

Reddit Mining to Understand Gendered Movements

Abeer Khan

University of Waterloo, Canada
abeer.khan@uwaterloo.ca

Lukasz Golab

University of Waterloo, Canada
lgolab@uwaterloo.ca

ABSTRACT

We mine gender-oriented Reddit forums, r/Feminism, r/MensRights, and r/TheRedPill, to understand gendered movements and their participants. Our methods include topic modelling using non-negative matrix factorization, and analyzing user commenting activity. Our analysis leads to three main findings. First, gendered forums discuss workplace sexism, personal safety, rape, and legal issues among other gender issues, and different forums have different perspectives on these issues. Second, users commenting on r/MensRights are similar to users who are politically right leaning and associated with sexist or racist content, whereas users commenting on r/Feminism are similar to those who support minorities, body acceptance, and survivors of sexual assault. Third, users commenting on r/TheRedPill are similar to those who do not believe in the equality of race or gender.

1 INTRODUCTION

Gender equality is one of the 17 United Nations Sustainable Development Goals. We observe that social media have recently been used to discuss sensitive gender-related issues, as evidenced by the hashtags #ididnotreport and #MeToo. Thus, our goal in this paper is to contribute to the understanding of gender issues through social media mining. We identified three large gender-oriented forums on Reddit: r/Feminism, r/MensRights, and r/TheRedPill, and we address the following questions.

- (1) What are the issues discussed on these forums?
- (2) What are the characteristics of users commenting on these forums?

To answer the first question, we use topic modelling, specifically non-negative matrix factorization. Since Reddit users are not required to reveal any personal information, we address the challenge of understanding users by analyzing their comments on other, gender-neutral, Reddit forums.

We discovered that the above gendered forums discuss issues such as family law, sexual violence, personal safety, dating, consent, media representation, workplace sexism, workplace harassment, criminal justice system, pink tax, and gender differences in education. However, different gendered movements offer different perspectives on these issues. For example, r/MensRights primarily discusses false rape accusations in addition to sexual assault faced by men, whereas r/Feminism primarily discusses sexual assault faced by women.

Furthermore, we found that users who comment on r/TheRedPill are similar to those who comment on r/MensRights and r/Incels (a forum for those describing themselves as “involuntarily celibate”), and to those who reject the idea of equality of race and gender. Second, users who comment on r/MensRights are similar to those commenting on politically conservative forums and those discussing content known to be racist and misogynist. Third, users

who comment on r/Feminism are similar to groups who are helpful to various minority groups (related to disability, race, and orientation), provide counseling to victims of sexual violence, and promote body acceptance.

The remainder of this paper is organized as follows. Section 2 discusses related work. Section 3 describes the data and methods. Section 4 presents the results, and Section 5 concludes the paper.

2 RELATED WORK

LaViolette et al. [21] examined over 670,000 comments made in two gendered forums on Reddit, Men’s Rights and Men’s Liberation. They used text classification models and qualitative analysis, and identified the linguistic features that distinguish Men’s Rights and Men’s Liberation. Words that were unique to Men’s Rights included criminality, law and the justice system-related words such as accusation, arrest, charge, etc. Men’s Liberation contained many more identity and emotion-oriented phrases such as gendered, feminine, vulnerable, and insecurity. Lucy et al. [24] also linguistically analyzed several gendered communities on Reddit. They found that these communities have few users in common but are textually similar, and that the same word is sometimes associated with different sentiments when used by different gendered communities. For example, the word “obsessed” is used positively by a community discussing female fashion but is used negatively by a Men’s Rights community. Furthermore, the comments made by female and male fashion advice groups had high text similarity, but low user similarity. These works were linguistic and did not focus on the topics or issues discussed, which we analyze in this work.

Field et al. [13] studied how individuals were portrayed in nearly 30,000 news articles covering the #MeToo movement. They found that these articles are sympathetic towards women who have experienced sexual harassment, and present accused men as powerful. In contrast, we examine the discourse of a movement rather than its media coverage, in order to understand the issues and people involved, rather than how they are portrayed.

A survey of Men’s Rights users on Reddit discovered that survey participants were mostly male, white, between the ages of 17 to 20, indifferent to religion, and politically strongly conservative [44]. However, this survey naturally suffers from a self-selection bias, whereas our analysis uses *all* of Men’s Rights discourses.

Next, we review research on analyzing the issues pursued by gendered movements.

Prior work shows that Feminism has focused on a variety of legal and social equality issues that influence women, evolving through the decades. These issues included the right to vote, equality in the workplace, and violence against women [8, 18, 33]. These analyses are either historical (documenting the Feminist movement throughout the 19th and 20th centuries) or qualitative (using interviews and surveys). Moreover, contemporary analysis of Feminism often focuses on sexual violence, for example examining the #MeToo and #Intersectionality movements [13, 43], whereas we analyze *all current* Feminist issues that emerge in Reddit discussions.

Table 1: Statistics of gendered subreddits

subreddit	# subscribers	# posts	# comments	# users
r/TheRedPill	250K	47K	1.6M	80K
r/MensRights	170K	80K	1.6M	100K
r/Feminism	90K	40K	170K	30K
r/AskMen	500K	200K	6.5M	330K
r/AskWomen	500K	170K	5.5M	250K

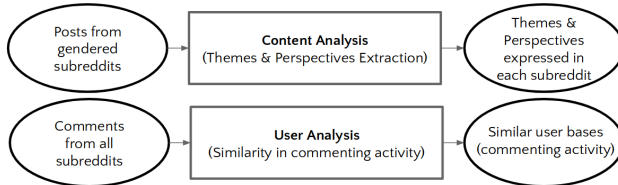


Figure 1: Overview of our methodology that uses posts and comments to understand content and people, respectively

Scholarly and popular media analyses of the issues discussed by movements such as Men’s Rights and The Red Pill are similarly historical or qualitative. Ging [16] analyzed the online discourse of The Red Pill and associated communities to identify theories about masculinity adopted by these communities. Men’s Rights groups were found to discuss issues such as family courts, male circumcision, domestic violence, and education [1, 26, 29, 40].

