Using Platform Signals for Distinguishing Discourses:
The Case of Men's Rights and Men's Liberation on Reddit

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Abstract

Reddit's men's rights community (`/r/MensRights`) has been criticized for the promotion of misogynistic language, toxic masculinity and discourses that reinforce alt-right ideologies. Conversely, the men's liberation (`/r/MensLib`) community integrates inclusive politics, intersectionality and masculinity within a broad umbrella of self-reflection that suggests toxic masculinity harms men as well as women.

We use machine learning text classifiers, keyword frequencies, and qualitative approaches first to distinguish these two subreddits, and second to interpret the differences ideologically rather than topically. We further integrate platform metadata (referred to as 'platform signals') to distinguish the subreddits. These signals help us understand how similar terms can be used to arrive at different interpretations of gender and discrimination. Where `/r/MensLib` tends to see masculinity as an adjective and women as peers, `/r/MensRights` views being a man as an essential quality, men as the target of discrimination, and women as sources of personalized grievances.

Keywords: computational critical discourse analysis, platform signals, Reddit, men's rights, men's issues

Introduction

In this paper, we show how platform signals—in this case, comment scores on Reddit—can be used to preserve some of the textual form that is lost when large amounts of user-generated text are aggregated and statistically analyzed. The concept of platform signals is drawn from the notion of platform effects by Malik and Pfeffer (2016) who define them as the ways that "the design and technical features of a given platform constrain, distort, and shape user behavior on that platform." We extend this concept to examine how platform metadata can be employed as signals to interpret users' behavior in the aggregate. We integrate these platform signals into machine learning text classification models in order to analyze the language characterizing two communities focused on men's issues: `/r/MensRights`, an anti-feminist group, and `/r/MensLib`, a pro-feminist group.

Reddit is a prominent and growing hub of internet masculinity discourses and "networked misogyny" (Marwick

and Caplan 2018; Massanari 2017). Chief among these is the men's rights movement (MRM), which, despite its pro-feminist origins in the 1960s and '70s (Messner 1998), has embraced the opinion that men have their rights infringed upon by out-group social movements oriented towards women, queer people, and people of color (Kimmel 1996, part IV). It has been rejuvenated by the rise of the social web, in communities which often overlap with alt-right, "neoreactionary," and conspiratorial ideation (Marwick and Lewis 2017, 14). Given its focus on defining threats from those other than typically heterosexual cis-gendered males, we consider it an example of exclusionary masculinity.

At the same time, inclusive masculinity discourses are developing online in reaction to the MRM. Short for "men's liberation," `/r/MensLib` describes itself as

> a community to explore and address men's issues in a positive and solutions-focused way. Through discussing the male gender role, providing mutual support, raising awareness on men's issues, and promoting efforts that address them, we hope to create active progress on issues men face, and to build a healthier, kinder, and more inclusive masculinity.[1]

Both groups share concerns about topics related to men's health and well-being, for example suicide rates among men and mental health. They also share concerns over custody law and parenting practices, albeit for different ideological reasons.

This research offers two primary contributions. In the first instance we are interested in identifying the linguistic features that distinguish the performance of anti-feminist masculinity from that of pro-feminist masculinity. This is not so much about the identification of topics, *per se*, but identifying ways of thinking both about gender and the relationship between gender and identity for men online. The second contribution is to show how the inclusion of platform signals can help to expand computational linguistic approaches towards interpretive and ideology-focused methods such as critical discourse analysis. As platform signals in this case concern voting from the silent majority, this work is an attempt to recover some of the wisdom of the crowd in a space that is often dominated by signals from the vocal minority. By integrating platform signals and focusing on ideological

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[1]http://www.reddit.com/r/MensLib/

expressions at scale, we show how interpretive approaches can extend, rather than compete with, contemporary statistical approaches to language.

We consider this work as "computational critical discourse analysis." CCDA (as opposed to Critical Discourse Analysis [CDA]) is a nascent field that is focused on understanding and articulating ideologies latent within large-scale text corpora.

