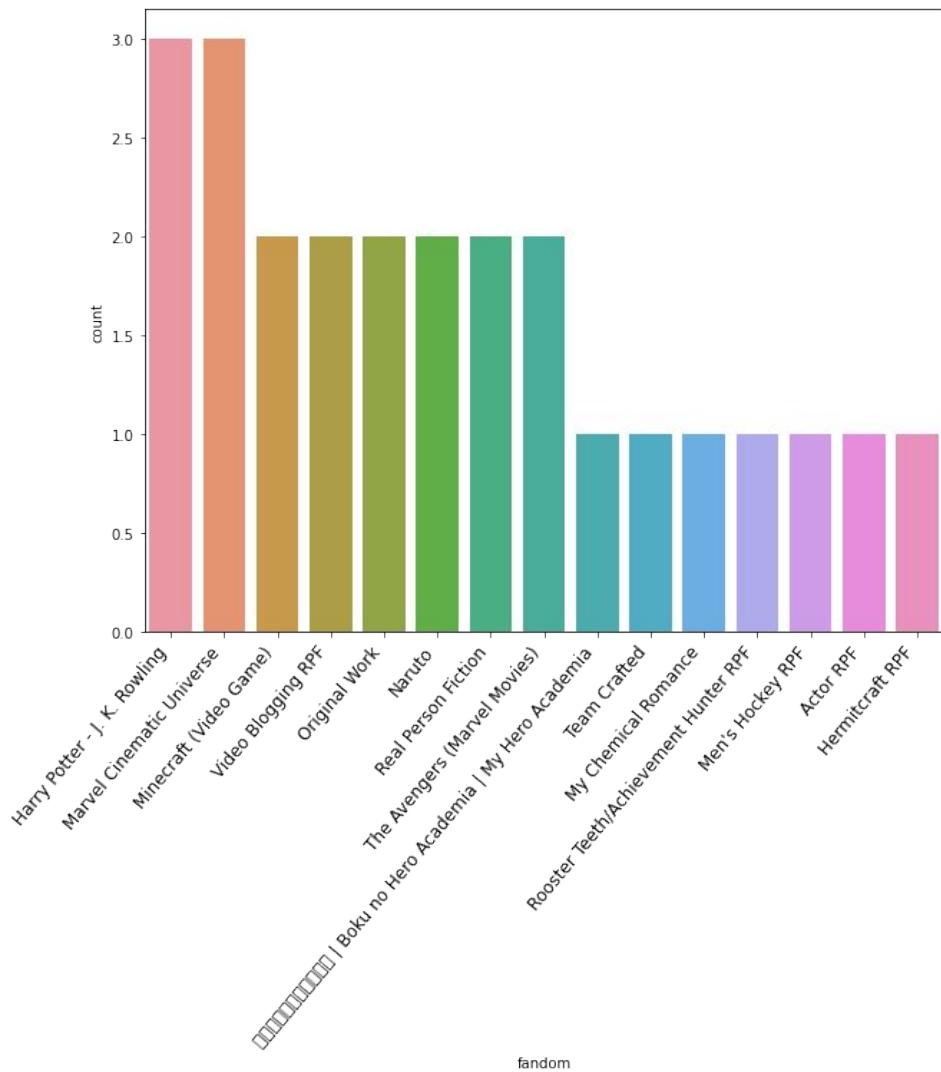
# Ship categories?

- M/M is most popular
- Female characters are not well developed/ canon material characters are mostly male



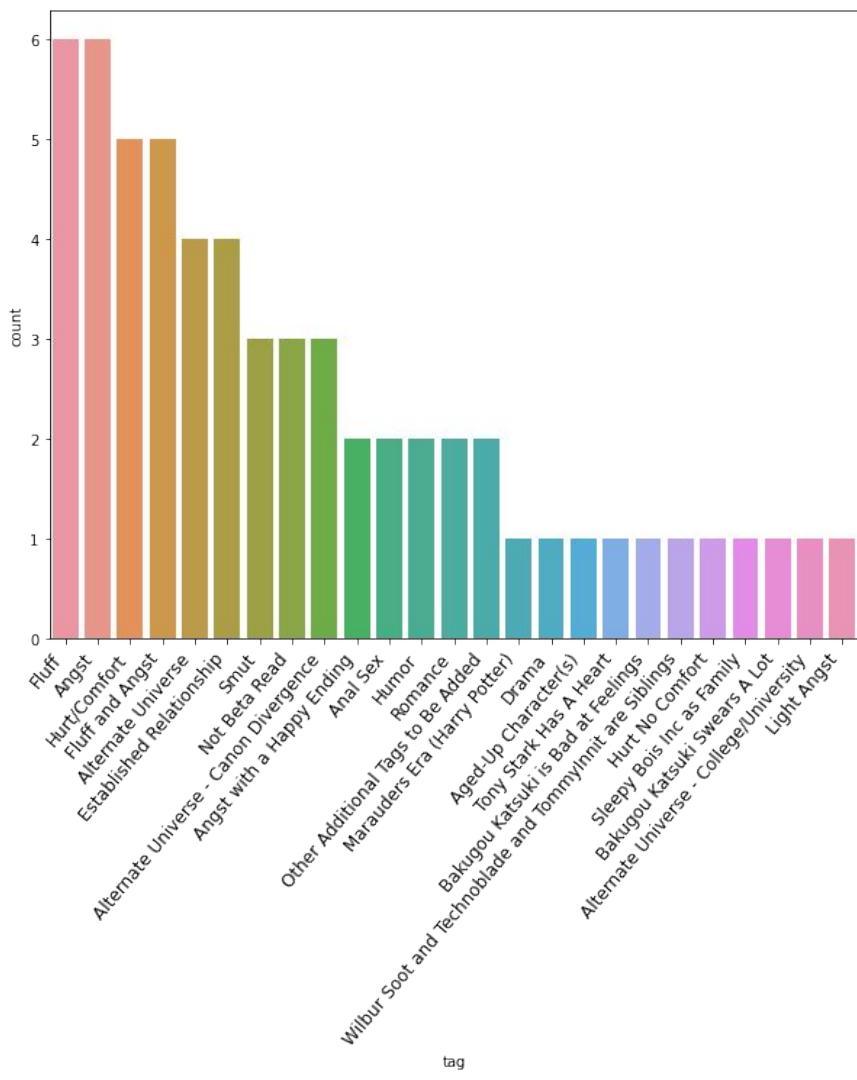
# Crossover count?