3 DATA AND METHODS

Reddit (reddit.com) is a social curation website where registered users submit content in the form of links or text posts. Users form interest-based forums called *subreddits* (for example, r/lifehacks or r/StarWars), and within these forums they *post* relevant content. Other users can *comment* on these posts. A subreddit’s name and optional description suggests the main interest of its users. We use the terms “forum”, “interest group”, and “subreddit” interchangeably. There are over a million different subreddits.

Similar to Lucy et al. [24], we identified the largest subreddits (in terms of the number of subscribers) with clearly gender-oriented names: r/TwoXChromosomes, r/AskMen, r/AskWomen, r/TheRedPill, r/TrollYChromosome, r/MensRights, r/Feminism. At the time of selection, all of these subreddits had more than 90,000 subscribers. We focus on r/TheRedPill, r/MensRights, and r/Feminism, which are aligned with gendered *movements*. We also compare these forums to r/AskMen and r/AskWomen, which are general Q&A forums seeking advice from men’s and women’s perspectives, respectively. We discard r/TwoXChromosomes since it is a “default” subreddit (to which users were automatically subscribed if they created a Reddit account before 2017). We also discard r/TrollYChromosome since we observed that its users primarily share images with little text.

Our analysis was conducted on data publicly available on Google Big Query¹. We use three years of Reddit posts and comments, from December 2015 to December 2018. The source code is available on our project [Github](https://github.com/abeer-khan/Reddit-Gender-Movements)². Table 1 shows the number of posts, comments, and subscribers associated with the gendered subreddits. Figure 1 summarizes our methodology, consisting of content analysis (topic modelling) and user analysis (commenting activity). We discuss the details below.

¹<https://cloud.google.com/bigquery/>

²<https://github.com/abeer-khan/Reddit-Gender-Movements>

Table 2: Number of posts remaining for content analysis

Gendered subreddit	Before cleaning		After cleaning	
	#	#	#	%
r/TheRedPill	47K	8K	18.2%	
r/MensRights	80K	8K	10.9%	
r/Feminism	40K	2K	4.5%	
r/AskMen	200K	20K	9.5%	
r/AskWomen	170K	7K	4.6%	

0: peopl think would one make thing see even use good way like person know someth
 1: woman man abort respons would husband wrong say hit kill life word murder even
 2: women men oppress power less societi treat even war sexist stem children mani differ also
 ...

Figure 2: Sample topic descriptors produced by NMF for r/Mensrights. Uninformative words are circled.

3.1 Content Analysis

For each gendered subreddit, we run topic modelling over the posts to extract the topics being discussed. We omit comments on posts as we found them to contain little additional information about the topic.

Preprocessing: We perform standard text preprocessing such as word stemming and stopword removal, removal of rare (occurring in under 1% posts) and frequent (occurring in over 95% posts) words, as well as other social media specific pre-processing using Ekphrasis [3]. Following prior work on Reddit text mining [19], we discard posts that are too short (fewer than 256 characters) or too long (over 4096 characters). Table 2 shows the number of posts remaining for analysis (there were many short posts that were discarded). We express each post as a Term Frequency - Inverse Document Frequency (tf-idf) vector.

Topic Modelling: Next, for each of the five gender-oriented subreddits, we run the Non-negative Matrix Factorization (NMF) topic modelling algorithm [42]³. We set K , the number of topics, to 50⁴. NMF extracts K topics in the form of “topic descriptors” (ranked lists of words that describe each topic). It also produces a ranked list of most suitable topics for each post, and we label each post with its top-ranked topic.

Figure 2 shows examples of the topic descriptors produced by NMF for r/MensRights. We observed many *uninformative* terms despite our preprocessing. These terms did not provide information about what is distinctive about a topic. They included terms such as “would”, “else”, and “also”, besides domain-specific terms such as “woman” and “man” that are common in gendered text. We removed these words from the posts and re-executed NMF to discover more informative topic descriptors. We thus iteratively built a custom stop-list of uninformative terms until NMF produced topic descriptors without any uninformative words in its top 15 words. Custom stop-lists have had to be similarly iteratively built by prior work using topic modelling [7, 37].

Perspectives: We use NMF to extra 50 topics from each of the five gendered subreddits. We read these 250 topic descriptors, and

³We tested two other topic modelling algorithms: LDA and SeaNMF [35]. However, as observed in previous work [31], we found that many topics produced by LDA were redundant, i.e., several topics were described with the same words. Furthermore, SeaNMF and NMF produced similar topics for the same values of K , but NMF was faster. Since topic modelling relies on an interactively built custom stop-list, we chose a model that converges (and hence can be iterated over) faster.

⁴We tested different values of K between 10 and 400, and found that smaller values of K produced topics that were too broad, whereas larger values of K led to duplicate topics.

Table 3: Similar topics discussed in different subreddits

r/MensRights	r/Feminism
33: rape rapist cultur sex consent fals drunk report teach crime law convict fact campus forc	2: rape victim accus blame rapist report percent violenc porn drunk case consent alleg fals india

15-20 random posts clustered under each topic. We noticed that several topics in different (and often within the same) subreddits referred to similar themes, and that different subreddits may have different opinions on the same topic. For example, consider the two topics shown in Table 3 that demonstrate a similar topic (*rape*) discussed in both r/MensRights and r/Feminism (albeit, upon our reading, slightly differently).

Themes: Based on our reading of the topic descriptors and sample posts, we manually merge similar topics and assign labels to them. After merging, we obtain 24 topics, which we refer to as *themes*. Examples of themes include Work, Family, and Education; see Table 4 for a complete list. As we will show, these themes may be discussed with different perspectives in different gendered subreddits.