To note, an ideology is a set of ideas used to make sense of the world (Althusser 2006). Typically, people do not articulate their ideologies explicitly. Instead, they enact discourses such as comments, speeches, and conversations. Thus, "[t]he goal of the analysis is to provide a detailed description, explanation, and critique of the textual strategies writers use to 'naturalize' discourses, that is, to make discourses appear to be commonsense, apolitical statements" (Riggins 1997, 2).

To illustrate how ideologies inform discourse we can look to two example quotes from the two subreddits. Both are relatively high-scoring; the /r/MensRights comment is in the 99th percentile of comments from that subreddit, while the /r/MensLib comment is in the 80th percentile of its subreddit's comments.[2] First is a quote from /r/MensRights that speaks to concerns about false rape accusations. "Because from what I have seen, most men don't have an emotional need to be the centre of attention. Many women do. Especially feminists, goes hand-in-hand with their manufactured victim image." Here we are not so interested in contesting the factual basis of this quote, even though we find the claims highly suspect. Instead, we are asking what ideologies would emerge that would make this quote appear commonsense or obvious. In this quote we see the poster assert that there are gender-based differences in personality, the poster accuses women of being out of control of their emotions and the poster castigates people who advocate feminism as manufacturing victimhood. While we cannot know precisely what the author was thinking, we can posit here that the author assumes that men and women are distinct with distinct personality types and that feminism is seen as an insincere set of ideas. The poster also implies that only women are feminists. We can see this clearly contrasted with a quote from /r/MensLib on reducing suicide rates: "what it means to be a woman has changed a lot, but what it means to be a man hasn't really changed quite as quickly and now men are kind of out of place." Like the previous quote, the poster here asserts that there are men's issues that should be considered more prominently than is currently the case. However, unlike the previous poster, this one implies that gender is an identity that can and should change over time.

These quotes were selected for their illustrative value here. They help us to understand potential avenues forward and were selected after the analyses were complete. However, they are not to be mistaken for the analysis. It is here where we seek to understand whether at the macro scale these two subreddits can be treated as distinct. As can be seen from the quotes, they tend to focus on similar topics.

To that end, it is not the topics in particular that we wish to identify. Rather, we wish to identify what is required to accept a given argument on that topic as being commonsense or at least worthy of being upvoted and promoted within the respective communities.

We show how comment scores on Reddit are both an essential organizing principle for the proliferation of content on the platform and also a means of distinguishing subreddits as distinct ideological communities. The distinctiveness of these communities is reflected in choice of words, but also crucially in the combinations of words, their co-occurrence and their attractiveness to the reader as evinced by positive voting signals. We note key ideological distinctions between /r/MensLib and /r/MensRights: Men's Lib as a movement views gender as a construct and masculinity as a potentially but not necessarily toxic practice. The MRM, by contrast, view men and women as distinct and essential categories of personhood with men as becoming increasingly threatened institutionally. Rightly or wrongly, the MRM have been implicated in the recent rise of the far right, incel culture and linked to violent acts such as the shootings by Elliot Rogers and Alek Minassian (Squirrel 2018). To differentiate violent and exclusionary masculine discourses from reflexive and inclusive ones requires more than simply identifying androcentric (male-centered) topics, but understanding the different ideologies used to interpret and legitimate these topics.

Literature Review and Research Questions

We first introduce critical discourse analysis and describe its application to modern large-scale corpora. We then discuss statistical methods in linguistics, particularly vector semantics. Finally, we introduce Reddit and the men's identity subreddits under inquiry.

Discourse analysis: critical and computational

Discourse analysis (DA) is a broad term encompassing numerous, overlapping approaches to analyzing situated linguistic and semiotic practices. DA is motivated by the simple observation that "any form of writing is considered to be a selection, an interpretation, and a dramatization of events" (Riggins 1997, 2). Far from "transparent," language does a great deal of "social and ideological 'work'. . . in producing, reproducing, or transforming social structures, relations and identities" (Fairclough 1992, 211). The goal of the discourse analyst is to deconstruct and illuminate the latent ideologies used to rationalize a discourse.

