



# Peer Production Seminar

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Final Report

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## **1. Abstract**

We have chosen to explore the Reddit community. Reddit is an American social news aggregation & discussion website. "Reddit is home to thousands of communities, endless conversation, and authentic human connection" (Reddit, about page). The website is open for all, and it offers member registration for free to post content or comment. According to Alexa, Reddit is the 17<sup>th</sup> most-visited website in the world. It was founded by Steve Huffman, Aaron Swartz, and Alexis Ohanian. The company, which bears the same name as the website, generates revenue through advertising and an ad-free premium membership plan (Investopedia, Reddit). The community is made up of sub-forms (subreddits), each with its unique features, size, and style. Each Subreddit has moderators who manage the community. The primary issue we focused on is the quantitative investigation of the involvement of moderators within their communities.

In this project, we will start with an introduction to Reddit's community in section 2, categorize the community in section 3, review its key issues in section 4, deliver an overview of the community's secondary issues in section 5, and give a detailed analysis of the primary issue we have chosen to focus on in section 6.

## **2. Introduction of the community**

### **2.1 What is being produced**

Reddit is comprised of subforums in which registered users can talk about almost any topic imaginable: news, pop culture, technology, comics, film, literature, and many more. There are two main types of submissions available in each subreddit: comments and posts. Posts, also known as threads, are opened by users and serve as the main topic of discussion. In each post, users communicate with each other by comments. Posts and comments can contain links, images, videos, and texts. With these tools, the community produces reviews, ask each other questions, share art, music, photos, films, express opinions, discuss different issues, etc.

### **2.2 Community members**

Reddit community consists of several types of members:

- **Redditor (Member)** - "average user" who signs and joins the website.
- **Verified Members** - users with an honorable mention which appears beside their username and visible to all. For example, the "verified physician" tag, as seen in the "AskDocs" subreddit, assigned to members who were verified by moderators as medical doctors.
- **Partial Moderator** - Moderators who hold partial privileges for the subreddit.
- **Full Moderator** - Moderators who hold full permissions for all the features of the subreddit.
- **Administrators** – Reddit's employees who are also a part of the community itself.

Details and expansion on Reddit's community members can be found in section 5.5 - "Coordination and Conflict Management".

## 2.3 Descriptive data

The idea and initial development of Reddit originated with college roommates Steve Huffman and Alexis Ohanian in 2005. Reddit — known as the front page of the Internet — is now one of the largest websites in the world with one of the most loyal communities online today, boasting over 1.6 billion page views each month. In 2006 Reddit was bought by Conde Nast (20\$ million), having 500,000 daily unique views. In 2008 Reddit added the ability to allow anyone to create their own subreddit, in the same year the framework of the website became open source. In December 2009, Reddit launched an advertising and promotion platform for advertisers. In February 2011, Reddit surpassed 1 billion page views a month, the average time on the site was 15 minutes 40 seconds. September 2011: 1.6 billion page views a month (fig. 1).

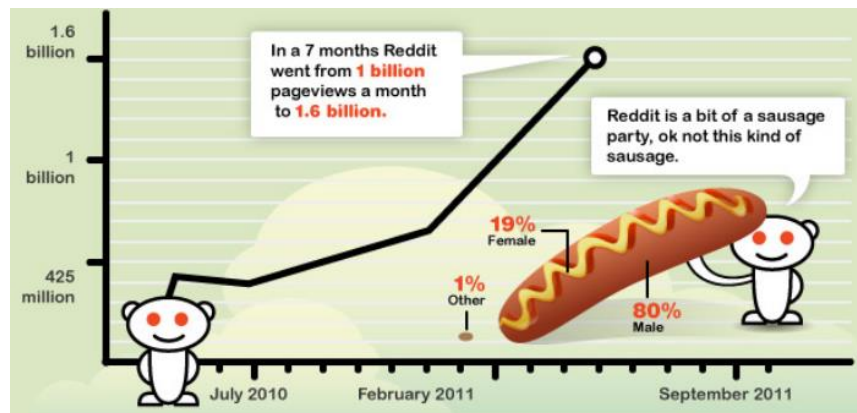


Fig. 1. Reddit page views

In 2018, Reddit experienced 21 Billion average screen views per month. In a blog post from the same year, Reddit stated that they had achieved one billion views per month for native video, surpassing the company's prediction (Reddit statistics, foundationinc). According to Comscore, 38% of Reddit users consider themselves technology enthusiasts, more than any other social platform (fig. 2).

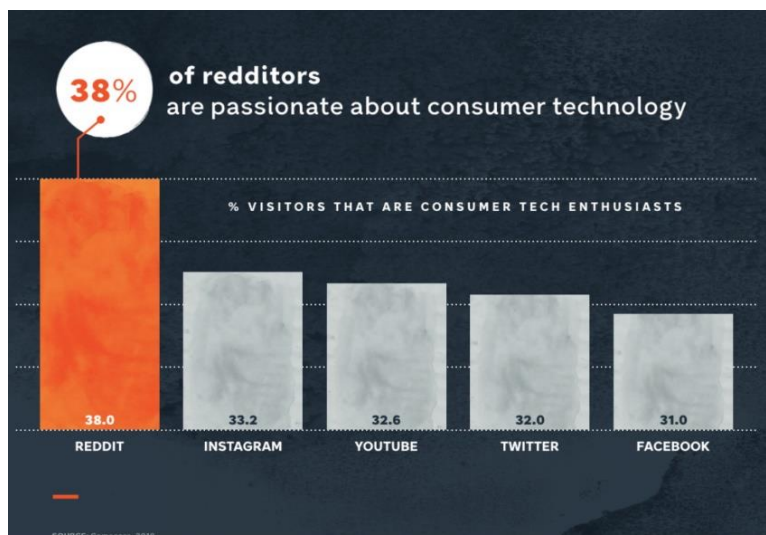


Fig. 2. Percent of tech enthusiast in social media platforms

Today (2021), there are more than 430 million active Reddit users worldwide. More than half (50.78 percent) of Reddit's desktop traffic comes from U.S. users, making it one of the most popular among English-speaking communities. Germany is the only non-English-speaking country to rank in the top five of incoming traffic from different countries, contributing to 3.14 percent of Reddit's total desktop traffic (Reddit statistics, oberlo). Today Reddit users spend on average 10 minutes and 23 seconds per visit on the site. It is the most popular among users aged 25 to 29, and there are more than 2.2 million subreddits.

### **3. Community Categorization:**

We find that the term that categorizes Reddit's community the best is "open collaboration". According to Forte, A., & Lampe, C. (2013), open collaboration is defined as "...an online environment that supports the collective production of an artifact through a technologically mediated collaboration platform that presents a low barrier to entry and exit, and supports the emergence of persistent but malleable social structures".

We will break down the definition and show why it correlates well with Reddit's community:

- **"...an online environment..."** – Reddit's community is mainly active online.
- **"....that supports the collective production of an artifact..."** – each subreddit supports and encourages (by feedback/ranking) the production of different artifacts, whether its movie reviews, memes, art, music, or more.
- **"...through a technologically mediated collaboration platform..."** – Reddit's online platform is the "technological mediator" for its online community to collaborate on.
- **"...that presents a low barrier to entry and exit"** – the site is open for everyone to view and requires only an email & username to setup an account to comment or submit posts, making the entrance barrier "low". The exit barrier is also "low" – users can delete their account with a click of a button.
- **"...., and supports the emergence of persistent but malleable social structures."** – the "social structures" of Reddit are its many different subreddits, which anyone can create. They are "malleable" because they are led by the "spirit" of the community. In other words, the community itself decides its own direction and the relevant artifacts they share/discuss.

Forte, A., & Lampe, C. (2013), add that "combined, these characteristics yield complex socio-technical systems that offer new opportunities for people to form ties with others and create things together." The "complex socio-technical systems" – the subreddits – indeed offer new opportunities for people to meet and "create things together".

## **4. Key issues**

After analyzing the issues and facets of the community, we have chosen to focus on moderation within Reddit. Specifically, the level of involvement of moderators within their communities. The subject of moderation in peer-production communities has been studied extensively in the literature, including moderation in Reddit. The motivation behind those studies was to get a deeper understanding of the complexities of online governance, primarily by utilizing qualitative methods such as questionnaires or interviews.

We decided to take a different approach and employ quantitative methods by querying three different subreddits: r/politics, r/games/, r/AskDocs. By relying on raw data, we hope to shed new light on the inner workings of moderators – do they act solely as a policy enforcer by banning/warning users, or do they actually engage in conversations and express their opinions in discussions. We also aim to reveal where the focus of the moderators is – do they only act within their communities, or do they show participation in other communities as well, and if so, are those communities bear any similarities to the subreddit they are responsible for.

## **5. Secondary issues**

### **5.1 IT affordances**

As a social media, Reddit offers many of the affordances we studied.

Here we provide a quick and short recap in our own words to two key additional affordances we found in Prakasam, N., & Huxtable-Thomas, L. (2020).

Affordances:

- Affordance of **Credibility** - Reddit provides a "Karma" rating system that reflects the activity of the anonymous user. This rating is more of a "status symbol" for the user and does not carry any practical usage. Prakasam, N., & Huxtable-Thomas, L. (2020) denotes that a high karma rating may "add to the perceived legitimacy of the message and infers to readers that they are reading a majority viewpoint". This, of course, is not always the case. In general, high karma does not translate to credibility. As mentioned above, Reddit requires a simple registration process with no verifications. This allows people who were banned before due to guidelines violation to create a new fake persona (and sometimes even impersonating other people) with ease and return to the discussions without any obligations to credibility.
- Affordance of **Membership & Belonging** - Reddit is comprised of many subreddits, each subreddit is dedicated to a particular topic that people write about. Subreddits vary largely in community size, from several hundred to millions of users. Each subreddit has its own culture: unique memes, language, slang, humor, and even a distinctive look to its webpage (colors, theme, icons). This creates a sense of belonging and membership and adds a layer of familiarity and familyhood, especially between veteran members.