3.2 Commenting Similarity

We now identify other subreddits that users commenting on r/Feminism, r/MensRights and r/TheRedPill are similar to in terms of their interests. The intuition behind our method is as follows. If we find that, say, the users commenting on r/MensRights and the users commenting on r/gardening also comment on the same additional subreddits, then we would conclude that the users of r/MensRights and r/gardening are similar [25].

In this analysis, we express each subreddit in terms of how many users (defined as those who commented in it at least once) it has in common with all the *informative* subreddits on Reddit; our definition of informativeness will be clarified shortly. For now, assume that there are only two informative subreddits: r/pets and r/gardening. We calculate the number of users each of r/Feminism, r/MensRights and r/TheRedPill have in common (also called user overlap) with each of r/pets and r/gardening. These user overlaps are represented as the axes in Figure 3, and each subreddit is represented as a vector. In the figure, for example, r/Feminism is assumed to have three users in common with r/gardening and six with r/pets.

We measure the distance between subreddits using cosine similarity. There are 91292 subreddits where a user has commented at least once.

Similar to how text mining methods only use informative terms that are not too rarely or too frequently used, we only measure user overlap with informative subreddits, defined as those which are commented on by enough users as well as not too many users. Specifically, we rank subreddits by the number of distinct users who have commented on them and choose the subreddits ranked between the top 200 to 2000. There were 2047 such informative subreddits, referred to as *I*. The top 200 subreddits are extremely popular and every subreddit has many users in common with them. Conversely, subreddits ranked below 2000 are not as popular and no other subreddit has many users in common with them.

Furthermore, we convert the user overlap between each pair of subreddits into positive pointwise mutual information (PPMI),

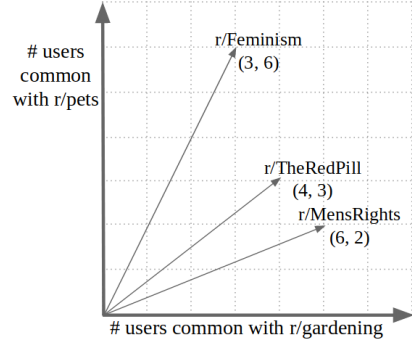


Figure 3: Every subreddit can be expressed as a vector of user overlap values with informative subreddits, later converted to PPMI. Subreddits whose user bases have more similar interests will have a higher cosine similarity.

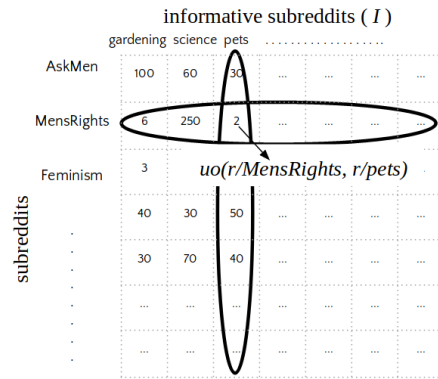


Figure 4: Subreddit user overlap matrix. Each cell is converted into its PPMI.

analogous to converting term frequencies to tf-idf [30]. For example, converting the user overlap between r/MensRights and r/pets, represented as $uo(r/MensRights, r/pets)$, to PPMI involves normalizing the overlap by the total number of users r/MensRights has in common with the subreddits in *I* (i.e., the informative subreddits, horizontally circled in Figure 4), and with the total number of users r/pets has in common with other subreddits (vertically circled in Figure 4). We then find the logarithm (base 2) of this normalized value and we zero out negative values. Equations 1 – 3 summarize this process for any two subreddits with indices *m* and *n*, represented as s_m and s_n respectively.

$$normalize(s_m, s_n) = \frac{uo(s_m, s_n)}{\sum_{s_i \in I} uo(s_m, s_i) \times \sum_{s_j=1}^{91292} uo(s_n, s_j)} \quad (1)$$

$$PMI(s_m, s_n) = \log_2 [normalize(s_m, s_n)] \quad (2)$$

$$PPMI(s_m, s_n) = \begin{cases} PMI(s_m, s_n), & \text{if } PMI(s_m, s_n) \geq 0 \\ 0, & \text{otherwise} \end{cases} \quad (3)$$

This commenting similarity method is akin to Latent Semantic Analysis (LSA), a natural language processing technique to determine document similarity.

3.3 Limitations and Assumptions

There are several limitations of our methodology.

- (1) The iterative building of custom stop-lists for topic modelling and organizing topics into themes is subjective.
- (2) To decide whether a theme is popular within a subreddit, we only count the number of posts labelled as belonging to that theme. We do not consider the number of comments, views, upvotes or downvotes.
- (3) Our user analysis involves retrieving subreddits most similar to gendered subreddits. Thus, our results *only represent user interests on Reddit*. We cannot capture user interests that are not explicitly represented as Reddit forums. For example, if the users of r/MensRights are interested in gardening, but there is no gardening subreddit, then we would not discover the interest of r/MensRights users in gardening.

Furthermore, we emphasize that we do not attempt to verify whether or not the claims made by movements are true.

4 RESULTS

We now present the results of our content analysis (Section 4.1) and user analysis (Section 4.2).

4.1 Themes and Perspectives

We discovered 24 themes discussed across gendered subreddits. Table 4 lists the themes and the proportion of posts in each subreddit that discuss each theme.

Not all themes are equally discussed by all subreddits. *Gendered Movements, Political Issues, Criminal Justice System, and Other Social Issues* were mentioned only by the three gendered movement subreddits. Other themes were discussed only in r/AskMen and r/AskWomen. These were *Drinking, Cars, Other Health Issues, Living Concerns, Food, Age, and Hobbies*. Most themes were discussed across several subreddits in different contexts.

We now examine the contexts in which different subreddits discussed various themes. Due to space constraints, we discuss only *Health / Abuse* in detail and we summarize some of the other themes and perspectives in Figures 6 – 15. These figures do not show the perspectives of r/AskMen and r/AskWomen, for which we found fewer differences in perspectives than for the movement subreddits.