CDA is an excellent fulcrum for this study for three related reasons. 1) Unlike other DA methods such as conversation analysis (Schegloff 2007), CDA is oriented toward textual analysis. For newspaper articles, for example, it includes the structure of a news article when interpreting ideologies (Fairclough 1992, 194). For example, burying a quote at the bottom of an article or using quotation marks might serve to distance the quoted speaker from the writer's voice. In a comparable way, the decision to incorporate community-generated platform signals into discourse analysis extends CDA's attention to textual form. Comment scores work to

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[2]Scores are reported as percentiles because absolute scores scale with the size of the community.

organize comments, as well as reflect the process of community evaluation. 2) CDA already respects the utility of quantitative reasoning within an interpretive textual analysis. For example, it is convention to count the number of lines given to either pro- or anti- sides in a news article. 3) It provides an excellent framework for relating basic quantitative observations—such as simple counts of words dedicated to a given speaker—to critical, qualitative inferences about a text, and then proceeding from textual argumentation to argumentation about "macro" systems of power.

CDA's origins in the 1980s mean that it was designed for the analysis of "traditional" mass media forms such as newspapers and television segments. Its methods cannot exactly be scaled to a media environment such as Reddit, where ideologies coalesce over thousands or millions of very short documents. Thus, CDA must be operationalized into a form that can scale to such a corpus, and this is where computational critical discourse analysis becomes useful. For example, shifts in pronoun use might correlate with particular psychological states, but such a pattern might only emerge at scale (Campbell and Pennebaker 2003).

Still nascent, CCDA has yet to settle into a routinized form and currently represents a bevy of approaches. We use the term to mean the scaling-up and refining of the traditional quantitative elements of discourse analysis, suitable for discourses in large digital corpora. We draw inspiration from, for example, Papacharissi's work on affective publics on Twitter (Papacharissi 2016) and De Choudhury and Kiciman's work on the language of online mental health support (De Choudhury and Kiciman 2017). Although neither attaches the term CCDA to their work, both use statistical methods to guide textual interpretation by isolating important discursive elements within large social media corpora. We depart from the specifics of their methods but seek to retain their scalability, attention to platform signals, and qualitative connection to the text. To do so, we draw from contemporary vector semantic approaches to language analysis.

Statistical approaches to linguistics

In order to understand how language is used in processes of meaning-making—how words combine to constitute sociocultural processes such as telling a story, explaining a political agenda, or insulting an adversary (Duranti 2009)—an attention to the patterning of linguistic forms is required. However, certain patterns emerge only at certain scales. This is particularly true for sociocultural studies of online language, where social discourses are distributed over many short documents: tweets, Facebook comments, Reddit posts, and so on.

Since the 1990s, vector semantics has been used to capture semantic relationships between words at scale (Landauer and Dumais 1997; Mikolov et al. 2013; Pennington, Socher, and Manning 2014). Furthermore, vector semantics and derivative topic-modeling methods have been used to investigate linguistic differences between online communities, including subreddits (Chancellor, Hu, and De Choudhury 2018; Ammari, Schoenebeck, and Romero 2018). This study departs from earlier work by investigating discourse rather than semantics, despite otherwise drawing upon a rel-

atively similar toolkit. This means certain modifications of conventional vector semantic approaches are warranted, particularly with respect to interpretation of findings. Nevertheless, a primary method used in this study—text classification based on $TF - IDF$ vectors—is fundamentally indebted to vector semantics.