Additional affordances that can enhance Reddit:

- Affordance of **Democratic Moderation** - Each subreddit has its own moderators ("mods"). Moderators are responsible for maintaining their subreddit, for example, they can ban users, mute them, filter spam, and remove discussion threads. We suggest a democratic moderation, which will allow the community, via the voting system, to decide collectively if a user should be banned, or if a specific thread violates the rules of the subreddit. This contrasts the current system in which these abilities are centralized to a handful of moderators per subreddit.
- Affordance of **Complete Anonymity** - Reddit is not completely anonymous, since it requires a registration process with an email. Also, Reddit tracks the history of the viewed posts, comments, votes, and additional data per user. Moreover, certain subreddits are private and require the user to contact the moderators before joining in. This procedure may further reveal personal information. Therefore, we suggest that Reddit can be enhanced by allowing anonymous subreddits where users can participate without an account, and without the fear of their details and history being collected by the website.

## 5.2 Expertise, the "Wisdom of the Crowd" and Collective Intelligence

Everyone can join Reddit for free and contribute to the community. Reddit is composed of subreddits (sub-forums) where anyone can start a discussion, comment, and post whatever their heart desires, providing that community guidelines are met.

Reddit's collective intelligence is expressed in its ability to use the masses for answering burning issues and questions posted by the community. This ability is demonstrated mainly in two ways:

- Discussions among the arguing participants: Reddit encourages insightful debates, where each party uses their own "intelligence" to state an opinion on the subject in hand, and sometimes even improve upon each other's argument, hopefully reaching a consensus.
- The per-comment voting system allows the crowd to downvote or upvote each comment. The most "accepted" comment (i.e., answer) is usually the one with the most upvotes. Equally upvoted & downvoted comments are considered by the collective as "controversial", and largely downvoted comments are regarded as off-topic, inaccurate, fake, or offensive.

In these two ways, the Reddit community agrees on "The Average", the most accurate answer according to the "wisdom of the crowd".

No expertise is required to join Reddit and use its services. Albeit some subreddits, do allow users to be **verified** as a professional in a specific field. The verification is not "required for participation" but is highly encouraged and contributes to the credibility of the user and his posts/comments.

For example, "r/AskDocs", is a subreddit where Redditors (i.e., Reddit users) can ask the community medical questions. One of the rules of this subreddit allows Redditors who are real-life doctors to be verified as one, by sending the moderators "a link to a picture of a medical ID, diploma, or other credentials." (Reddit, r/AskDocs-Rules). Therefore, when a user who has a medical condition raises a question, other Redditors who are verified as doctors can answer the question, in addition to non-physician members of the community who can participate in the discussion as well.

This is a great example of "wisdom of the crowd" where experts and non-experts are gathered within a platform that motivates a large-scale discussion combined with a rating system that helps to weed out unhelpful "outliers" and irrelevant claims as judged by the collective itself.

In addition to the verification processes customary to specific subreddits as described above, Reddit users who are interested in becoming **moderators** are sometimes required to prove certain skills. Moderation of subreddits, especially the popular ones, is a role that a user may ask for, or be invited to by other moderators. The process of becoming a moderator is unique to each subreddit and may require experience in managing online communities and even a diploma, like the "r/science" subreddit which requires at least a bachelor's degree in science! (Mentalfloss, 6 Secrets of being a Reddit Moderator).

Verified professionals as in the case of the r/AskDoc subreddit mentioned above, are granted with a specific "flair" – a colored tag that appears by their username in every comment they make. The "flairs" contain a colored background and a description, for example, "Physician", or "Moderator". For verified Redditors, this feature does not grant any special privileges, other than being more perceived as a credible source than non-verified users.

On the other hand, moderators hold a vast majority of capabilities that are not available to the rest of the community:

- They set up the community, deciding things like its subject, description, and whether it should be considered over 18.
- They add the custom logo and styling.
- They can mark their posts or comments as those written by an official moderator.
- They can remove posts and comments from their community if they find them objectionable or off-topic.
- They can ban a spammer or other abusive user from posting or commenting in their community (This does not affect the user elsewhere on Reddit).
- They can add other users as moderators.

Moderators have no special powers outside of the community they moderate and are not employees nor are they appointed by Reddit. Moderators are expected to enforce site rules and abide by moderator guidelines. (Reddit, Help-Moderators)

As for extra privileges, we think that moderators already hold all the privileges they need to control the subreddit they moderate. More privileges can disrupt the open nature of Reddit and interfere with user-experience.

Some even claim that the moderators hold too many privileges, and therefore have proposed a concept of democratic moderation where the community itself will become self-managed with the help of a voting system. In this way, the privileges are essentially decentralized among peers.

### 5.3 Motivation for participation

Reddit is comprised of two groups: users and moderators. To be clear, moderators are users (i.e., Redditors) themselves, except for the fact that they hold extra privileges that allow them to manage the sub-forum (i.e. subreddit) they are responsible for.



#### Motivations for participation by **Users**:

- **Social Sharing** - Kameda, Tatsuya, et al (2002) state that sharing information beyond the direct kin group members is one of the core features characterizing human societies. Sharing allows humans to bring valuable and entertaining content to others. This serves as a gateway for social interaction and increases the sense of belonging & contribution. The Reddit community values people who share helpful, funny, interesting insights about different subjects (evident by the high rating of such posts/comments).
- **Social Pressure** – if the close environment (family, friends) of a person actively uses Reddit, the chances of the individual to use Reddit rise as well. This phenomenon can be a strong motivator and is quite common among peer-production environments with social aspects (Facebook, Twitter, etc.).
- **Spreading Agendas** - Reddit serves as an open platform where users can lay out any agenda they see fit, whether it is feminism, veganism, capitalism, etc. As a conversation platform, counter ideals are usually posted as well. This sometimes leads to heated debates and therefore motivates users to participate in discussions and prove that their point of view is the correct one.
- **Gaining Trust** – According to a survey by Bogers, T., & Wernersen, R. (2014), Trust could be a powerful motivator for active participation in Reddit. Specifically, subreddits in the form of r/news (worldwide news) and r/AskDocs where users are motivated to contribute facts & high-quality information to gain trust which allows them to be taken seriously as a reliable source.
- **Information Consumption** – The consumption of information in the form of news articles and the responses to them is likely to be a strong incentive for people to participate. Comments play a big role in Reddit; they serve as the main platform for discussion. People are curious to read comments and see whether they validate their own opinion or contradict it.
- **The User Experience** - Bogers, T., & Wernersen, R. (2014) suggest that the characteristics of the website itself, meaning the user experience offered by Reddit has a strong influence on whether people continue to use it or not. The simplicity of Reddit, the Endless-Scroll feature, the user interface (aesthetics), are among the several features which drawback users. The site is simply fun to use.

#### Motivations for participation by **moderators**:

- **Challenge** – Reddit moderators volunteer to perform several "duties" within a particular community: removing offensive posts, banning users due to inappropriate conduct, visually styling the subreddit page, and much more. When dealing with communities as big as 7 million users, r/politics subreddit, for example, moderation definitely could be perceived as a challenge. r/politics is regulated by 70 admins, each with their own privileges and unique tasks. People are known to be motivated by challenges and moderating a subreddit might fulfill this desire.
- **Skills & Qualities** – Good moderators are those who possess empathy, a deep understanding of the subreddit, leadership, teamwork, honesty, and vision. Moderators sometimes find themselves

arguing with users & trying to reason their actions towards the community. These skills and qualities can be sharpened by long-term moderation and serve as a good motivator.

- **Caring** – Moderators can be motivated by the simple care and love for the community they are responsible for. Hence, moderators are motivated to ensure that the subreddit remains a fun, interesting, and well-organized place for discussion and sharing.
- **Reputation & Respect** – moderators are perceived as knowledgeable members of the community and they are usually respected by others. Since people seek a good reputation and the sense of being respected, it is quite understandable why someone would be motivated to become a moderator.

## 5.4 Quality Assurance

There are many platforms similar to Reddit in style, who also serve as a platform for online discussions and content sharing, for example:

- **Quora** – is an American question-and-answer website where questions are asked, answered, followed, and edited by Internet users, either factually or in the form of opinions (Quora, Wikipedia).
- **9Gag** - is a Hong Kong-based online platform and social media website, which allows its users to upload and share "user-generated content" or other content from external social media websites (9GAG, Wikipedia). The platform is dedicated mainly to Internet memes and allows discussions in the form of comments, like Reddit.
- **Digg** - is an American news aggregator with a curated front page, aiming to select stories specifically for the Internet audience such as science, trending political issues, and viral Internet issues (Digg, Wikipedia).

There are many similarities between Reddit and the platforms mentioned above:

- The content featured on Reddit is promoted to higher visibility by a greater number of users "upvotes." If a submission receives "downvotes," this will hinder its rating and therefore visibility. Digg posts are promoted based on a combination of Facebook shares, Twitter tweets, and "Diggs" ("likes") that a story receives. (what is the difference between Digg & Reddit, Chron).
- In 9Gag, a user can get a verified badge that appears next to the account's username in the comments. It signals that the account belongs to an authentic account of public interest.
- Like Reddit, Quora shows how many answers you have written, how many views you got, and upvotes for each of your submissions.
- All the platforms contain moderators who enforce the policies of the community.

In terms of quality, we find it hard to definitively compare the product Reddit produces to the product of its competitors. This is mainly because there is not a specific metric that measures the quality of products made by a community. For example, if we try to compare two different art forums that share artwork, it is difficult to quantify the level of quality each community produces and compare them with each other. That being said, Reddit is the most popular of all its competitors. One might say that this is a sign of a good-quality website. In our view, this assumption bears some truth, although smaller competitors might produce content of the same quality or even better.

With regards to "commercial" competitors, we found that the financial model of Reddit and its rivals are similar – they all receive revenue primarily from advertisements and promotions.

Continuing with the points we mentioned above, we will now concentrate on Reddit's quality control mechanisms and processes:

- **The Karma System** - serves as a key sign of quality: "...Karma is a contested quality-indicator. Karma-points might suggest a high value by representing a large amount of upvotes" (Richterich, A., 2014). Every registered user can upvote or downvote content. A user with a high karma rank will be recognized by Reddit's algorithm, which will make sure the user will get more exposure. In effect, this means that the distributed content is of higher quality while mitigating the distribution of "lower quality" content. (What is Reddit Karma and Reddit Gold? by Gajanand Makwana Sep 4, 2019).
- **Auto Moderators** - are one of the automated methods to maintain content quality in Reddit. This solution uses a bot-based filtering approach where moderators encode phrases that typically appear in unwanted posts as bad phrases. The bot then scans any submitted content to detect the presence of these unwanted phrases and removes them (Jhaver, S., Birman, I., Gilbert, E., & Bruckman, A., 2019).
- **Verified Experts** - for example in the "AskDocs" subreddit, questions can be asked by users, and answered by a verified expert in each field (a physician in this case).