- Posts in both r/Feminism and r/MensRights discuss topics such as rape, harassment, consent, and culture (for example, hookup, sex, or rape culture in society).
- r/Feminism posts seek help for dealing with violence faced in one’s life. Posts also mention societal problems such as rape jokes and rape culture.
- r/MensRights posts similarly seek help dealing with violence against men. Posts also discuss repercussions of accusations against men, with topics such as false accusations, due process, and regret after sexual encounters. r/MensRights posts discuss other forms of abuse against men, for example, male genital mutilation (MGM, or childhood circumcision) and domestic violence against men. They also discuss health problems such as increasing rates of suicide and mental health issues among men.
- r/TheRedPill posts are noticeably different than r/MensRights and r/Feminism. r/TheRedPill posts discuss rape in the context of false accusations, mentioning how concepts such as feminine imperative, social justice warriors, or Feminism could contribute to women falsely accusing men of rape. r/TheRedPill posts also talk about the emotional manipulation of and by women.

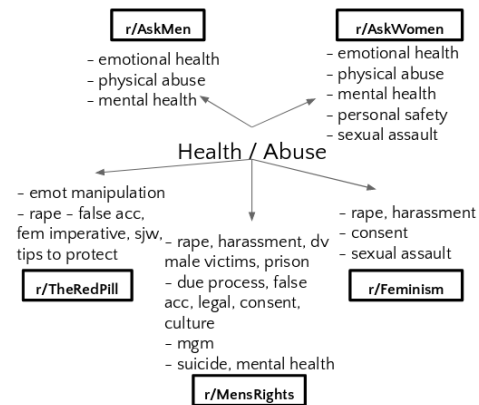


Figure 5: Perspectives on *Health / Abuse*.

- r/AskMen and r/AskWomen posts describe dealing with emotions, physical abuse, mental health issues, and finding happiness. r/AskWomen posts additionally refer to personal safety and sexual assault.

There were similar differences in perspectives in most of the other themes. For example, r/TheRedPill posts mention race in the context of femininity, opining that black women may be less feminine, whereas r/MensRights posts discuss racial bias against men such as a higher number of rape accusations against black men, and racism against non-minority races (Figure 7).

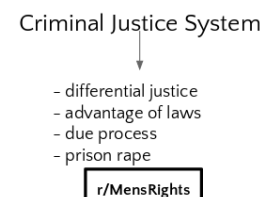


Figure 6: Perspectives on *Criminal Justice System*.

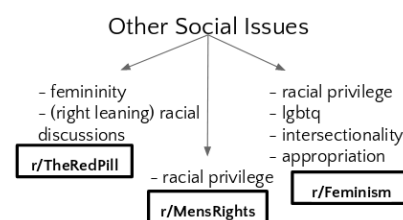


Figure 7: Perspectives on *Other Social Issues*.

Drinking, Cars, Other Health Issues, Living Concerns (for instance, roommates or affordable housing), Food, Age, and Hobbies were discussed only by r/AskMen and r/AskWomen, and in similar contexts.

4.2 User Interest Similarity

In this section, we discuss the people involved in gendered movements. We examine the subreddits that are most similar to r/TheRedPill, r/MensRights, and r/Feminism in terms of their user interests, as measured by where they comment. The user bases of two subreddits are similar to each other in terms of interest if they tend to comment on discussions in the same subreddits. The groups who

Table 4: Themes discussed across gendered forums. The % for each subreddit is with respect to the total # of posts in that subreddit. The "Total" % is with respect to the total # of posts in our corpus. Some topics were deemed too noisy and were discarded (bottom row)

Ind	Themes	r/AskMen		r/AskWomen		r/TheRedPill		r/MensRights		r/Feminism		Total	
		#	%	#	%	#	%	#	%	#	%	#	%
1	Self Esteem / Grooming	2341	18.40	1305	26.12	1480	21.64	0	0	42	3.02	5168	15.31
2	Dating / Flirting	2981	23.43	893	17.87	1351	19.76	0	0	28	2.01	5253	15.56
3	Relationships	2124	16.69	903	18.07	990	14.48	714	9.14	61	4.38	4792	14.19
4	Work	1175	9.23	563	11.27	180	2.63	384	4.91	87	6.25	2389	7.08
5	Family	869	6.83	175	3.50	484	7.08	795	10.17	29	2.08	2352	6.97
6	Sex / Pornography	957	7.52	208	4.16	426	6.23	0	0	58	4.17	1649	4.88
7	Gendered Movements	0	0	0	0	1887	27.60	1059	13.55	256	18.39	3202	9.48
8	Other Gender Issues	0	0	199	3.98	190	2.78	811	10.38	271	19.47	1471	4.36
9	Media	0	0	168	3.36	288	4.21	876	11.21	138	9.91	1470	4.35
10	Education	688	5.41	0	0	156	2.28	541	6.92	51	3.66	1436	4.25
11	Money	412	3.24	149	2.98	180	2.63	178	2.28	0	0	919	2.72
12	Health / Abuse	575	4.52	569	11.39	314	4.59	1414	18.10	127	9.12	2999	8.88
13	Political Issues	0	0	0	0	0	0	157	2.01	68	4.89	225	0.67
14	Reproductive Issues	0	0	139	2.78	0	0	146	1.87	24	1.72	309	0.92
15	Criminal Justice System	0	0	0	0	0	0	201	2.57	0	0	201	0.60
16	Sports / Video Games	435	3.42	134	2.68	0	0	0	0	26	1.87	595	1.76
17	Other Social Issues	0	0	0	0	130	1.90	182	2.33	109	7.83	421	1.25
18	Drinking	344	2.7	0	0	0	0	0	0	0	0	344	1.02
19	Cars	275	2.16	0	0	0	0	0	0	0	0	275	0.81
20	Other Health Issues	0	0	141	2.82	0	0	0	0	0	0	141	0.42
21	Living Concerns	381	2.99	322	6.45	0	0	0	0	0	0	703	2.08
22	Food	316	2.48	0	0	0	0	0	0	0	0	316	0.94
23	Age	288	2.26	137	2.74	0	0	0	0	0	0	425	1.26
24	Hobbies	249	1.96	134	2.68	0	0	0	0	0	0	383	1.13
Total		14410	38.49	6139	16.40	8056	21.52	7458	19.92	1375	3.67	37438	100
Noisy posts discarded		4363		1588		485		1181		422		8039	