- Harry Potter and Marvel fandoms are most popular for crossovers

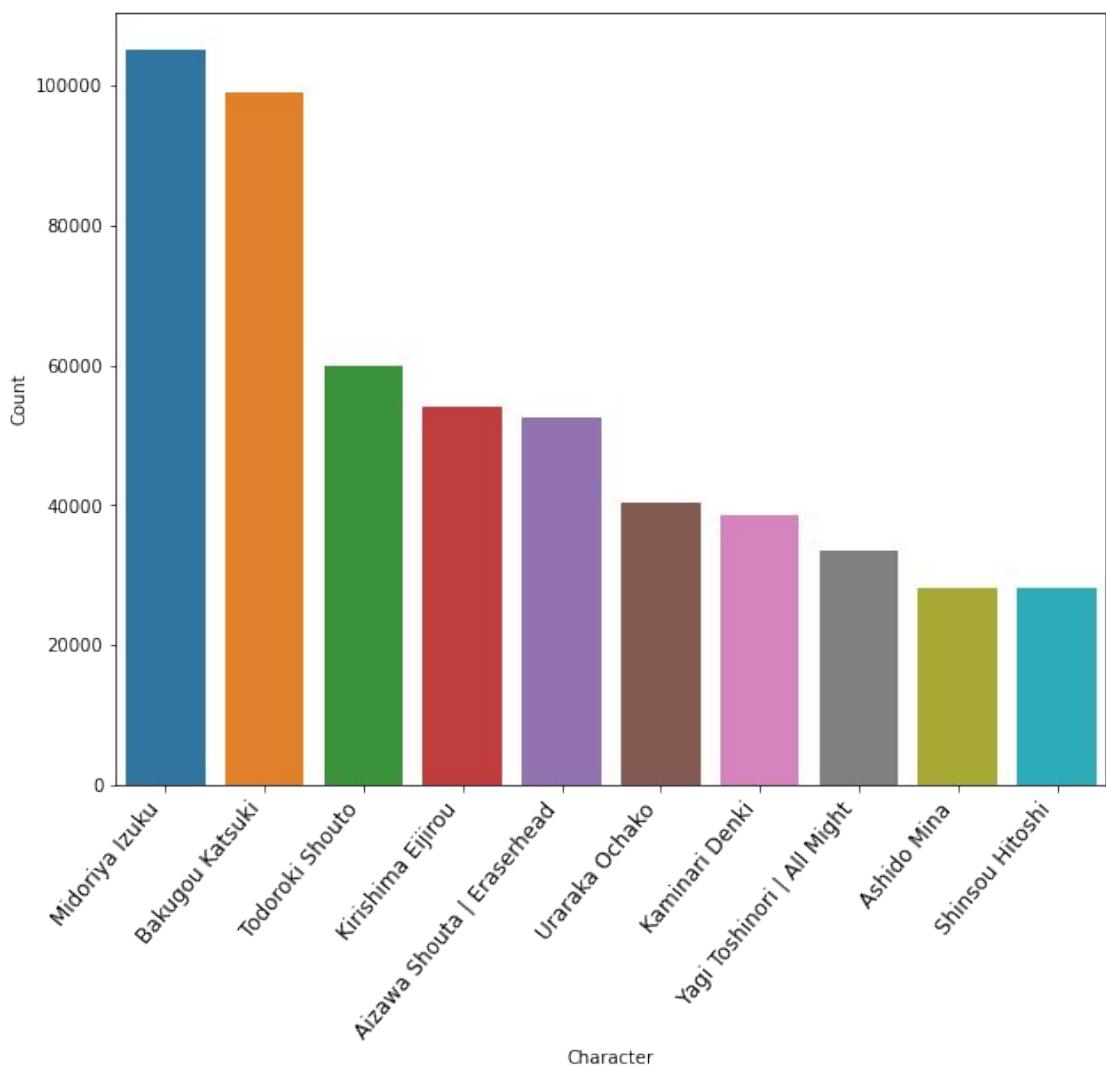


# Tags?

- Fluff is the most popular
- Due to canon material?