In our opinion, the methods, and mechanisms that Reddit is using now provide good results, as evident by the popularity of Reddit. And yet, some improvements could be made to enhance these QA processes:

- **The karma system** - the system might be biased towards new creators. A situation may occur, where new users contribute quality-content but get less exposure because of their low ranking. A compensation mechanism can be implemented to ensure that new users will not be discriminated against because of low Karma.
- **Subreddit bot suggestion**- sometimes the user does not know in which community he should post content or ask a question. We would like to offer a mechanism operated by a bot that will allow users to "chat" with it, describe the content they want to share, receive a suggestion of an appropriate subreddit that fits their needs.

## 5.5 Coordination and Conflict Management

Reddit is a website comprised of many sub-forums where people share information.

As such, the **key coordination** mechanism of the community is the discussions between peers done in Reddit itself and outside of it by external communications. The context of the conversations and the "work" goals depend on the participating users.

We will note that the topic of work-coordination within Reddit is somewhat undocumented in the literature, therefore the following serves as our own view of the subject as long-time Reddit users.

To answer "how is work coordinated" in Reddit, we must first define the roles and hierarchy within the community. Only then we can define the "work" being done and relate to the three concepts (task assignments, responsibilities, and communication) per each role:

### 1. Redditor (Member):

- **Description** - "average user" who signs and joins the website.
- **Work** - Sharing web content among the community, discussing different topics with other peers, and rating posts/comments.
- **Task Assignment** – None. Redditors are completely autonomous. They can use the site as a complete "bystander" or as a top contributor.
- **Responsibilities** – Meet Reddit's content policy and the rules of the subreddit they participate in.
- **Communication** – Communication is done mainly through the subreddit itself, i.e., posts/comments. Some Redditors can directly PM (personal message) to each other or use the chat of the subreddit.

\* All following roles are considered "Redditors"; They all inherit the features of a regular "Redditor", but differ in some respects, as explained in each role.

### 2. Verified Members:

- **Description** - users with an honorable mention which appears beside their username and visible to all. For example, the "verified physician" tag, as seen in the "AskDocs" subreddit for users who were verified by moderators as medical doctors.
- **Work, Task Assignment, Communication** – Same as a regular Redditor.
- **Responsibility** - verified members hold additional responsibilities – the posts and comments of a verified user are perceived as more credible; therefore, they are expected to act more responsibly by moderators when discussing with others.

### 3. Partial Moderator:

- **Description** - Moderators who hold partial privileges for the subreddit.
- **Work** - They oversee specific parts of the forum, for example: the chat, answering user emails, verifying users, or styling the subreddit.
- **Task Assignment** - The tasks and the permissions they receive are directly given to them by "full moderators".

- **Responsibility** – Ensuring the correct function of the feature they are responsible for and serve as an example to the community by respecting others and keeping posts/comments fun, informative, and engaging.
- **Communication** – same as a regular Redditor, although the communication with "full moderators" is more personal and may extend beyond Reddit's scope via web video or voice conferencing software. Moderator teams can also create backroom subreddits for private discussions.

#### 4. Full Moderator:

- **Description:** Moderators who hold full permissions for all the features of the subreddit.
- **Work:** Overall management of the subreddit, including accepting other moderators, ensuring community guidelines, removing irrelevant posts, organizing events, banning users, and managing conflicts.
- **Task Assignment** – mainly assigning permissions to other partial moderators and assigning tasks when organizing special events. For example, the subreddit "AmA" (Ask me anything) frequently hosts famous people (actors, scientists, etc.) who answer the comments of other Redditors. These types of events require coordinated work by moderators to setup.
- **Responsibility, Communication** – Same as average Redditor and a "partial moderator", but in a larger scope: Full moderators are responsible for more aspects of the subreddit therefore they are more engaged with the community, and "partial moderators".

#### 5. Administrators:

- **Description:** These are essentially the employees of the Reddit company who are also a part of the community itself.
- **Work:** Hold global in charge of the website, managing the technical and administrative aspects of the site.
- **Task Assignment, Responsibility, Communication** – These three components are less known to the public since they refer to internal procedures of the Reddit company. Although administrators do engage in forum conversations and are responsible for the correct functioning of the site, their exact ways of internal communication and intricate responsibilities are naturally not available to the public.

## 5.6 Conflicts, Norms, Identities, Communities

As the 17<sup>th</sup>-most-visited website in the world (October 2020), having approximately 330 million users, Reddit is no stranger to conflicts within its communities. Combining anonymity, controversial topics, freedom of speech, and a vast number of participants, one might easily think that Reddit is a Petri dish for conflicts, growing uncontrollably thanks to seemingly absent governance and lack of norms. Is that so? We will review the subject by answering the following questions:

According to Aswath, S., Godavarthi, D., & Das, B. (2020), there are two types of conflicts within Reddit:

1. **Conflicts between Individuals** – these can be further divided into user-user and user-moderator conflicts:

- **User-User Conflicts** – Apart from heated debates on different topics that express a strong level of disagreement and conflicting opinions, users can also penalize others by down-voting their posts/comments or by reporting them to the moderators for violating norms. These actions are not always acceptable by the opposing party, which naturally leads to disputes between members. Moreover, some users simply "troll" others (upset on purpose) just for the sake of igniting a conflict.
- **User-Moderator Conflicts** – Moderators can ban users, remove their posts or comments, and publicly warn them not to violate community guidelines. Needless to say, not everybody agrees with certain acts of moderation. To overturn their verdicts, "punished" users must engage with moderators in the hopes of reaching common ground, and obviously when user-moderator interests collide - conflicts arise.

2. **Inter-Community Conflicts** – occur between multiple communities (subreddits). For example, every football team has its own subreddit like "reddevils" for Manchester United. During football matches, conflicts take place between the participating subreddit teams.

The subreddit that initiates a conflict is referred to as an "attacker" subreddit and the subreddit that gets affected is called the "defender" subreddit. When the conflicts are overwhelming in their numbers and intensity, either the attacking users are blocked from the Reddit platform or the entire subreddit can get banned because of a majority of users who transgress Reddit's norms.

Conflicts in Reddit indeed have detrimental consequences: bans, content removal, threats, degrading language, waste of time and effort by moderators, etc. In the long run, this may cause deterioration to the overall quality of the affected subreddit.

Kumar, Srijan, et al. (2018) have found that inter-community conflicts in Reddit have long-term adverse effects on the engagement of members of the targeted community, although these effects "can be mitigated by direct debates with the attackers".

Having said that, healthy conflicts are vital for creating a vibrant community, and a better peer-production environment. Healthy conflicts are constructive conflicts – the kind that stirs disagreement but does not encroach upon people's basic respect for one another. These can be found in heated debates, especially in controversial subreddits like "politics".

Another example of "beneficial conflicts" is evident in cases where the quality of posts in a subreddit seems to degenerate over time in terms of content and quality of discussion. In these cases, veteran users usually do not hesitate to confront the author of the low-quality post, requesting them to take it down or improve it. These confrontations are generally constructive and done out of a sense of care towards the community, aiming to maintain good community standards and user-experience.

As stated by Chandrasekharan, Eshwar, et al. (2018), norms are central to how online communities are governed. In that regard, Reddit is no exception. Norms play an important role in guiding acceptable behaviors and regulating moderation in Reddit. The study has performed an analysis on comments from the website from within a 10-month period. They Identified 8 macro, 21 meso, and 15 micro norms:

- **Macro norms** are widely enforced by the moderators on most subreddits. For example, using misogynistic slurs is considered a norm violation. Hate speeches in the form of homophobic and racist slurs are also considered as norm violations on most parts of Reddit.

- **Meso norms** are widespread in specific subreddits. For instance, some subreddits highly discourage comments that only express thanks, since they do not add any layer of informative depth to the discussion. Attempts to be sarcastic or funny may also be conceived as inappropriate in certain subreddits such as "AskDocs", which deals with serious medical questions.
- **Micro norms** are context-dependent, and highly specific to individual subreddits, and are not found to be widely enforced on most parts of Reddit. For instance, in the science subreddit, "AskScience" moderators do not tolerate diet advice, especially pro-anorexic content in discussions.

Also, we observe that there is an interesting reciprocal relationship between rules and norms in Reddit. Community rules are initially set up by moderators and are meant to enforce norms. The rules themselves are then shaped by emergent norms that arise from interactions between members over a long period. In other words, the rules, and norms of a subreddit are closely related, they affect each other and evolve together.

To become successful, a subreddit must host a safe and enjoyable environment for peers to collaborate. When humans are beings left free to act according to their own will, we often witness the production of spontaneous order and norms. These norms help in governing the collaboration processes by setting up a certain bar of quality, language, and respect between peers.

As previously stated, norms form rules and vice versa, and rules are the primary tool in the toolbox of moderators who use them to instate order and cooperation. Throughout Reddit, one can notice comments of moderators explaining to users that they violated a specific rule or norm, therefore they must refrain from that behavior again, or risk being sanctioned.

The same norms and rules specifically help in managing conflicts, by offering the community a set of "do's & don'ts" along with a description of the consequences of not abiding by them, as seen in the FAQ (Frequently Asked Questions) section of most subreddits.

An interesting example of collaboration between Redditors was studied by Rappaz, Jérémie, et al.(2018) who looked at the "Place" subreddit. "Place" hosted a 72-hour collaborative project in 2017, where over 1 million users could place a single-colored pixel in 5–20-minute intervals on an online canvas. Although the early hours of the experiment were characterized by chaotic attempts at image creation, the final artwork contained, among others, recreations of the "Mona Lisa" by Da Vinci and "The Starry Night" by Van Gogh, despite having the ability to sabotage each other work.

The online newspaper "The A.V. Club" called it "a benign, colorful way for Redditors to do what they do best: argue among each other about the things that they love". The website Gizmodo labeled it as a "testament to the internet's ability to collaborate". The subreddit only had two main rules: 1. Be Creative 2. Be Civil. We assume that these two simple rules provided a framework for norms to be established, which in turn effectively governed the collaboration process without any moderation or guidance.