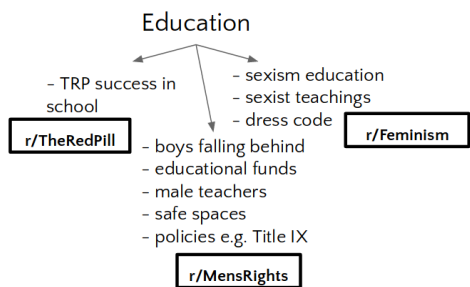


Figure 8: Perspectives on Education.

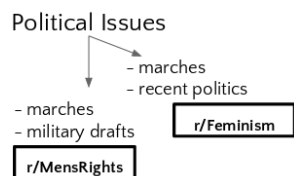


Figure 9: Perspectives on Political Issues.

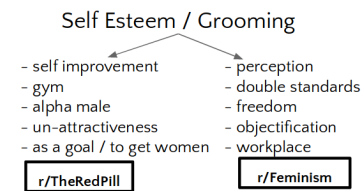


Figure 10: Perspectives on Self Esteem / Grooming.

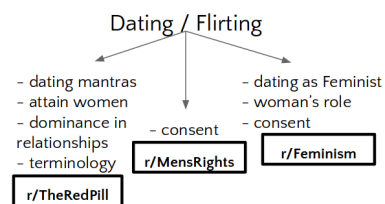


Figure 11: Perspectives on Dating / Flirting.

are most similar to the people involved in gendered subreddits are shown in Table 5. Following are the key insights.

- The user bases of r/TheRedPill and r/MensRights are similar to each other.
- r/TheRedPill users are similar to those interested in r/sexduction, r/steroids, r/NoFap (for abstaining from pornography and

masturbation, often to the benefit of one's social life), other movements related to red pill theories (such as r/marriedredpill, r/PurplePillDebate, r/RedPillWomen, and r/askMRP), and some social movements associated with men (for example, r/MGTOW (Men Going Their Own Way), r/MensRights, and r/Incels).

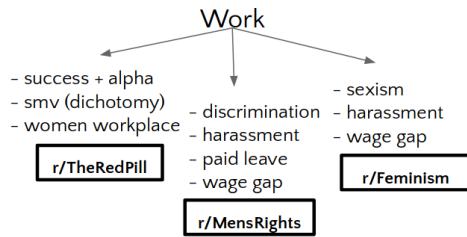


Figure 12: Perspectives on *Work*.

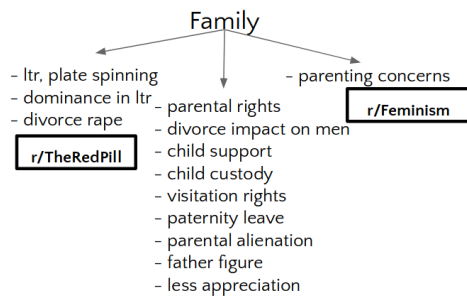


Figure 13: Perspectives on *Family*.

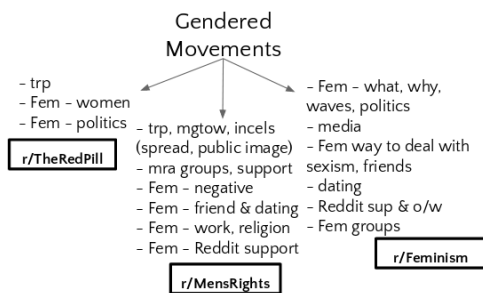


Figure 14: Perspectives on *Gendered Movements*.



Figure 15: Perspectives on *Sports / Video Games*.

- r/TheRedPill users are also similar to the user base of r/DarkEnlightenment, a subreddit that is anti-liberal, anti-democratic, and anti-egalitarianism (in terms of both gender and race).
- r/TheRedPill is similar to a subreddit dedicated to the work of Jordan Peterson, a Canadian psychologist and professor who calls for a return to traditional gender roles [22].
- r/MensRights users are similar to those of subreddits that are politically right leaning (e.g., r/HillaryForPrison, r/Ask_The_Donald, r/Conservative, r/Libertarian, r/altright).
- r/MensRights is similar to r/MGTOW users.
- r/MensRights users are also similar to the user bases of r/KotakuInAction and r/CringeAnarchy, known to contain racist and sexist content. They are further similar to people who discuss social justice warriors and their faults (r/SRSsucks and r/SocialJusticeInAction).

- The users of r/Feminism are similar to those with a positive attitude towards social justice (r/socialjustice101 and r/SRSDiscussion). They are also similar to the user bases of minority groups (e.g., r/genderqueer, r/bisexual, and r/blackladies).
- Other groups r/Feminism is similar to include disabilities (e.g., r/ADHD, r/disability, and r/aspbergirls), gaming (r/GirlGamers), rape counseling, and a forum to share emotional issues (r/offmychest).
- r/Feminism users are also similar to an interest group against r/MensRights (r/againstmensrights), and to a forum dedicated to discussing men's rights in a positive light (r/MensLib). According to r/MensLib's administrators, r/MensRights and r/MensLib are not the same.
- There are no interest groups that both r/MensRights and r/Feminism are similar to, nor are they similar to each other.
- The users of r/MensRights and r/Feminism are similar to the users of many other subreddits, the top few of which are shown in Table 5. Consistent with previous sections, the users of r/AskMen and r/AskWomen are similar to each other. They are similar to those interested in relationships, dating, divorce, sex, jobs, and other general advice. The subreddits that r/AskMen is similar to but r/AskWomen is not are: r/asktrp (ask the red pill), r/PurplePillDebate (neutral discussion of sex and gender), r/socialskills, r/seduction, and a few others pertaining to looks (r/amiugly and r/tall). Subreddits similar to r/AskWomen but not r/AskMen are related to health (often women's), parenting, self-grooming, legal advice, etc.