We draw further theoretical inspiration from what Eckert (2012) calls the "third wave of variation studies" in sociolinguistics, itself a statistically-oriented branch of linguistics. Whereas earlier variationist studies have been criticized for conceiving of identity categories as static and their relationship to language use as deterministic, the third wave shifted "from a view of variation as a reflection of social identities and categories" to a view "in which speakers place themselves in the social landscape through stylistic practice" (Eckert 2012, 93-94; Silverstein 2003). Thus, the question is not, "Which types of men use which linguistic features?" but "Which linguistic features do men use to convey which gender ideologies in a given context?" This subtle theoretical realignment grants a more active role to speakers. They do not simply reflect stable ideologies but help to construct and reconstruct them with every utterance. It is in this sense that contemporary theorists assert that we *perform* discourses rather than merely *reflect* them (Butler 1988).

An overview of Reddit

Founded in 2005, Reddit began at the margins of mainstream culture but has since become the world's sixth-busiest website, surpassed only by Google, YouTube, and Facebook in the United States. Billing itself as the "front page of the internet," Reddit is a content aggregation platform where users can create and participate in bulletin board-style communities called "subreddits" organized around themes. Massanari (2015, 6-7) enumerates several ways that Reddit distinguishes itself from similar platforms, including the lack of connection between online and offline personae (unlike Facebook), the lack of emphasis on a particular media format (unlike YouTube), its pseudo-anonymity (unlike 4chan), and its mostly decentralized curation (unlike blogs). Past work has demonstrated the efficacy of large-scale analysis on Reddit, especially when interested in the language of particular communities. For example De Choudhury and colleagues have demonstrated mental health can be understood from platform signals as well as text on Reddit (De Choudhury and Kiciman 2017; Tamersoy, Chau, and De Choudhury 2017), while Schrading et al. (2015) do similar work with domestic abuse narratives.

Two of Reddit's participatory mechanisms are integral to this study: commenting and voting. Other forms such as submitting links and direct messaging are beyond the scope of this work. Every content submission is adjoined by a comment section where users can reply to the submission (and reply to other replies). As Massanari (2015, 4-5) writes, "most of what makes Reddit an engaging place are the discussions around submitted content...Here is where the best (or worst) of Reddit is on display." All submissions and comments can be up– or downvoted by anyone logged into a user account. By default, all content is linearly ordered according to "karma," which is displayed visually and roughly corre-

sponds to score (*upvotes* − *downvotes*) divided by time, although users may also sort by newness, controversiality, or top posts within certain periods of time.

The voting mechanism is arguably Reddit's most pervasive mechanism of discerning content. On active subreddits the voting system becomes a dominant curatorial force determining what content will reach most people. This is the main theoretical justification for the centrality of comment scores in the analysis; score is both a numerical artifact of a participatory, ideological process, as well as a useful proxy for a comment's visibility.

Having introduced our statistical approach, its application to computational discourse analysis, and Reddit as a platform environment, the first research question emerges as:

> *RQ1: How can platform signals, in this case comment voting scores, be used to strengthen understandings of identity-based discourses through large-scale statistical methods?*

In the remainder of this section, we introduce the specific subreddits to be analyzed, along with the framework of gender studies used to interpret the analysis.

Gender performativity online: the manosphere, `/r/MensLib`, and `/r/MensRights`

Reddit is one of the most important internet hubs for discourses of contemporary masculine identities and "networked misogyny" (Marwick and Caplan 2018). This is due both to the predominance of a generally white, masculinist ethos characteristic of many online communities, as well as to the existence of numerous subreddits dedicated to men's rights and other masculine identity-based movements (Massanari 2017). A key platform used by masculine interest groups to congregate, these subreddits could be deemed part of the *manosphere*, a broad coalition of online masculinist groups united by strong anti-feminist positions (Ging 2017). This focus on gendered behavior manifested through emergent technologies ties this work to the field of feminist HCI (Bardzell 2010; Schlesinger, Edwards, and Grinter 2017). We sympathise with feminist HCI's overarching goals of greater fairness between genders, greater accessibility for women online and a critical view towards existing platforms, which we do not consider neutral by default. In fact, our very focus on platform signals is meant to illustrate how these technologies can naturalize and reinforce sometimes problematic discourses by design.