Continuing the previous points, Identity is also constructed in relation to rules and norms in a social setting. Real-world Identity is a multi-faceted construct in that people can have several identities. This

principle also extends to online communities, like Reddit where users are anonymous by default, allowing them to switch identities with ease - Anyone can be anyone they want on Reddit.

According to Dosono, B., & Semaan, B. (2019) Reddit can also be used as a means of making sense of or changing one's identity, also known as "Identity Work". The study states that Reddit constitutes "identity work spheres" - public spheres that provide a space for "the enactment of collective identity work", established by creating anonymous profiles that are detached from real-world identities.

Reddit is open for all to view but requires registration via pseudonym for active participation (commenting, posting, etc.).

Apart from the inherent anonymity granted for registered users, members can also be identifiable by other means as well:

- **Verified Member** – these are members of a subreddit who contacted the moderators claiming to be a specific person, usually providing physical proof. For example, moderators of the subreddit "AMA" (ask me anything) ask those who want to be verified to "be prepared to send tangible documentation sufficient to meet an unequivocal proof standard" (AMA, FAQ). Verified members are identified by a "Verified!" tag which appears along-side their name.
- **Profession Verification** - Verified professionals as in the case of the "AskDocs" subreddit, are granted with a specific "flair" – a colored tag that appears by their username. The "flairs" contain a colored background and a description, for example, "Physician", or "Moderator".

It is important to note that a combination of identities is also allowed: For example, a member can be anonymous by name and recognized as a doctor (profession verified).

Although the anonymity of Reddit holds positive aspects such as an increased sense of social safety and freedom of speech, anonymity also bears a negative side – trust issues. Aside from verified members, and verified professionals, people usually do not know the identity of the person they interact with. Naturally, this raises doubts about the intention and information provided by the individual.

In practice though, thanks to the sheer number of users and the "wisdom of the crowd" principle, harmful or false content is almost immediately verified by the community through mass fact-checking and users' previous knowledge. In other words, large-scale discussions which are an integral part of Reddit are viewed as more trustworthy than anonymous one-on-one interactions, where trust is often low.

Regarding user-moderator trust, we observe that it exists de facto, because without it a subreddit would probably experience long-term deterioration of quality and difficulty surviving. If members would not trust moderators, adhere to the rules and quality and standards set by them, then how can a complex and diverse community stay successful? In our view, user-moderator trust is a pillar of a good-quality subreddit.

In addition, Squirrell, T. (2019) has identified the FAQ section as a means of creating trust between moderators and users. In FAQ's, moderators "can prominently and authoritatively set out their vision" and post reliable resources for additional information, In addition to subreddit-specific trust-building norms.



McMillan & Chavis (1986) define a sense of community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to being together." Despite being difficult to objectively quantify, we notice that a sense of community does indeed exist on Reddit. Many subreddits host their own events (including real-world gatherings), and more than often a unique slang, memes, and internal jokes can be found within certain subreddits.

For example, tv-shows subreddits host popular discussions pre, during, and post episodes where people gather to predict the story together, chat during the episode itself, and try to figure out future plots.

Another manifestation of a sense of community is seen through Reddit's voting, trophies, and award system, all can be used to express appreciation and gratitude between peers:

- **Voting** is the primary tool for showing appreciation within a community. Good quality content is typically promoted by peers, making it "hot" - increasing its popularity and exposure to others.
- **Awards** (silver, gold, platinum) can be acquired by a certain amount of Reddit coins. These coins can be given by one user to another for recognizing the high-quality content they have posted. Once the Awards are "bought" by coins, they grant a specific benefit, for instance, ad-free browsing or access to the "lounge" subreddit which is made up of top commenters.
- **Trophies** are given to commemorate a specific action of a user, for example, the "Combo Linker" trophy is given to those who submitted a lot of good links.

## 5.7 Managing Intellectual Property

Intellectual Property (IP) in Reddit is mainly divided into two parts – the operating website as a framework for user activity, and user-generated content (UGC) also known as "The community product":

1. **The Operating Website (Framework)** - every aspect of content manufactured by Reddit, including reddit.com, from design to software is an IP of the Reddit company, and is protected by laws of copyright. Employees of the company are the only ones authorized to modify elements in this category.
2. **User-Generated Content (UGC)** – These include all content submitted by users.

According to the "content" section of the user agreement, "a user retains the rights to his submitted copyrighted content or information". This means that although the content is posted publicly and uploaded into the servers of a foreign platform, the original poster remains the legal owner of the uploaded material. The agreement continues and adds that by submitting content, the user grants Reddit an "exclusive, irrevocable, worldwide license to reproduce, distribute and publicly display the uploaded materials for any purpose, including commercial purpose."

This statement is rather difficult to interpret in terms of legal consequences. We infer that despite the fact the user keeps possession of the copyrighted material, UGC does become the property of Reddit, albeit with limitations - they cannot modify the content without permission from the original owner.

Reddit is only allowed to display UGC without the owner's permission for any purpose they see fit. In terms of modifications: the original submitter can edit and/or remove the content. Reddit staff and moderators can only remove or repost it.

As UGC is displayed on the Reddit platform, the company holds special responsibility for ensuring that content does not cause copyright infringement:

Every year Reddit publishes a "Transparency Report" in which it presents statistics regarding deleted content by staff and moderators, including copyright removals. According to the 2019 report, 124,257 copyright violating content was removed.

Also, the user agreement reveals a different angle regarding the full retention of copyrights by the user: "...because you alone are responsible for your content, you may expose yourself to liability if you post or share content without all necessary rights", or in other words, according to the "Peter Parker Principle": "with great power comes great responsibility".

## 5.8 Managing Intellectual Property Rights

Reddit was an open-source project from June 18, 2008, until 2017 (Reddit, Wikipedia). During that time, all the code and libraries written for Reddit were freely available on GitHub, except for the anti-spam/cheating portions. In September 2017, Reddit announced that the company effectively stopped updating their open-source repositories because "they were doing a bad job of keeping them up to date". (Reddit, Wikipedia).

In essence, Reddit violated **the moral economy** – According to Birkinbine, B. J. (2015) the moral economy of the open-source software (OSS) community is based on "shared ideals of peer-to-peer relationships, collaborative development, transparency, community, and productive autonomy". Reddit did the same by stopping peer-to-peer relationships and terminating collaboration. Therefore, development forks were performed by peers, and Reddit-like alternatives were created such as Cedit.com. History was repeated once again, similarly to the Sun Microsystems acquisition by Oracle, and the forking of MySQL by developers to continue its development independently elsewhere due to halted support.

But there is a larger issue in our view, which lies within Reddit itself, where other commercial interests collide with communal goals:

Reddit is a private business company, and as such, one of its main goals is to increase financial gains. The company generates revenue in part through advertisements and promotions visible on the website. Therefore, Reddit has a clear commercial interest in increasing its user base, and in turn, increasing revenue from ads.

This is where Reddit's business interests collide with the main communal goal of the platform: providing a platform for freedom of speech. Although each subreddit has its own topic and unique purpose (criticizing movies, sharing game deals, etc.), they all share a common goal: providing people a safe place for discussion, expression of opinion, and content sharing. All three of these elements are governed by Reddit's policies and community guidelines, designed to establish a safe place where freedom of speech can be established.

The problem becomes apparent where freedom of speech is being challenged by the community. Reddit cannot tarnish its reputation by becoming a platform that promotes Nazi propaganda or racist hate speech, simply because companies will not advertise on the site, which can damage revenues. Therefore, Reddit must actively pursue illegal content, and remove extreme opinions, or to put it another way – apply censorship. The issue is that freedom of speech, and the community guidelines set up by the company, are not binary - some discussions walk a thin line between being legitimate and extreme. Users who were banned, or their content was removed simply because they were too controversial, are not too content with these decisions, as expressed in the post "Reddit censorship is slowly killing the site" (r/unpopularopinions, subreddit).

As stated above, the current tension between Reddit's commercial and communal goals revolves around censorship of controversial material – on the one hand, Reddit wants the site to be less toxic and appropriate for advertisers, and on the other hand, this may collide with the ability to express radical opinions or content. We will now provide examples for this tension:

On January 08, 2021, Reddit banned the subreddit r/donaldtrump - one of the biggest pro-Trump subreddits on the platform — after “repeated” violations of the site’s policy against inciting violence (Todd Spangler, Variety). The subreddit had about 52,000 members before it was shut down. A notice on the page says, “This community was banned due to a violation of Reddit’s rules against inciting violence.” Also, on June 29, 2020, Reddit banned 2000 “Racist and Violent Forums Including The\_Donald”, most were inactive. (Todd Spangler, Variety).

According to Olivier Douliery (the conversation), “These shifts mirror changes in Reddit's overall governance approach”. Olivier states that the platform has sold itself as a democratic space for free speech, but now Reddit faces pressure from advertisers that do not want their brands associated with political extremism. He adds that much of Reddit's popularity has come from its status as the “wild west” of the internet, and that in trying to balance the tensions between free speech and regulation, Reddit finds itself stuck between a rock and a hard place.

## **6. Detailed analysis of primary issue:**

In this research, we aim to examine **the level of involvement of moderators within their communities**. Our research is focused on three subreddits, each with its unique features:

### **1. Politics:**

- **Description** - a subreddit for news and discussion about U.S. politics. It contains shared articles, videos, sound clips, and polls related to the U.S government, elections, candidates, etc.
- **Members** - 7.3 million members.
- **Number of moderators** – 59 moderators.

### **2. Games:**

- **Description:** The goal of r/Games is to provide a place for informative and interesting gaming content and discussions.
- **Members:** 2.8 million members.
- **Number of moderators:** 29 moderators.

### 3. AskDocs:

- **Description:** The goal of r/AskDocs is to offer a place for Redditors to ask verified physicians medical questions. The moderators of AskDocs are also physicians.
- **Members:** 282k members.
- **Number of moderators:** 13 moderators.