5 DISCUSSION AND CONCLUSIONS

We presented a data mining study of social movements related to gender using a large social media corpus (Reddit). We used text mining and user overlap methods to understand the issues being discussed by, and the people involved with, these movements. Our main findings are as follows.

- (1) r/TheRedPill discusses daily life topics such as dating, power, and women using a distinctive shared vernacular and mantras. Prior work has also observed the existence of such a collective identity among r/TheRedPill users [12].
- (2) r/TheRedPill users are similar to those of Men Going Their Own Way (MGTOW), Incels, and Men's Rights subreddits, perhaps because they use similar red / blue / black pill metaphors to describe their beliefs [23, 39]. A person who accepts the red pill has realized the gynocentric injustice in the world. r/TheRedPill users are also similar to people who reject egalitarianism of race or gender. Moreover, they are similar to the people who are interested in r/JordanPeterson. This could be a reason for (or a result of) their perspectives on relationships and dating (including their discussions on race and femininity).
- (3) r/MensRights posts are political, and discuss issues that posters believe affect men more than women; e.g., family law, health, money, abuse, relationships, and education, where they discuss systems biased in favour of women, and false rape accusations. This has been observed in Men's Rights groups in the past [1, 2, 17, 28, 29].
- (4) r/MensRights users are similar to those of politically conservative subreddits, confirming prior observations of the conservative ideologies of Men's Rights activists [4, 9, 27,

Table 5: Subreddits similar to gendered subreddits in terms of commenting activity

Subreddit	Similar subreddits
r/TheRedPill	asktrp, MGTOW, seduction, marriedredpill, PurplePillDebate, WhereAreAllTheGoodMen, askMRP, JordanPeterson, NoFap, DarkEnlightenment, RedPillWomen, Incels, MensRights, steroids
r/MensRights	uncensorednews, sjwhate, pussypassdenied, SocialJusticeInAction, SRSucks, PussyPass, HillaryForPrison, HillaryMeltdown, WhereAreAllTheGoodMen, subredditcancer, ShitPoliticsSays, ImGoingToHellForThis, conspiracy, OffensiveSpeech, AskThe_Donald, Libertarian, TumblrInAction, atheism, Bad_Cop_No_Donut, alright, undelete, Documentaries, Drama, The_Donald, FeMRADebates, antifa, KotakuInAction, worldpolitics, AskTrumpSupporters, Conservative, MGTOW, TheRedPill, Shitstatistssay, DebateAltRight, nottheonion, rage, CringeAnarchy
r/Feminism	FemmeThoughts, badwomensanatomy, GirlGamers, GenderCynical, genderqueer, feminisms, bisexual, AskTrollX, againstmensrights, disability, BodyAcceptance, ADHD, blackladies, women, vegetarian, TwoXChromosomes, asexuality, TheBluePill, TransSpace, childfree, SRSDiscussion, MensLib, AskFeminists, Lgbt, transgender, raisedbyborderlines, AskWomenOver30, TrollXChromosomes, aspergirls, vegan, AskWomen, GenderCritical, pagan, socialjustice101, polyamory, offmychest, ainbow, exchristian, LesbianActually, actuallesbians, TheGirlSurvivalGuide, raisedbynarcissists, rapecounseling
r/AskMen	OkCupid, dating_advice, relationship_advice, AskMenOver30, datingoverthirty, dating, relationships, Advice, AskWomen, askwomenadvice, sex, offmychest, socialskills, confession, ... 18 more subreddits
r/AskWomen	relationships, TheGirlSurvivalGuide, TwoXChromosomes, TrollXChromosomes, askwomenadvice, offmychest, childfree, raisedbynarcissists, SkincareAddiction, ... 383 more subreddits

- 44]. Conservative viewpoints also contribute to, or are gravitated towards because of, the different perspectives on topics such as rape – some stances Men’s Rights takes (for instance, discussions of due process, Title IX, male disposability, father figures) are similar to reports from right leaning media such as Breitbart and Fox News [6, 38]. r/MensRights users are similar to those who express a dislike for social justice warriors, as echoed by observations in popular media [5]. They are similar to communities known to have sexist and racist undertones, which may explain the accusations of misogyny and racism that have been made against Men’s Rights activists in the past [14, 27]. They are also similar to an atheism-related group, which falls in line with a prior small scale survey on r/MensRights, where 94% of survey respondents did not subscribe to a religion [44].
- (5) r/Feminism posts are also political and discuss issues that impact women as well as other minorities. These issues include workplace sexism, workplace harassment, rape, abuse, pink tax, cultural appropriation, and representation. These issues have been observed to be relevant among other Feminist groups as well [8, 10, 11, 15, 20, 34, 36].
 - (6) r/Feminism users are similar to minority groups spanning race, orientation, and disability. They are also similar to those involved with body acceptance subreddits, in line with the finding that exposure to Feminist theories is correlated with positive changes in body image among women [32]. They are similar to r/rapecounseling that provides support to victims of sexual violence. This may be a manifestation of recent Feminist usage of internet tools to help combat sexual violence [43]. r/Feminism is similar to r/GirlGamers, a venue for women gamers to discuss and engage in gaming, and discuss the influence of their gender on their gaming experiences. This user similarity may have influenced r/Feminism’s perspectives on *Sports / Video Games*. r/Feminism is also similar to r/againstmensrights, which is interesting since Men’s Rights has been said to be a reactionary movement to Feminism in prior work [1, 41]. On the other hand, r/Feminism is similar to r/MensLib. r/MensLib represents the Men’s