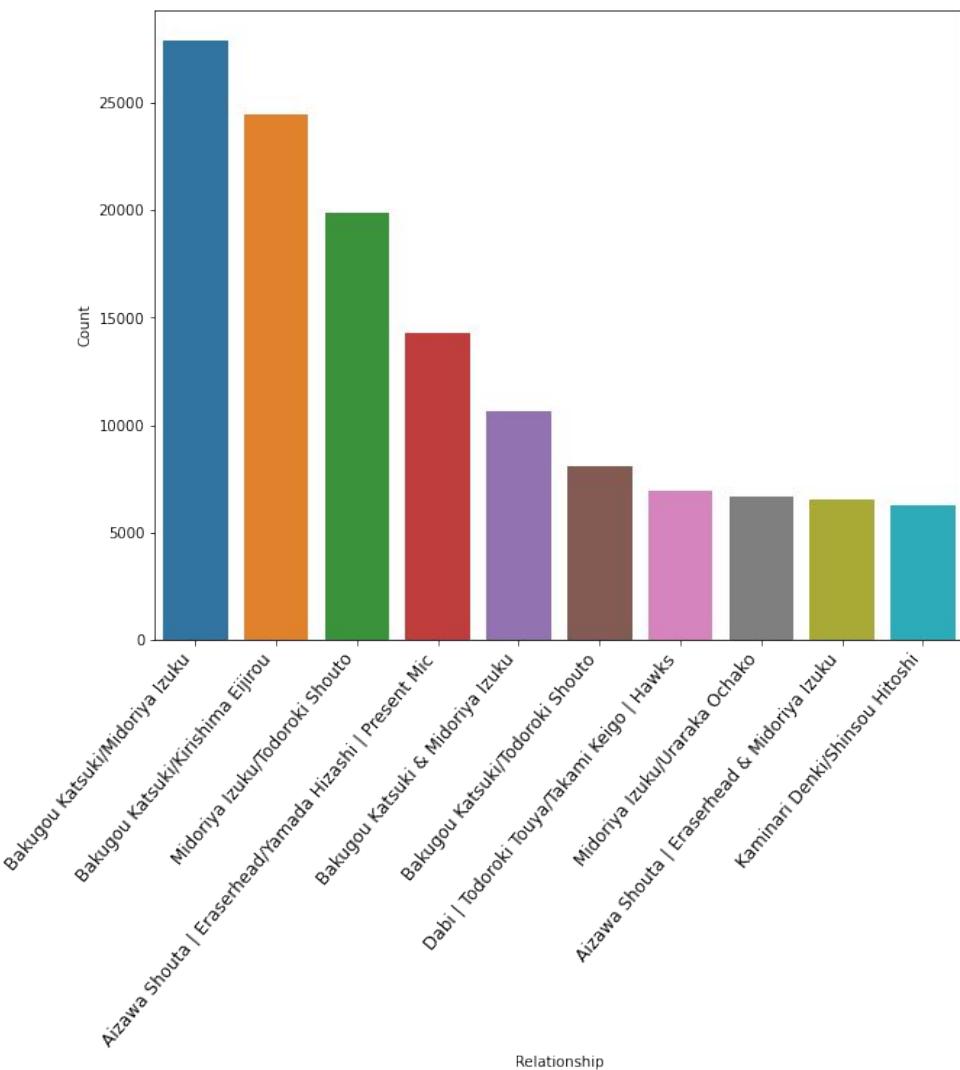
# My Hero Academia- Characters



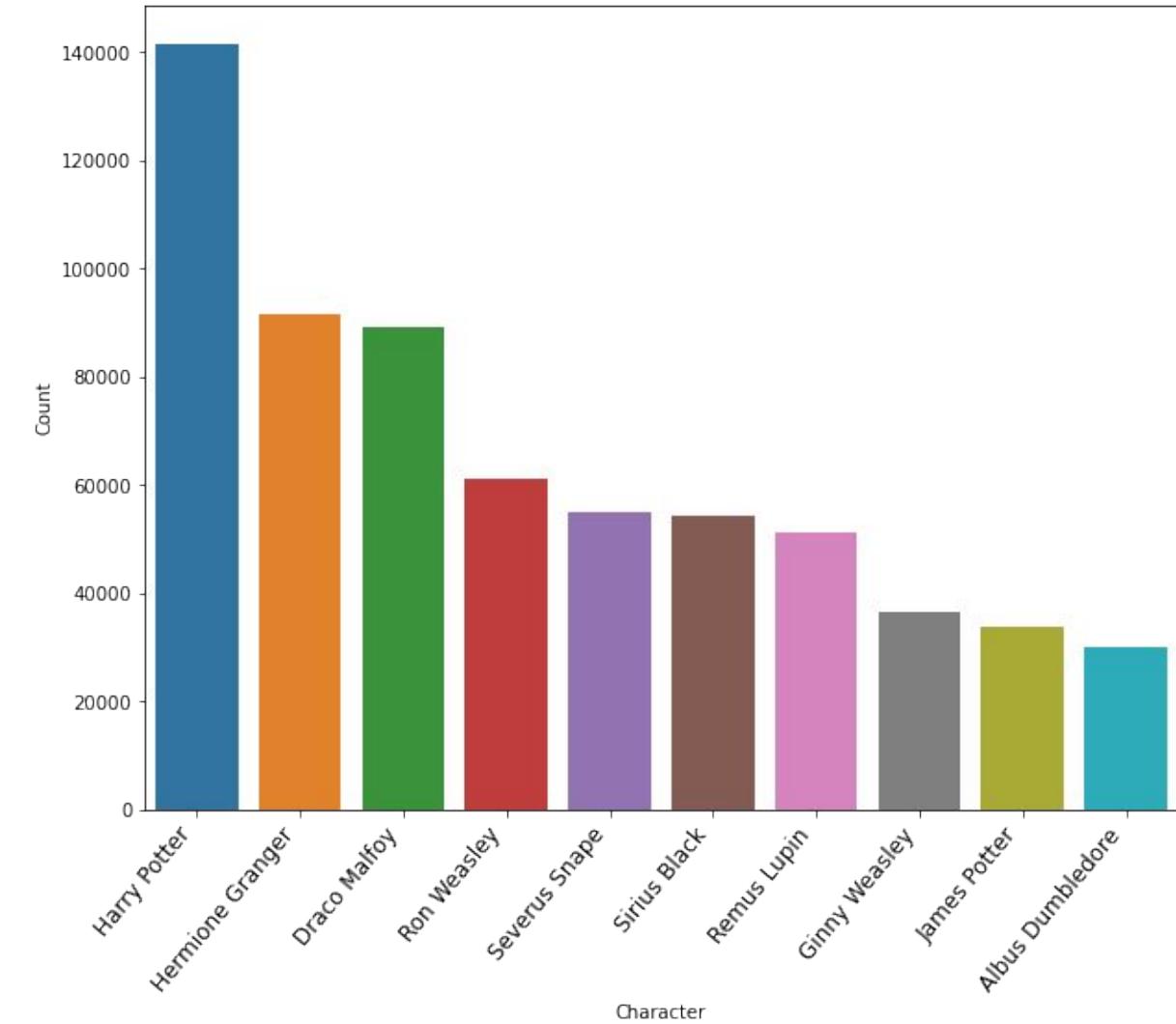
# My Hero Academia- Ships

Tropes within fandom:

- *Rivals/Enemies -> Lovers*
- *Man with anger issues X his emotional support himbo*
- *Silent stoic X Sunshine child*