To measure the involvement of moderators within their communities, we have decided to define "involvement" as a two-part question:

- **Where moderators are active?** – Do moderators operate mainly within the subreddit they are responsible for? Or maybe they are commenting and posting content on other subreddits? And if so, are those subreddits bear any similarity to the subreddits they moderate? To answer this question, we will measure the distribution of comments and posts per moderator.
- **What moderators say?** – is their activity characterized as administrative, meaning they only enforce policies and rules, in other words, are they bystanders? Or maybe moderators do engage with the community, and actively participate in discussions? This will be measured by word frequency – We will analyze the most frequently used words by moderators in post titles and in their comments.

One may ask What is the significance of knowing the involvement level of moderators? Like many other studies, this research also aims to reveal new perspectives on moderation in Reddit by asking if:

- moderators are bystanders or active participants?
- the attention of moderators is focused only on their communities?

The existing literature has studied moderation in Reddit by qualitative means, mostly through interviews. For example:

- Jhaver, S., Bruckman, A., & Gilbert, E. (2019). Does transparency in moderation really matter? user behavior after content removal explanations on Reddit. *Proceedings of the ACM on Human-Computer Interaction*, 3(CSCW), 1-27.
- Birman, I. (2018). Moderation in different communities on Reddit--A qualitative analysis study.
- Grimmelmann, J. (2015). The virtues of moderation. *Yale JL & Tech.*, 17, 42.

Instead of utilizing qualitative methods, we aim to shed light on this subject through quantitative research, using raw data queried directly from Reddit. To query data from Reddit we will use PRAW – Python Reddit API Wrapper. For each subreddit (Politics, Games, AskDocs) – we will:

1. Collect 1000 of the newest posts and comments submitted per moderator.
2. Aggregate the following results from each moderator into a combined set of data:
  - Distribution of posts in Reddit
  - Distribution of comments in Reddit
  - Word frequency of post's titles
  - Word frequency inside comments
3. Analyze the results.

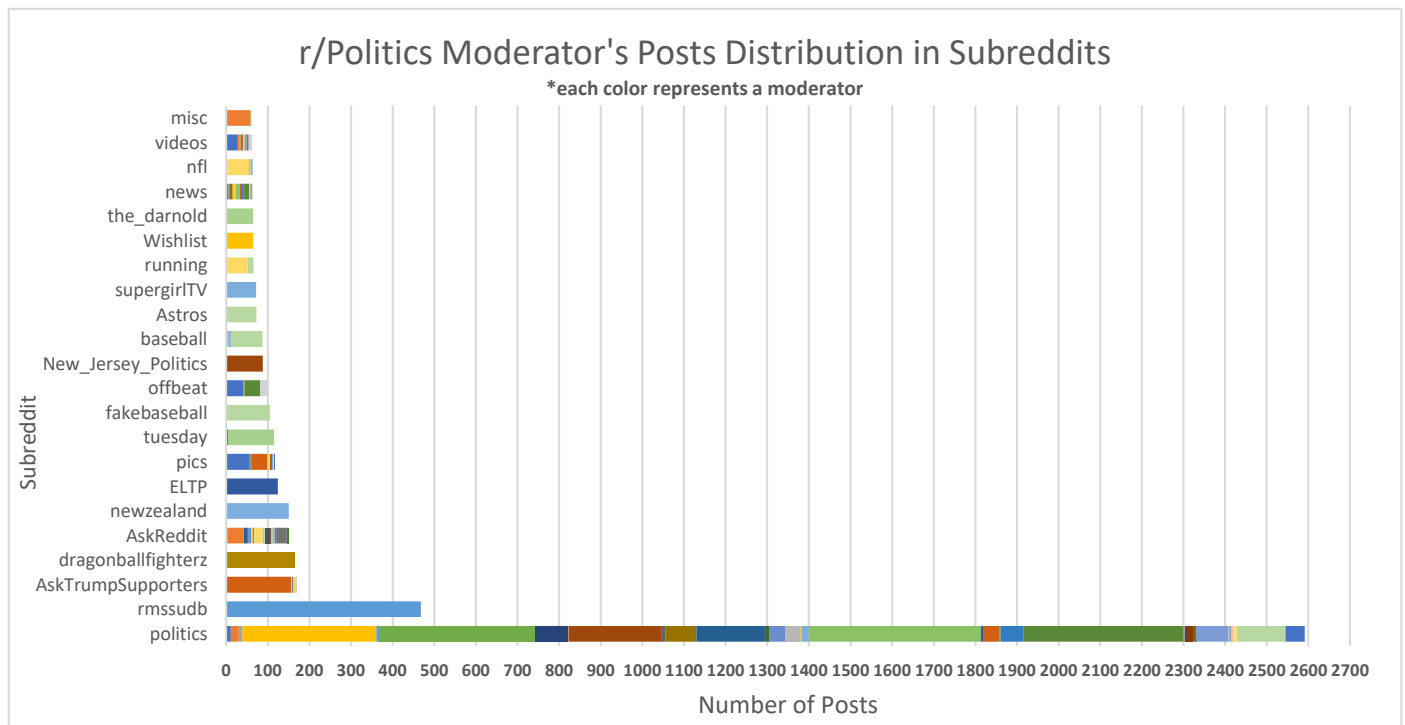
## Technical Notes:

- The process of counting word frequency included language processing techniques such as the removal of stop words ("to", "the", "and", etc.), ignoring 2-character words, decapitalization, and lemmatization ("votes" or "voters" are brought down to their root – "vote"). This was done to get a clear picture of the vocabulary each moderator uses, excluding similar or less meaningful words.
- The chosen subreddits contained bots that served as moderators. These bots were removed from the datasets because they skewed the results by adding repeated words and identical posts. Only human moderators were assessed.

In the following section we will examine the results per subreddit, starting with Politics:

### a. r/Politics Subreddit

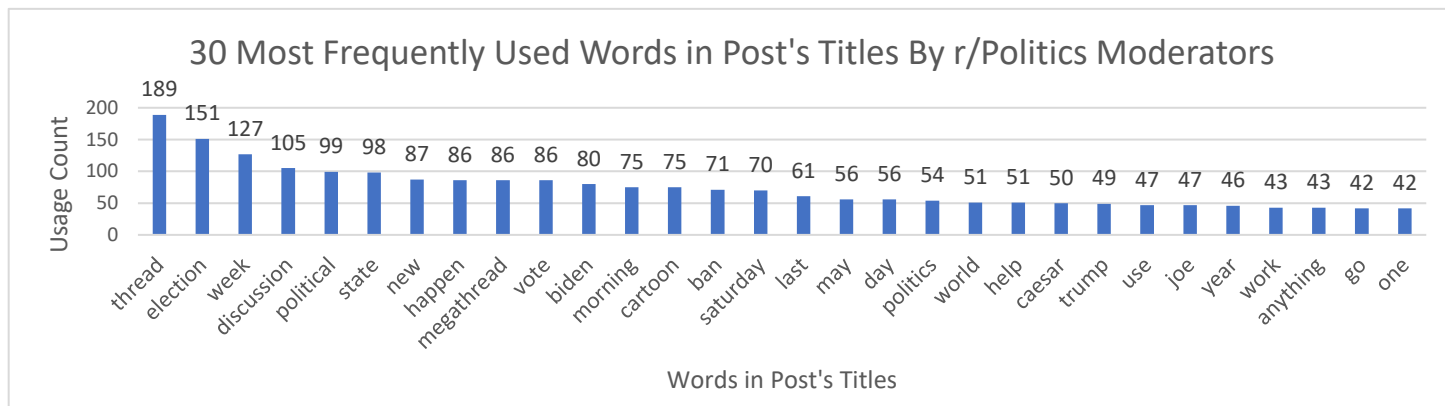
#### a.1 r/Politics - Posts distribution



#### Analysis:

- The vast majority of posts by r/Politics moderators are found in r/Politics itself (~2600 posts). This means that r/politics moderators are mostly active within their community.
- Posts can be found in similar subreddits such as r/askTrumpSupporters and r/news.

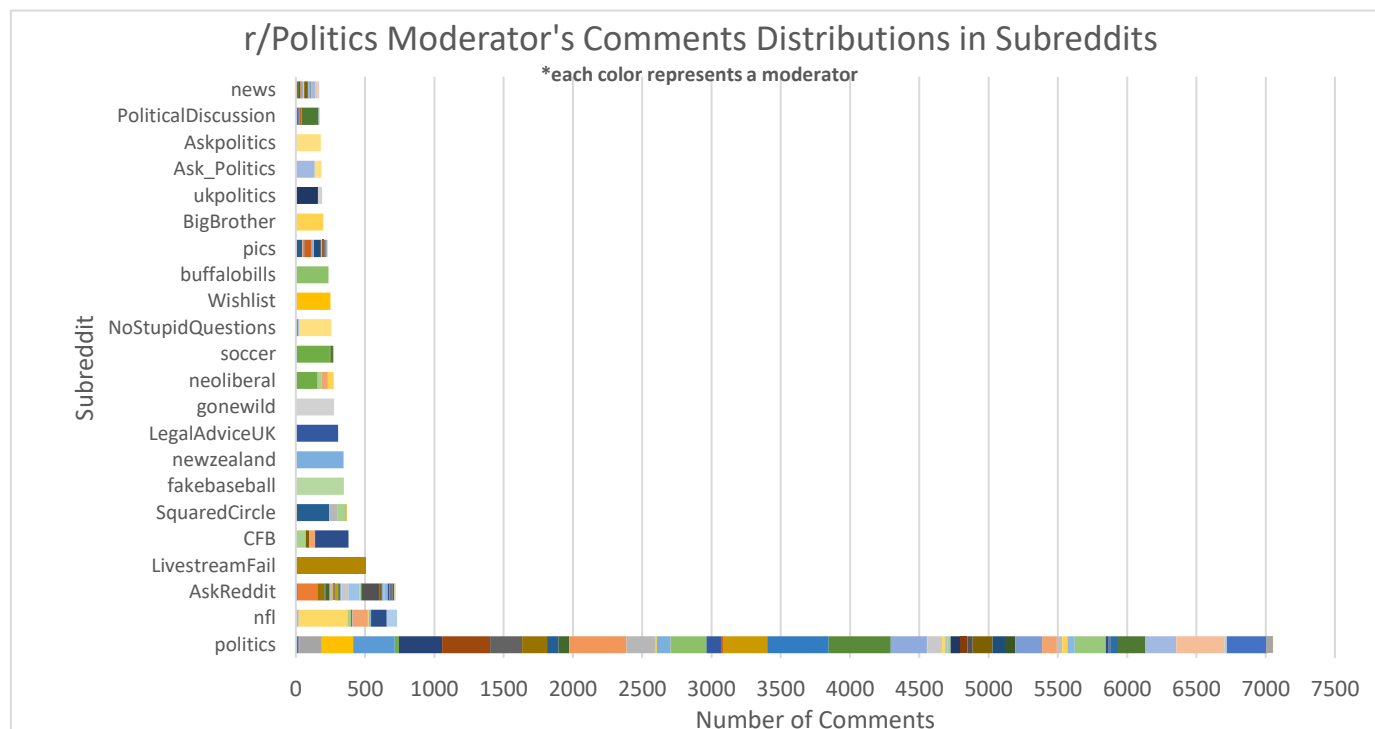
## a.2 r/Politics - Frequency of words in post's titles



### Analysis:

- It is visible that r/Politics moderators create posts that motivate the community to participate in political discussions as apparent by the use of the words: "biden", "trump", "elections" "megathread", "thread" and "discussion".
- moderators are less likely to express opinions in post titles, as evident by the lack of adjectives.
- The word "ban" appears 71 times in titles, showing that moderators publicly warn the community.