- Liberation movement that discusses men’s issues and is an ally to feminism, as opposed to the men’s rights, red pill, and incel movements.
- (7) People involved with r/TheRedPill and r/MensRights are similar. This could be attributed to the interest both subreddits have in conservative politics. Dignam et al. [12] showed that r/TheRedPill forum contributed to Trump’s election although the community is generally apolitical.
 - (8) In contrast, r/MensRights and r/Feminism users are dissimilar. This could be because of the anti-Feminist roots of the Men’s Rights Movement [1, 41], that are echoed in r/MensRights posts discussing *Gendered Movements*.
 - (9) Finally, we compare movements related to gender with generic gendered subreddits (r/AskMen and r/AskWomen). Understandably, these generic gendered subreddits do not contain much political content. The users of these groups, the themes they discuss, and their perspectives are more similar to each other. The only difference is that r/AskWomen discusses personal safety, assault, reproductive issues, saying no when dating, and sexism.

We emphasize that our results should be used carefully due the following confounding factors.

- a. **Choice of platform:** Over two-thirds of Reddit users are male, and majority are young adults⁵. Our results may be dominated by the users in this demographic. They may also not be representative of people who are involved with gendered movements, but do not use Reddit.
- b. **Choice of subreddits:** Our decision to use larger subreddits provides evidence to support our results but also ignores the opinions of smaller groups of people involved with these movements. For example, our results may not be representative of the people who frequent r/RedPillWomen (30,000 subscribers) and r/male_feminists (72 subscribers).
- c. **Choice of users:** We defined users as those who post (to identify issues) or comment (to understand people). Our results are not representative of those involved more passively, such as those who only read content.

⁵<https://www.pewinternet.org/2013/07/03/6-of-online-adults-are-reddit-users/>

We believe that our findings are relevant to policy decisions regarding men and women. We provide examples below.

- (1) **Workplace:** It is important to establish guidelines on acceptable workplace etiquette, communication, and behaviour, in addition to guidelines on what to do if these expectations are not met.
- (2) **Personal safety:** Our analysis of comments on gendered forums indicates that some users do not feel safe in the workplace, in their homes, or on the streets. This suggests that personal safety remains an important issue.
- (3) **Counseling:** The support provided by r/rapecounseling highlights the importance of support for victims of rape and violence.
- (4) **Health:** Governments may investigate systemic health issues such as mental health problems and suicide, which are frequently mentioned in men's movement discussions.
- (5) **Attitudes towards abuse:** Online users who attribute rape (or accusations) to concepts such as feminine imperative could benefit from exposure to different perspectives.
- (6) **Legal and societal help:** Our analysis demonstrated the need for policy discussion in the context of legal and societal help for gender-oriented issues such as military drafts, workplace safety, and prison rape.