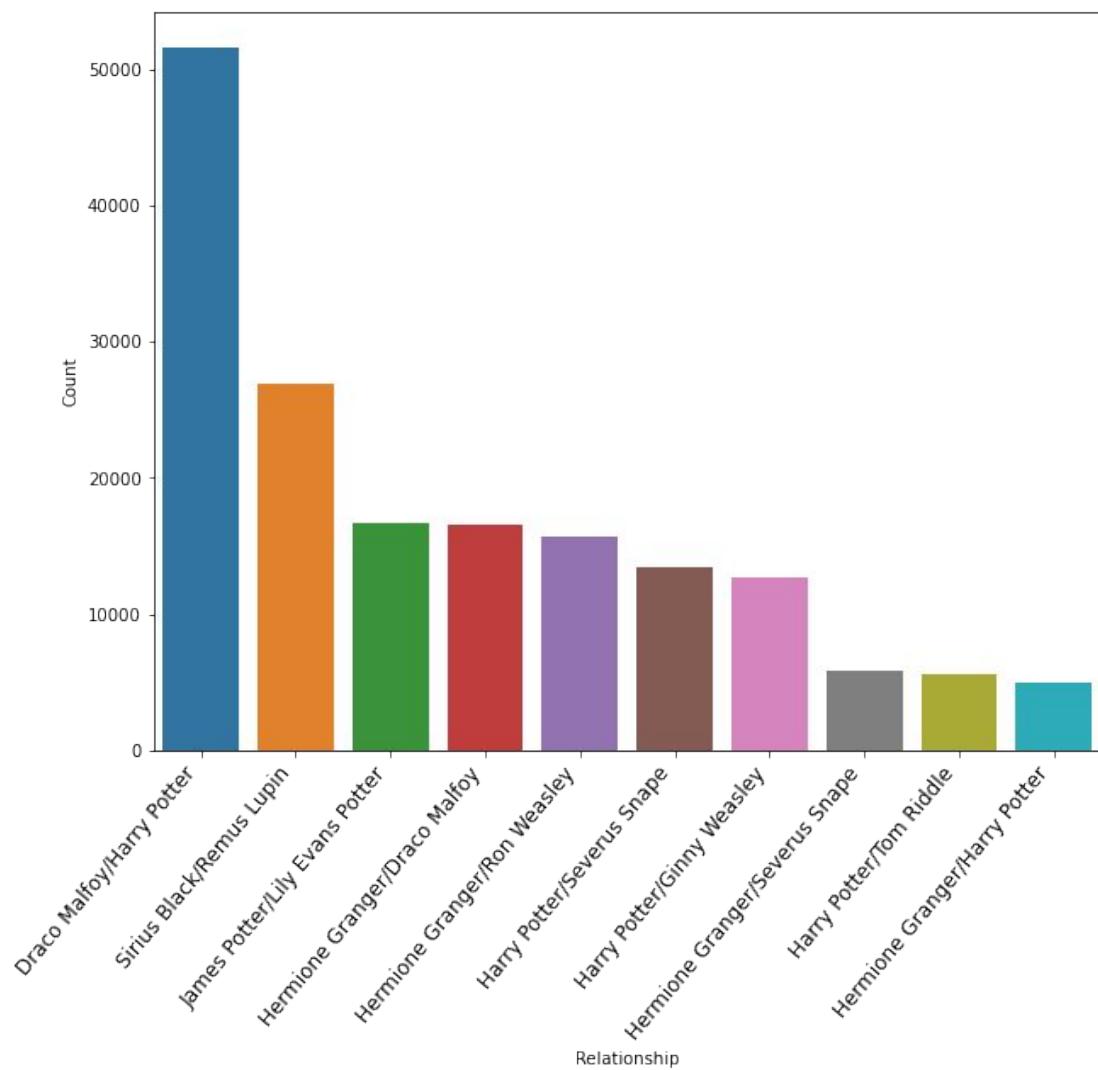


# Harry Potter - Characters

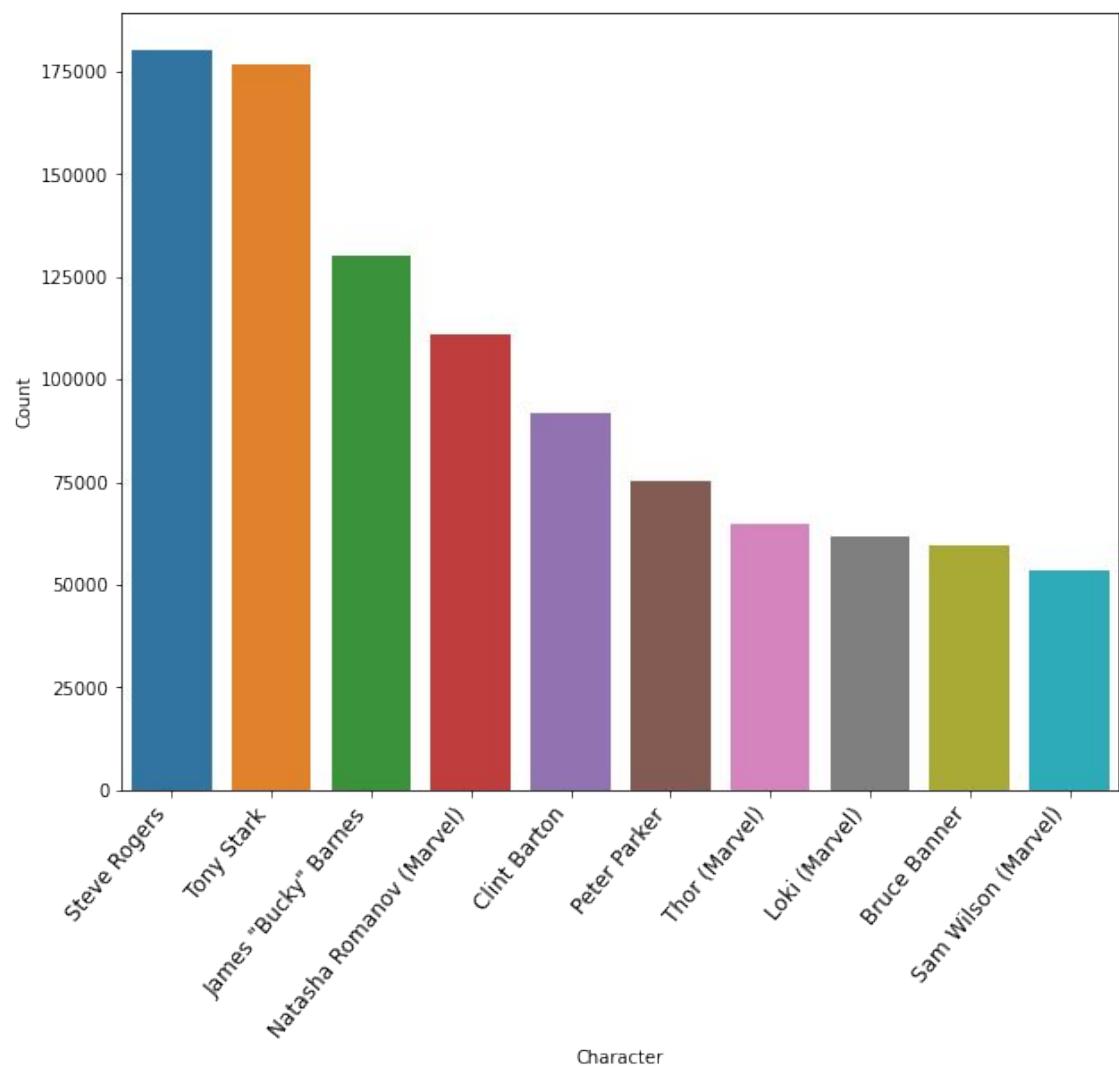


# Harry Potter - Ships

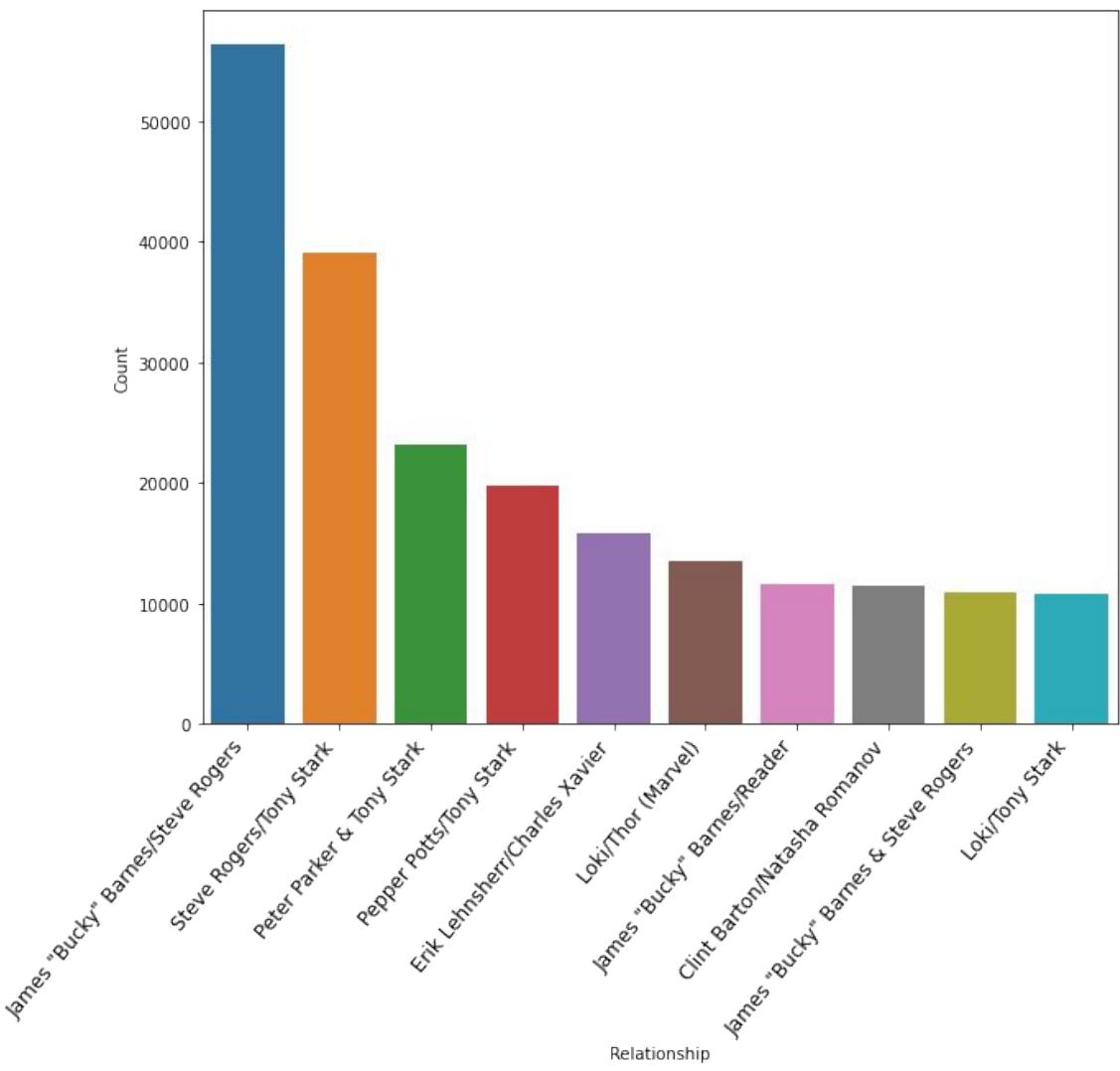
- *Drarry:*  
*Rivals/Enemies to  
Lovers*
- *Popular for AUs based  
in Hogwarts, multiple  
fanfic tropes unique to  
the fandom*