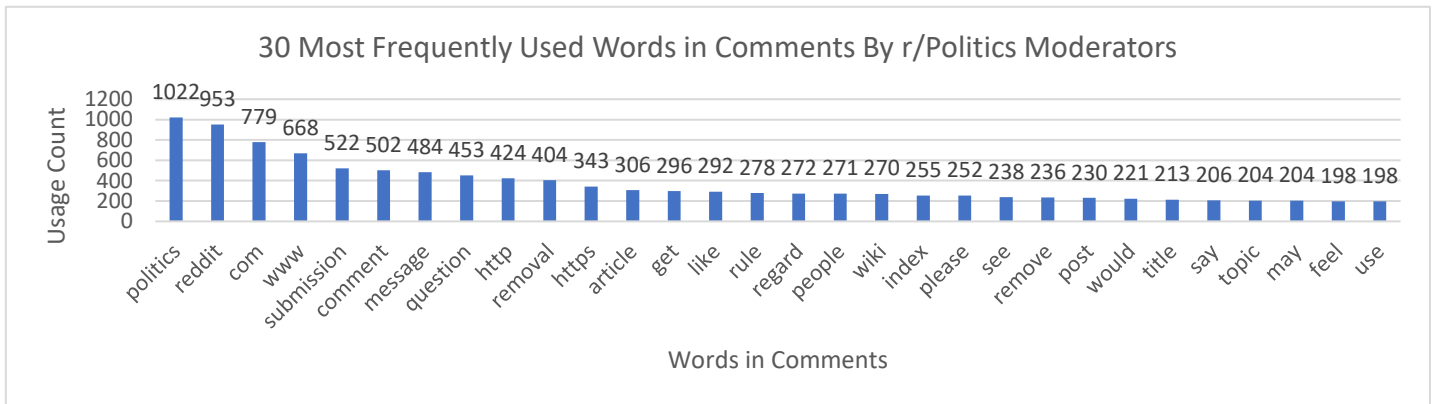
## a.3. r/Politics - Comments distribution



#### Analysis:

- r/politics moderators mostly comment and active in r/politics (~7000 comments).
- Moderators also comment in similar subreddits such as r/ukpolitics, r/PoliticalDiscussion.
- Moderators answer questions about moderation in r/AskReddit (~600 comments), as subreddit for general questions. For example, the r/Politics moderator "Jakeable" has commented the following answer for a question submitted in r/AskReddit by a user who asked about becoming a r/politics moderator: " You can still apply as long as you meet the requirements."

#### a.4. r/Politics – Frequency of words in comments

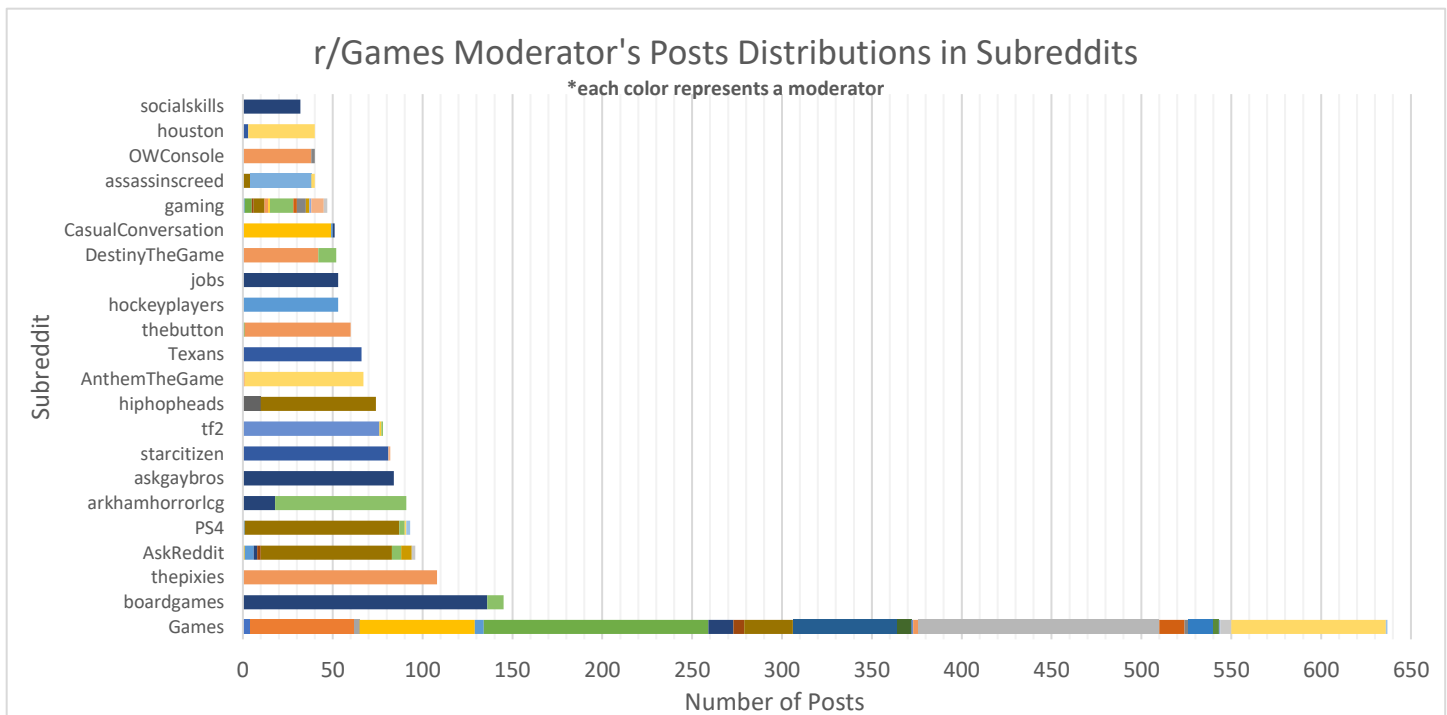


#### Analysis:

- The most common words "politics", "comment", "removal", etc. all stem from a template message moderators use to warn users, as demonstrated by the moderator "Qu1nlan" who commented: "Hi `muranetnet`. Thank you for participating in /r/Politics. However, [your submission](<https://old.reddit.com/r/politics/comments/jre8yq/-/>) has been removed for the following reason(s):.....". The repetition of this template shows that moderators mainly focus on enforcing policies, although by reviewing less frequent words (not appearing in the graph) we do see some level of active participation.

## b. r/Games Subreddit

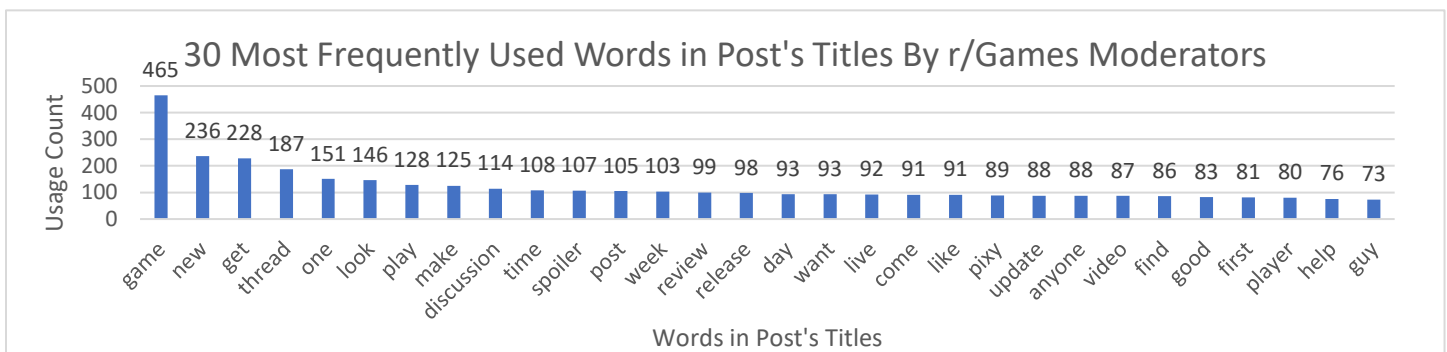
### b.1. r/Games – Posts Distribution



#### Analysis:

- The vast majority of posts by r/Games moderators are found in r/Games itself (~650 posts). This means that r/Games moderators are mostly active within their community.
- The Moderators also post in other subreddits similar in topic such as: r/tf2 (the video-game "team-fortress 2"), r/starcitizen (video-game), r/DestinyTheGame, r/PS4 (PlayStation 4) and so forth.