REFERENCES

- [1] Jonathan A Allan. 2016. Phallic affect, or why men's rights activists have feelings. *Men and Masculinities* 19, 1 (2016), 22–41.
- [2] Amy B Aronson et al. 2004. *Men and Masculinities: AJ*. Vol. 1. ABC-CLIO.
- [3] Christos Baziotis, Nikos Pelekis, and Christos Doukeridis. 2017. Datasories at semeval-2017 task 4: Deep lstm with attention for message-level and topic-based sentiment analysis. In *Proceedings of the 11th international workshop on semantic evaluation (SemEval-2017)*. 747–754.
- [4] Judy Berman. 2009. "Men's rights" groups go mainstream https://www.salon.com/test/2009/11/05/mens_rights/. Accessed: 2019-07-26.
- [5] Judy Berman. 2015. "Men's rights" groups go mainstream <https://www.vox.com/2015/2/5/7942623/mens-rights-movement>. Accessed: 2019-07-26.
- [6] Dr. Susan Berry. 2018. Feminists Rage over Trump Admin Push for Due Process in Campus Sexual Misconduct Allegations <https://www.breitbart.com/politics/2018/09/04/feminists-rage-over-trump-admin-push-for-due-process-in-campus-sexual-misconduct-allegations>. Accessed: 2019-07-26.
- [7] Antoine Blanchard. 2007. Understanding and customizing stopword lists for enhanced patent mapping. *World Patent Information* 29, 4 (2007), 308–316.
- [8] Prudence Chamberlain. 2017. *The feminist fourth wave: Affective temporality*. Springer.
- [9] Robert W Connell. 2005. Change among the gatekeepers: Men, masculinities, and gender equality in the global arena. *Signs: Journal of Women in Culture and Society* 30, 3 (2005), 1801–1825.
- [10] Mia Consalvo. 2012. Confronting toxic gamer culture: A challenge for feminist game studies scholars. *Ada: A Journal of Gender, New Media, and Technology* 1, 1 (2012), 1–6.
- [11] Kimberle Crenshaw. 1989. Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. *u. Chi. Legal f.* (1989), 139.
- [12] Pierce Alexander Dignam and Deana A Rohlinger. 2019. Misogynistic Men Online: How the Red Pill Helped Elect Trump. *Signs: Journal of Women in Culture and Society* 44, 3 (2019), 589–612.
- [13] Anjalie Field, Gayatri Bhat, and Yulia Tsvetkov. 2019. Contextual Affective Analysis: A Case Study of People Portrayals in Online# MeToo Stories. In *Proceedings of the International AAAI Conference on Web and Social Media*. Vol. 13. 158–169.
- [14] David Futrelle. 2019. The 'alt-right' is fueled by toxic masculinity — and vice versa <https://www.nbcnews.com/think/opinion/alt-right-fueled-toxic-masculinity-vice-versa-ncna989031>. Accessed: 2019-07-26.
- [15] Jane Gerhard. 2001. *Desiring Revolution: Second-Wave Feminism and the Rewriting of Twentieth-Century American Sexual Thought*. Columbia University Press.
- [16] Debbie Ging. 2017. Alphas, betas, and incels: Theorizing the masculinities of the manosphere. *Men and Masculinities* (2017), 1097184X17706401.
- [17] Chris Haywood and Mairtin Mac an Ghaill. 2013. *Education and Masculinities: Social, cultural and global transformations*. Routledge.
- [18] Maggie Humm. 1995. The dictionary of feminist theory. Columbus. *OH: Ohio State University* (1995).
- [19] Mike Swarbrick Jones. 2018. The Reddit Self-Post Classification Task (RSPCT): a highly multiclass dataset for text classification (PREPRINT). (2018).
- [20] Michael S Kimmel. 1995. *The politics of manhood: Pro feminist men respond to the mythopoetic men's movement (and the mythopoetic leaders answer)*. Temple University Press.
- [21] Jack LaViolette and Bernie Hogan. 2019. Using Platform Signals for Distinguishing Discourses: The Case of Men's Rights and Men's Liberation on Reddit. In *Proceedings of the International AAAI Conference on Web and Social Media*. Vol. 13. 323–334.
- [22] Alison Lefkowitz. 2018. Jordan Peterson and the return of the men's rights movement https://www.washingtonpost.com/news/made-by-history/wp/2018/07/24/before-jordan-peterson-there-were-mens-rights-activists/?noredirect=on&utm_term=.900c1ec53b42. Accessed: 2019-05-17.
- [23] Jie Liang Lin. 2017. Antifeminism Online. MGTOW (Men Going Their Own Way). (2017).
- [24] Li Lucy and Julia Mendelsohn. 2018. Using Sentiment Induction to Understand Variation in Gendered Online Communities. *arXiv preprint arXiv:1811.07061* (2018).
- [25] Trevor Martin. 2017. Dissecting Trump's most rabid online following. *FiveThirtyEight* (2017).
- [26] Angela Melville and Rosemary Hunter. 2001. As everybody knows-countering myths of gender bias in family law. *Griffith L. Rev.* 10 (2001), 124.
- [27] Robert Menzies. 2007. Virtual backlash: Representations of men's 'rights' and feminist 'wrongs' in cyberspace. *Reaction and resistance: Feminism, law, and social change* (2007), 65–97.
- [28] Michael A Messner. 1997. *Politics of masculinities: Men in movements*. Altamira Press.
- [29] Susan Miller. 2005. *Victims as offenders: The paradox of women's violence in relationships*. Rutgers University Press.
- [30] Yoshiki Niwa and Yoshihiko Nitta. 1994. Co-occurrence vectors from corpora vs. distance vectors from dictionaries. In *Proceedings of the 15th conference on Computational linguistics-Volume 1*. Association for Computational Linguistics, 304–309.
- [31] Derek O'callaghan, Derek Greene, Joe Carthy, and Pádraig Cunningham. 2015. An analysis of the coherence of descriptors in topic modeling. *Expert Systems with Applications* 42, 13 (2015), 5645–5657.
- [32] Rachel D Peterson, Stacey Tantleff-Dunn, and Jeffrey S Bedwell. 2006. The effects of exposure to feminist ideology on women's body image. *Body Image* 3, 3 (2006), 237–246.
- [33] Walker Rebecca. 1992. Becoming the Third Wave. *Ms.(January)* (1992).
- [34] Jacob Roberts. 2017. Women's Work <https://www.sciencehistory.org/distillations/magazine/womens-work>. Accessed: 2019-07-26.
- [35] Tian Shi, Kyeongpil Kang, Jaegul Choo, and Chandan K Reddy. 2018. Short-text topic modeling via non-negative matrix factorization enriched with local word-context correlations. In *Proceedings of the 2018 World Wide Web Conference*. International World Wide Web Conferences Steering Committee, 1105–1114.
- [36] Jennifer L Stevens and Kevin J Shanahan. 2017. Structured Abstract: Anger, Willingness, or Clueless? Understanding Why Women Pay a Pink Tax on the Products They Consume. In *Creating Marketing Magic and Innovative Future Marketing Trends*. Springer, 571–575.
- [37] Andrew Toulis and Lukasz Golab. 2017. Social Media Mining to Understand Public Mental Health. In *Vldb Workshop on Data Management and Analytics for Medicine and Healthcare*. Springer, 55–70.
- [38] Suzanne Venker. 2018. Missing fathers and America's broken boys - the vast majority of mass shooters come from broken homes <https://www.foxnews.com/opinion/missing-fathers-and-americas-broken-boys-the-vast-majority-of-mass-shooters-come-from-broken-homes>. Accessed: 2019-08-09.
- [39] The Week. 2015. Men's rights movement: why it is so controversial? <https://www.theweek.co.uk/people/62607/mens-rights-movement-why-it-is-so-controversial>. Accessed: 2019-07-26.
- [40] Lara Whyte. 2018. "Young men should be furious": inside the world's largest gathering of men's rights activists <https://www.opendemocracy.net/en/5050/young-men-should-be-furious-inside-worlds-largest-mens-rights-activism/>. Accessed: 2019-07-26.
- [41] Rhys H Williams. 1995. Constructing the public good: Social movements and cultural resources. *Social Problems* 42, 1 (1995), 124–144.
- [42] Wei Xu, Xin Liu, and Yihong Gong. 2003. Document clustering based on non-negative matrix factorization. In *Proceedings of the 26th annual international ACM SIGIR conference on Research and development in informaion retrieval*. ACM, 267–273.
- [43] Tegan Zimmerman. 2017. # Intersectionality: The Fourth Wave Feminist Twitter Community. *Atlantis: Critical Studies in Gender, Culture & Social Justice* 38, 1 (2017), 54–70.
- [44] Stephanie Zvan. 2014. But How Do You Know the MRAs Are Atheists? <https://the-orbit.net/almostdiamonds/2014/04/13/but-how-do-you-know-the-mras-are-atheists/>. Accessed: 2019-07-26.