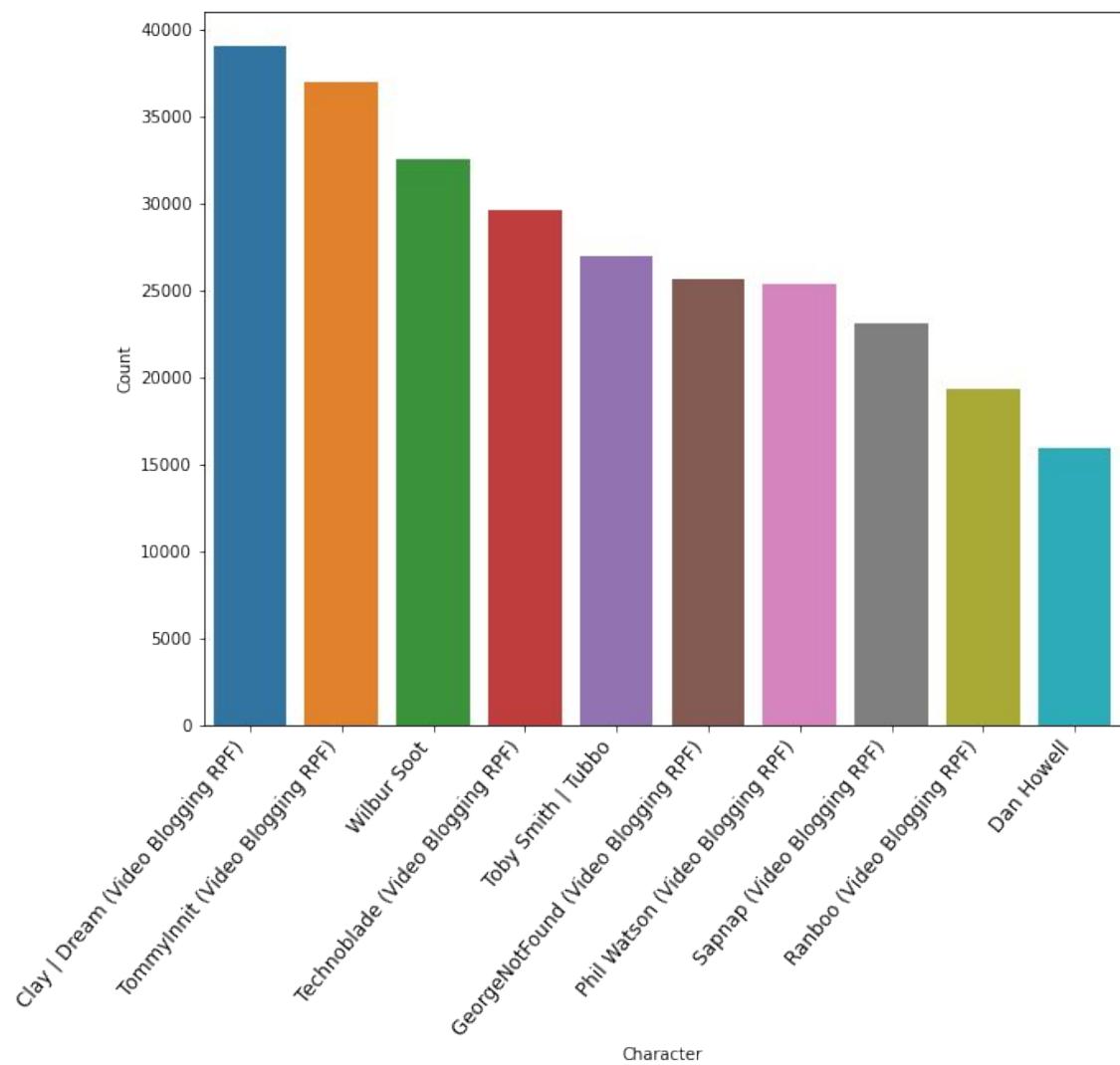
# Marvel - Characters



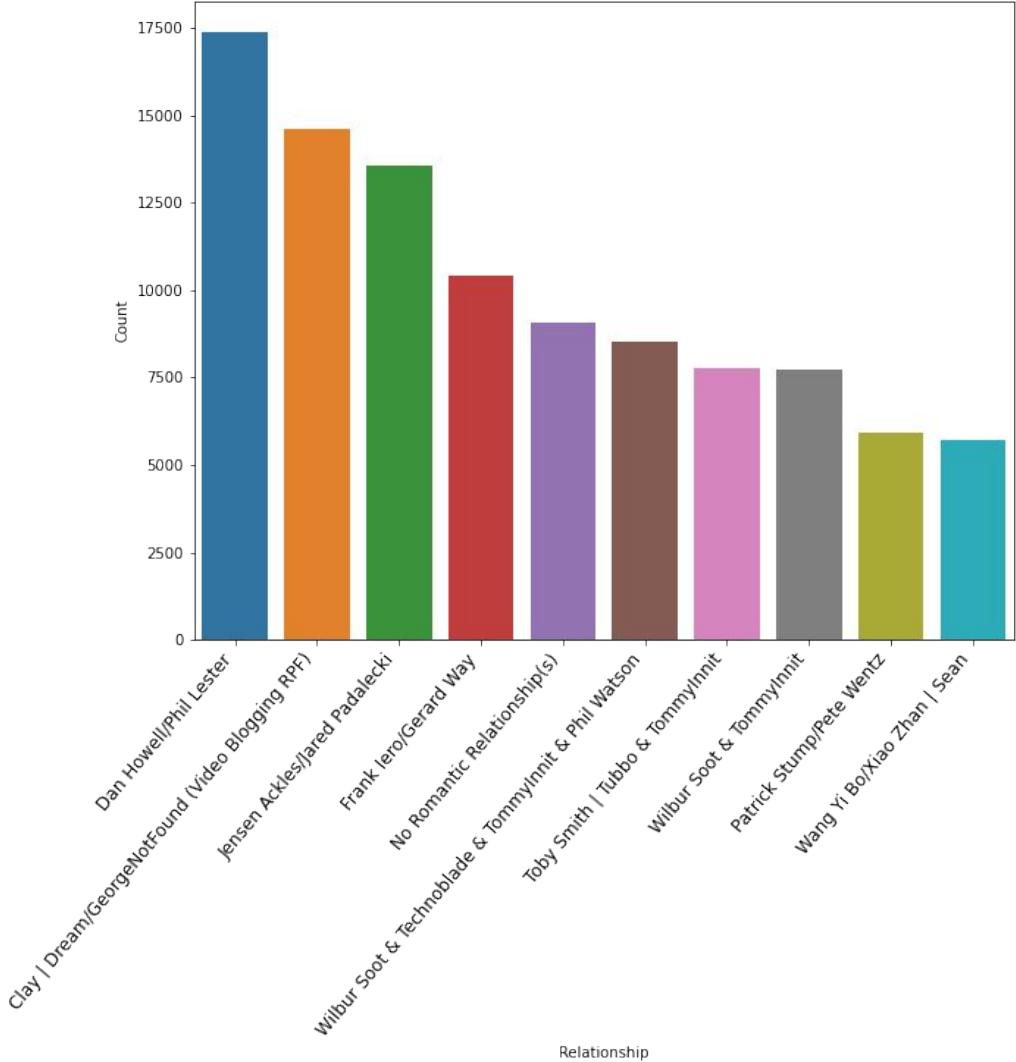
# Marvel - Ships



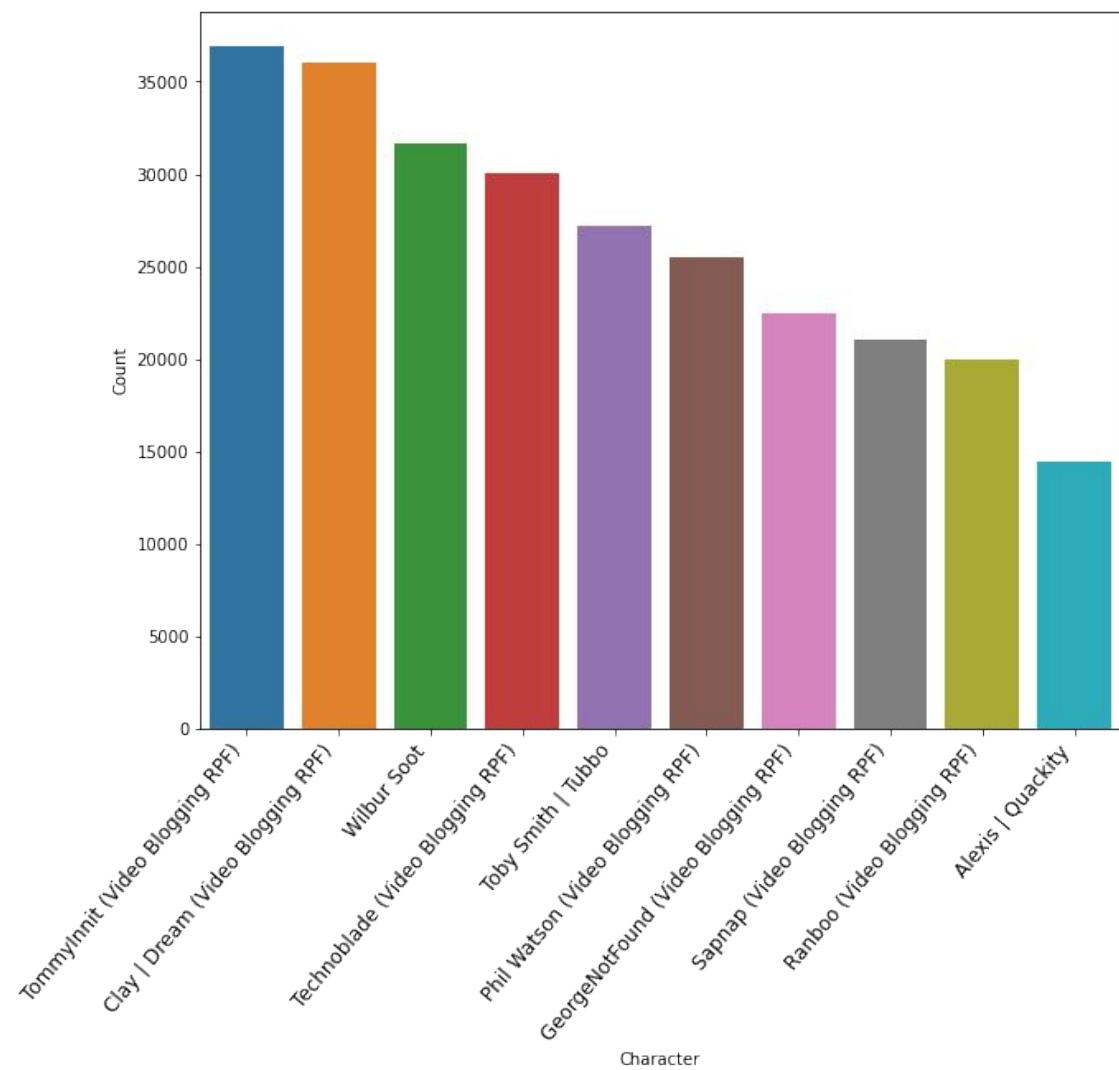
# RPF - Characters



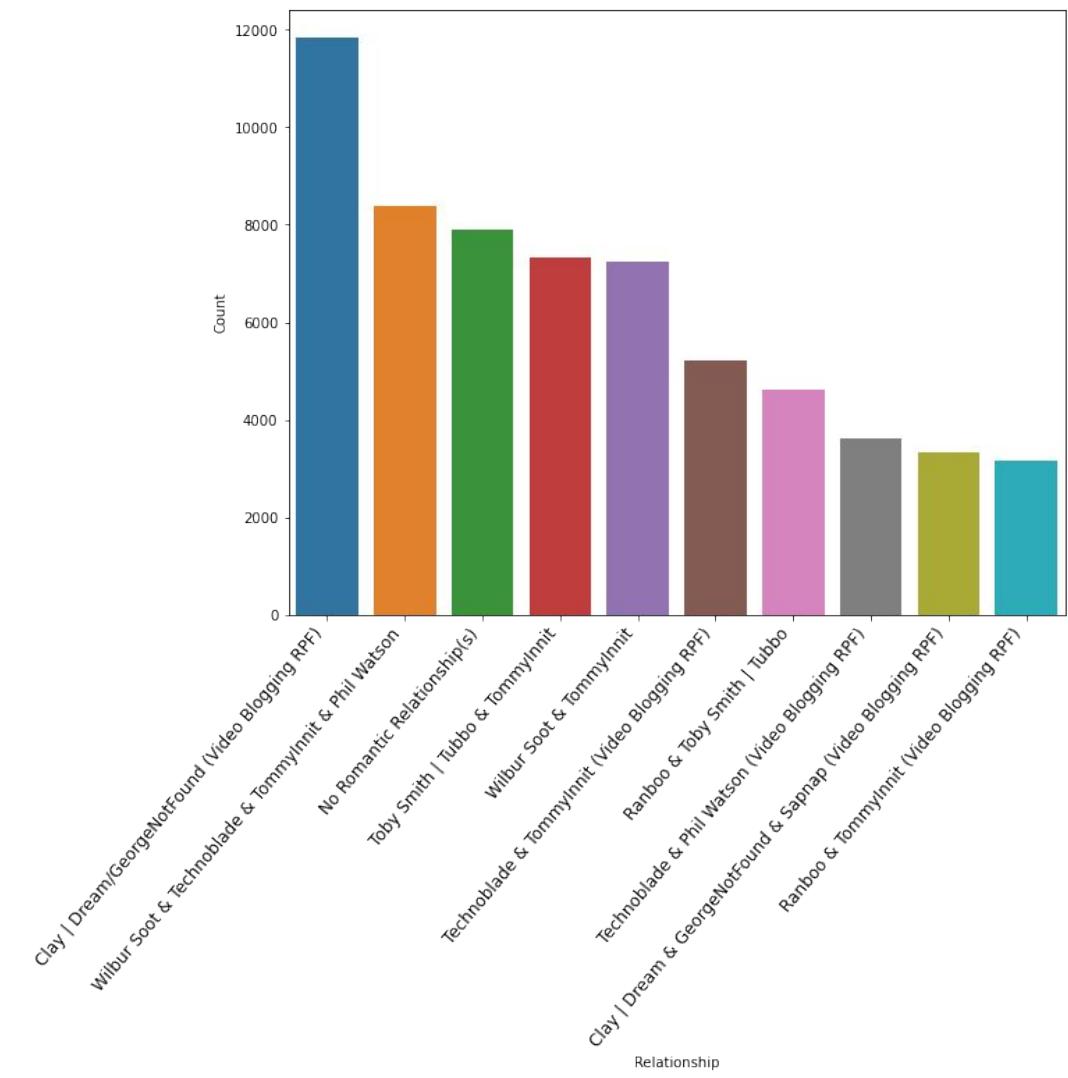
# RPF - Ships



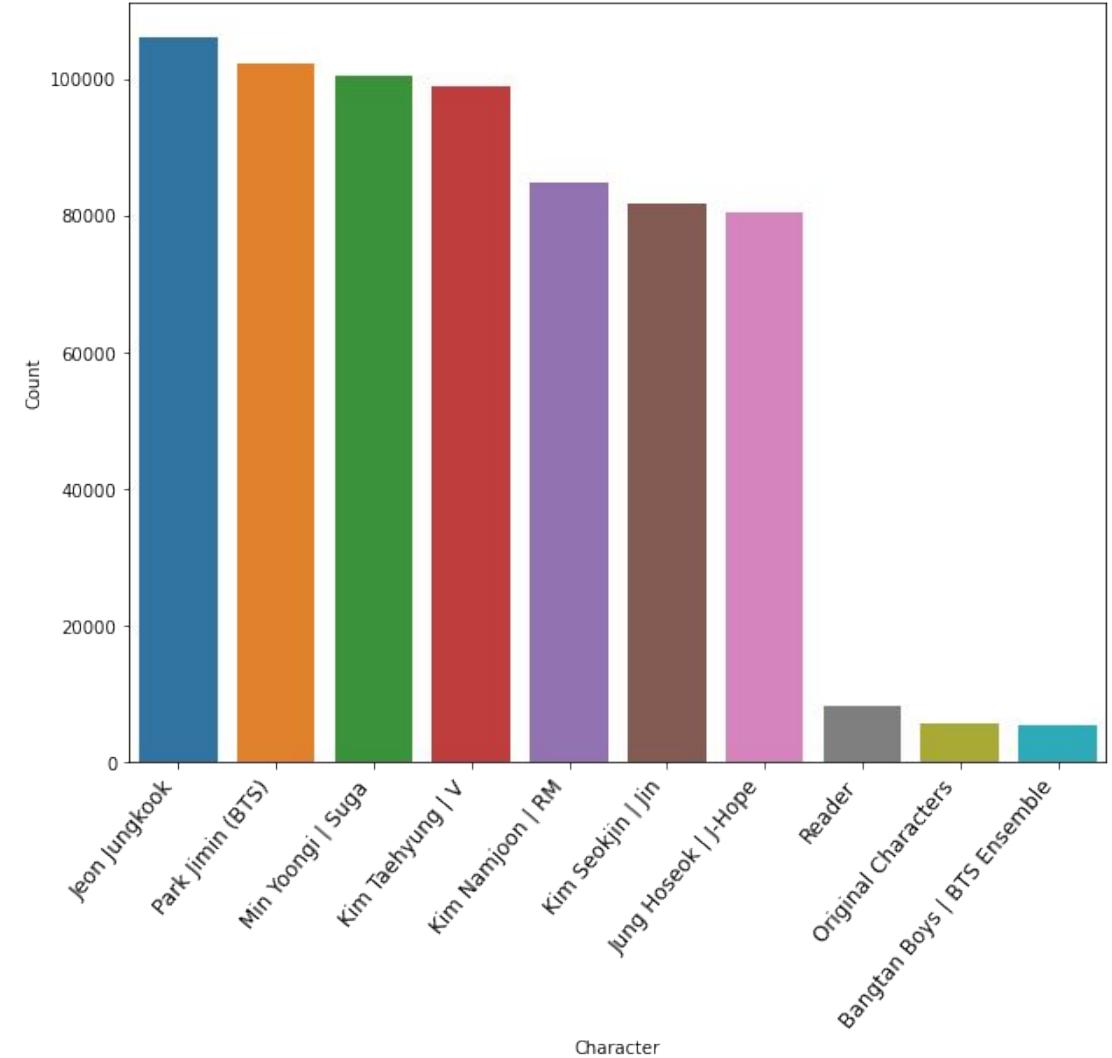
# Minecraft - Characters



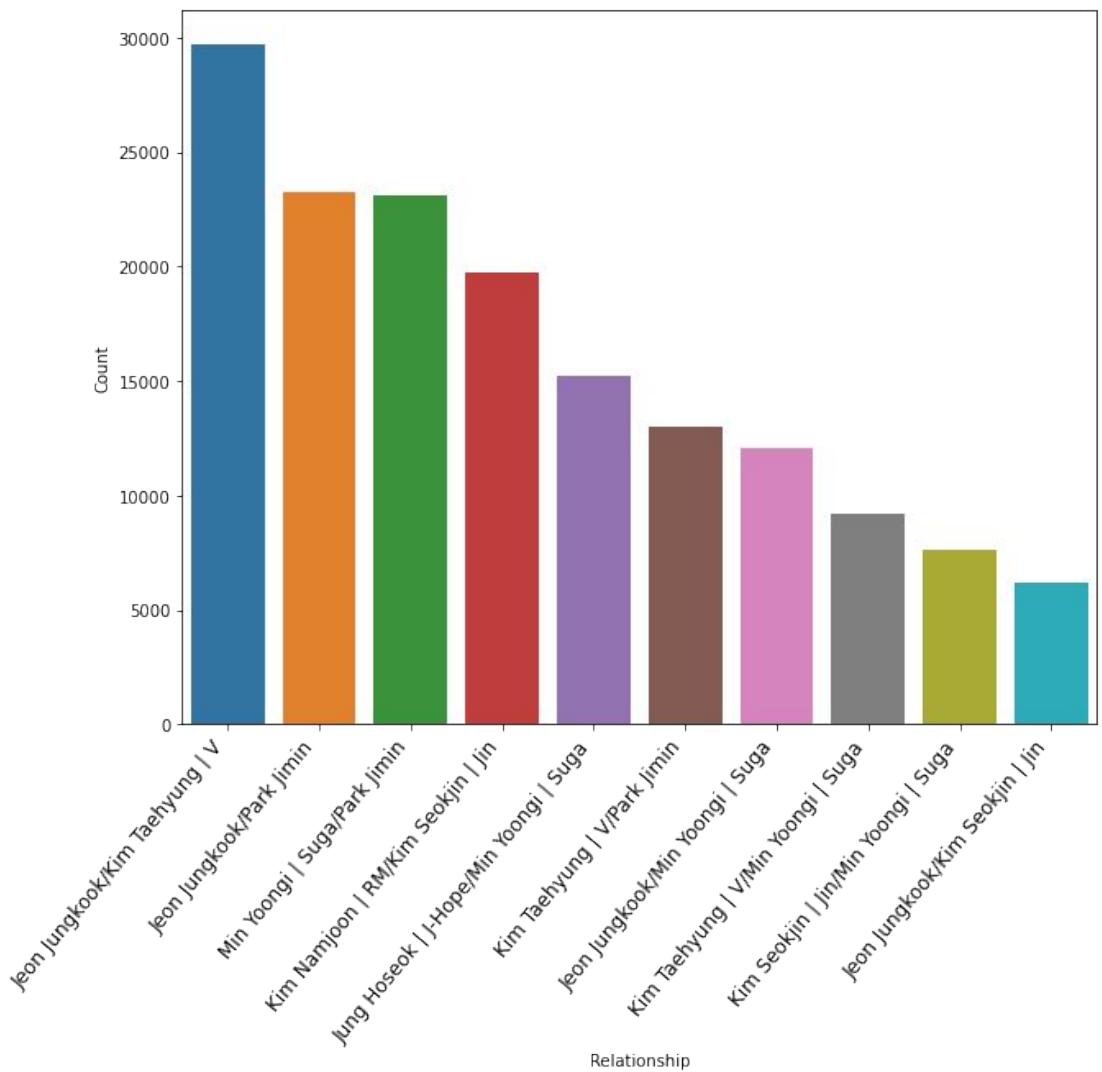
# Minecraft - Ships



# BTS - Characters



# BTS - Ships





# Why Are These Fandoms Popular?

The most popular fandoms tend to fall into one of two categories:

- **Heroes** (or heroes journey's arcs) ie. Harry Potter, My Hero Academia, Marvel
- **Real Person Fiction**, ie. BTS, Minecraft etc.



# What Fics are Most Popular?

We have found that in general, fics that are **M/M**, **Teen**, and that **No Archive Warnings Apply** tend to perform the best.

Fics with **Angst** or **Fluff** are very popular, closely followed by **Hurt/Comfort** and **AUs** in general.

# Feedback



# How Did We Get Feedback?

- We got feedback through the use of google forms sent to those we know that have insight into fandom and spread across our social media accounts involved with fandom.
- We currently have feedback from 5 people but are aiming to get more.



# How Did We Evaluate Our Results?

- We evaluated our results by confirming them with general statistical analysis as well as looking at the fandoms in general and ensuring that our results match what we would expect.

# Group Roles



# What Roles Did We Play?

Task	Owner	Completion date
Finishing the scraper	Team	November 1
Initial general data analysis	Emily	November 12
<b>Mid-project milestone report</b>	Team	November 15
Social network analysis report	Tatiana	November 25
<b>Project presentation/demo</b>	Team	November 30, December 2
<b>Project report</b>	Team	December 7

# Main Takeaway



# What is the main takeaway?

Our main takeaway is that fans enjoy reading M/M, Teen, Fluffy or Angsty fics within popular fandoms that do not require archive warnings, even if they started reading fic within a more unpopular fandom.

However, in order to develop a more certain and comprehensive takeaway as to why these fandoms are so popular; why people read fanfiction; and the habits of fanfiction readers will require more research.