### b.1. r/Games – Frequency of words in post's titles

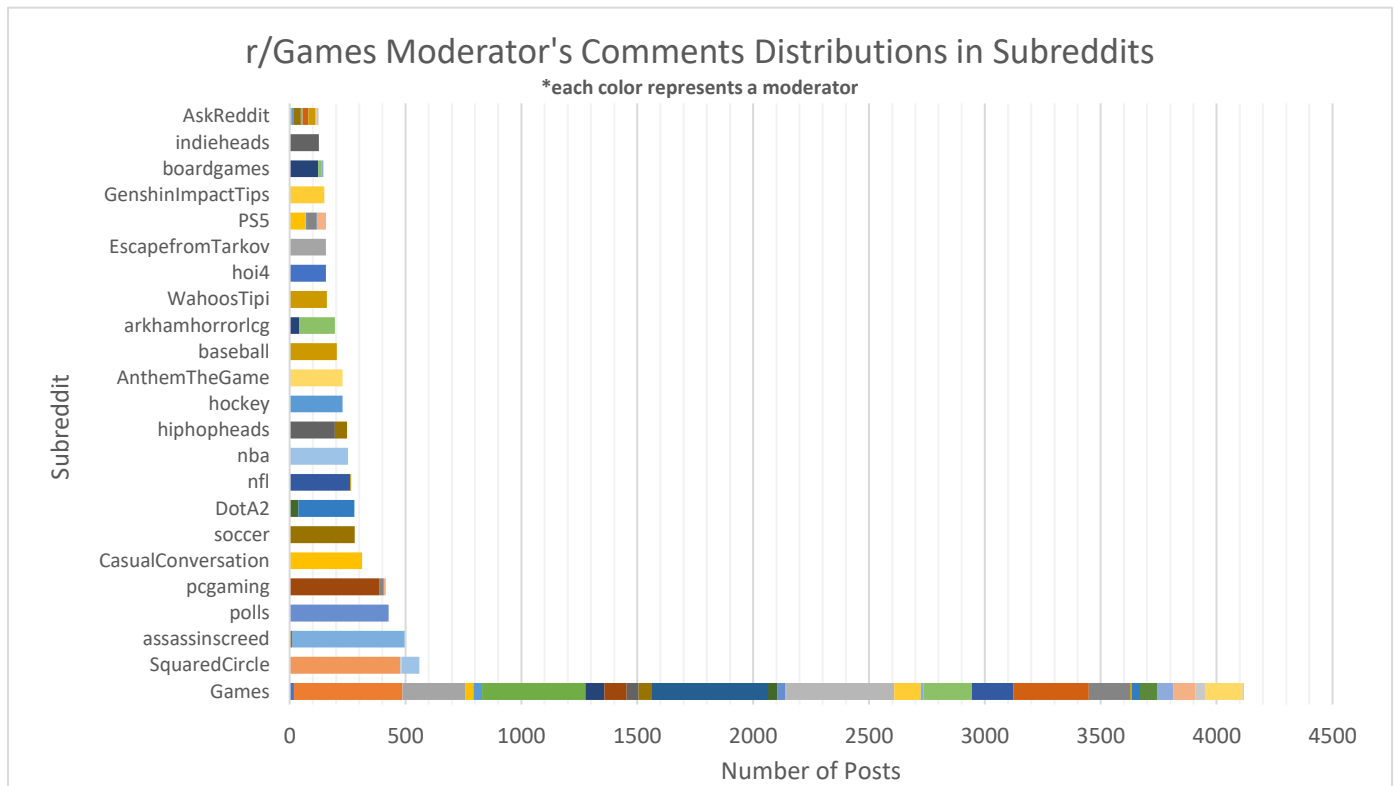


#### Analysis:

- As in r/politics, r/Games moderators create threads related to the subreddit's topic as apparent by the words: "game", "play", "discussion" and "thread".



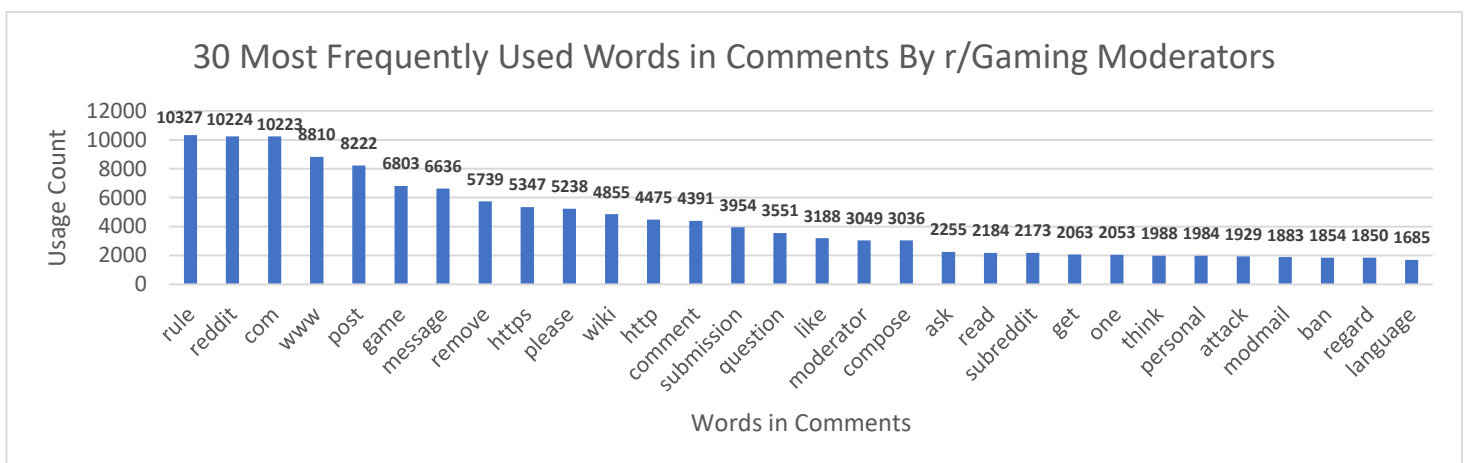
## b.2. r/Games – Comments distribution



Analysis:

- r/games moderators mostly comment and active in r/Games (~4000 comments).
- Moderators also comment in similar subreddits: r/pcgaming, r/ps5 (PlayStation 5), etc.

## b.3. r/Games – Frequency of words in comments

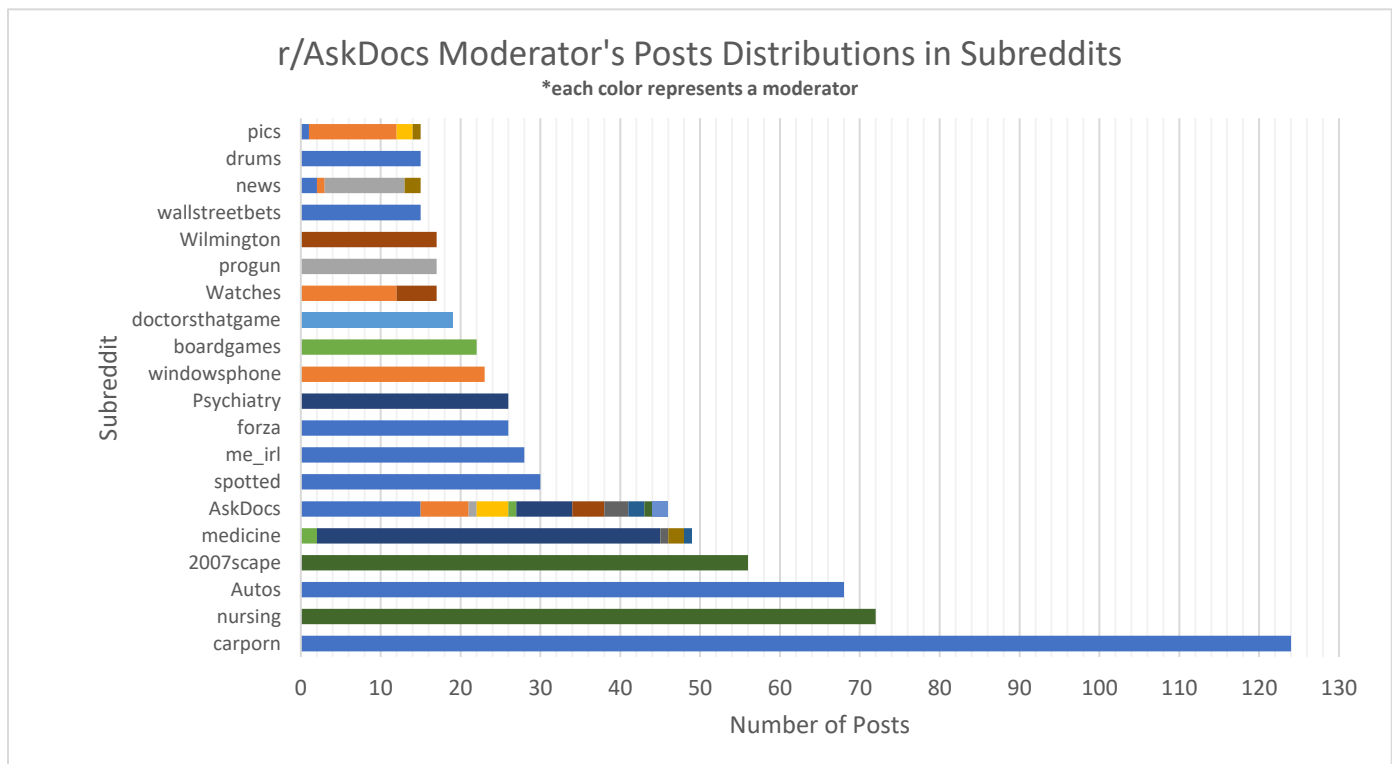


Analysis:

- As in r/politics, the prevalence of the words shown in the graph stem from an automatic template moderators use to warn or ban users.

## c. r/AskDocs Subreddit

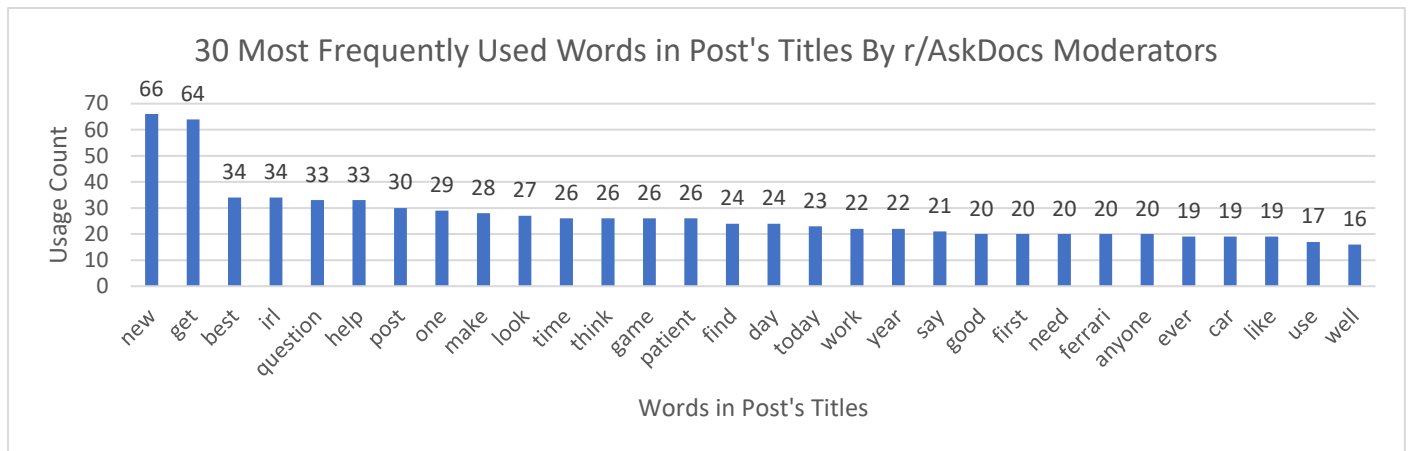
### c.1. r/AskDocs – Posts Distribution



#### Analysis:

- As opposed to r/politics and r/games we see that r/AskDocs moderator's posts are not concentrated to the subreddit they moderate.
- For example, we see a moderator that submitted 125 posts to r/carporn, which gathers the best car photography. The same moderator only submitted 15 posts in r/AskDocs. This makes sense since posts in r/AskDocs mainly represent medical questions from the public. Since the moderators in this case usually only answer medical questions through commenting, they only create posts if there is a need to notify the community about policy changes or events.
- Most of the other subreddits have no relation to medical topics.

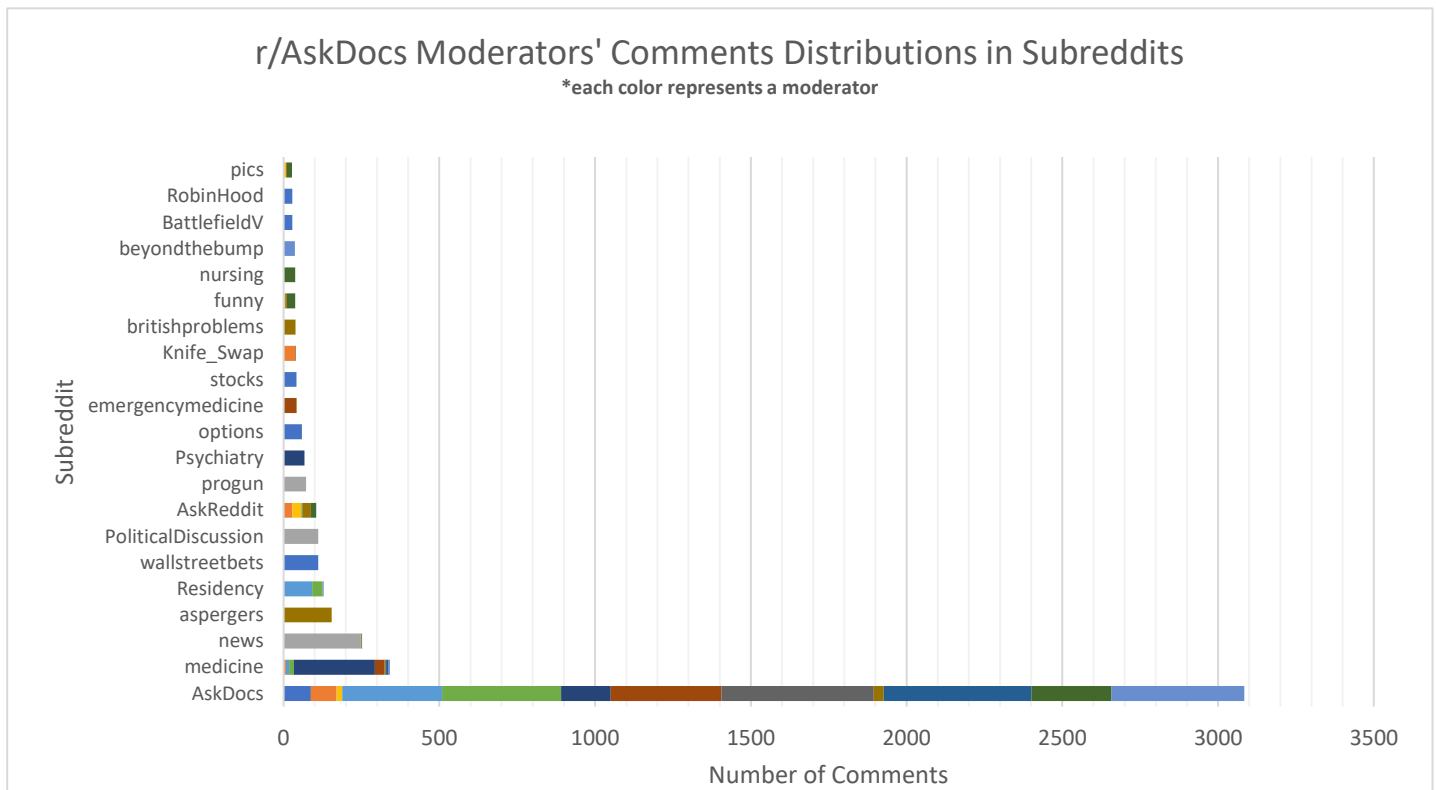
### c.2. r/AskDocs – Frequency of words in post's titles



Analysis:

- Since the posts of r/AskDocs moderators are scattered across all Reddit, we find it difficult to draw any concrete conclusions about the nature of their moderation.

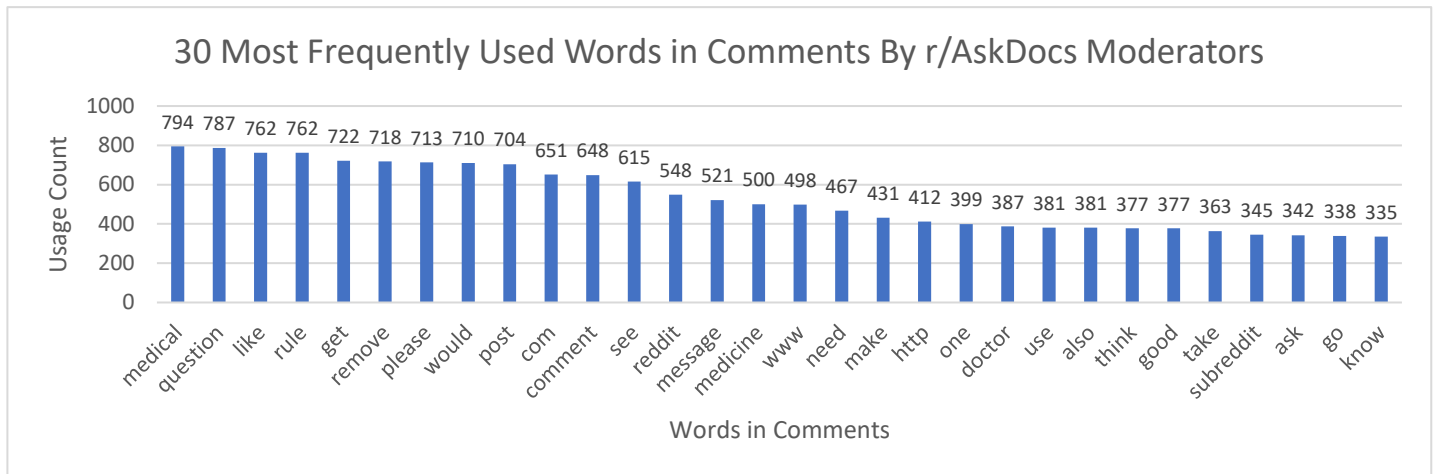
### c.3. r/AskDocs – Comments distribution



Analysis:

- r/AskDocs moderators mostly comment and active in r/AskDocs (~3000 comments).

#### c.4. r/AskDocs – Comments distribution



Analysis:

- As in r/politics, the prevalence of the words shown in the graph stem from automatic template moderators use to warn or ban users.

## 7. Conclusions

In this research we aimed to examine the level of involvement of moderators within their communities, focusing on three subreddits: r/politics, r/games, r/AskDocs. We reviewed the distributions of posts and comments of moderators across Reddit and analyzed the word frequency in the comments and in the titles of posts that moderators submit.

The conclusions are:

- Moderators are mostly active in the communities they moderate. This is expressed by the fact that when aggregated, moderators post and comment mainly in the subreddit they are responsible for.
- Even if moderators comment or post in other subreddits, many times those subreddits hold some resemblance in topic to the subreddit they moderate.
- Titles in the posts show that moderators either create threads to encourage discussions or to notify/warn participants about policy issues.
- The lack of adjectives implies that moderators do not express their own opinions in the titles of the posts they create.
- The most frequent words in the comments of moderators show the usage of an automated template for a comment. Moderators use this template to warn other users that they violated a specific rule and that they will suffer consequences (ban, comment removal, warning, etc.).
- Although the most frequent words in comments exhibit enforcement of policies, it does not mean that moderators do not participate in conversations and express their opinions. By manually sifting through comments, it is indeed visible that they do engage in conversations with users on some level, but as stated, they engage more in policy enforcement.

- In professional question-based subreddits such as r/AskDocs, it appears that moderators mostly comment/answer the questions of others, and less likely to create new posts. This happens because posts in these forums are almost always equal to questions, and since the moderator's job is to answer questions, there are fewer reasons for them to create posts.

Further research can include more subreddits and analyze additional parameters that represent involvement, for example: the amount of user bans or the number of removed posts by moderators, how many times discussions were locked, etc. We also encourage the possibility of discerning between active moderators and those who contribute less to avoid scenarios where only one moderator is extremely prolific while others are dormant – this scenario can potentially skew the results. Moreover, future studies can create numerical metrics to compare data statistically – although we relied on quantitative data, our conclusions were based upon our own observation, rather than rigorous mathematical measurements. In addition, further research can investigate if there is a correlation between the level of involvement of moderators in the community and the success of the subreddit.

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