With over 210,000 subscribers as of March 2019, the `/r/MensRights` subreddit is certainly one of the MRM's most prominent online gathering points. It describes itself simply as "a place for those who wish to discuss men's rights and the ways said rights are infringed upon." In the subreddit's sidebar, which contains basic information about the community, the first link is to an article entitled on the differences between the MRM and the feminist movement (White 2011). It enumerates several ways in which feminism "endorses legal bigotry" while the MRM "seeks to end it," mostly related to topics like child support and custody, differential treatment concerning sexual assault and domestic violence, and false rape accusations.

At the same time, pro-feminist masculinity discourses are developing online in reaction to the MRM. These groups maintain a focus on issues that specifically affect men and masculinity, while grounding themselves in feminist principles. The `/r/MensLib` subreddit can be seen as such an example. Extending the introductory quote about a kinder healthier community, this community also sees itself as part of a broader network of identity communities rather than being threatened by such communities. From the subreddit sidebar, we read that `/r/MensLib` "recognize[s] that men's issues often intersect with race, sexual orientation and identity, disability, socioeconomic status, and other axes of identity, and encourage open discussion of these considerations. We consider ourselves a pro-feminist community."[3]

As O'Brien (1999) noted, online

> it is possible to observe how persons categorize self/other and structure interaction in the absence of embodied characteristics. Specifically in this case, 'gender as performance' can be theoretically and empirically separated from corporeal sex markers. Cyberspace provides a site for studying the viability and implications of constructionist theories that emphasize 'doing gender' as a social accomplishment. (78–79)

Through this lens, commenting on forums like `/r/MensRights` or `/r/MensLib` is interpreted as one way that contemporary men articulate their ideologies of gender. Differences in comment language, then, can be understood as constitutive of divergent masculinities. The second research question thus emerges as:

> *RQ2: What lexical features most strongly distinguish the discourse in `/r/MensLib` from that in `/r/MensRights`?*

Methods

This study proceeds in several steps. The first uses machine learning text classification models to determine whether word distributions in high-scoring `/r/MensLib` and `/r/MensRights` comments are easily distinguished from each other. We first do this with a random sample of comments from both subreddits. We then investigate whether weighting the sample by the comment score of the comment leads to an improvement in the model. We use resampling to get a distribution of results for each technique.

Under the assumption that there is a sufficient difference between `/r/MensLib` and `/r/MensRights` comments that can be found by a classifier, we proceed to examine which words are distinct between each group. Here is where discourse analysis might depart from topic modelling or other clustering based approaches. We are not seeking to create specific models of the n topics discussed in these groups and compare whether their topics differ. Rather, we wish to answer the question "how does the way the speaker discusses the topic make their claims appear self-evident?" People may use the same words and even similar combinations of words and come up with very different interpretations. As such, we will specifically be looking for differ-

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[3]http://www.reddit.com/r/MensLib/

ences in the use of gendered words and differences in what is associated with patterns in understandings of gender. For this, we use thresholded word frequency lists to evaluate which words are co-associated with which ideological, gendered space.

Between part-of-speech tagging and word co-occurrence we believe we have a foundation for understanding how gender is discussed at scale in these two differing contexts. That said, we believe that a richer picture of the differences are to be found through full text quotes. For that reason, we include many quotes concerning gender in our discussion section. We understand that these comments can, with considerable work, be recovered from Reddit.

Our University Ethics committee discussed our use of comments in the paper as part of our approved ethics review. Our goal here is to indicate how the comments typify discourses related to the topic at hand. We neither foreground nor personalize the commenters. We neither triangulate comments nor make claims about the specific politics of commenters beyond what is understood from the text in the data. We consider this reasonable and fair use of publicly available data.

Machine learning text classification with random and high-scoring comments

Data collection   The few quantitative studies modeling the qualities of successful Reddit comments are inconclusive as to whether word distributions statistically correlate with comment scores. Horne et al. (2017) conclude that lexical features predict high comment scores in certain subreddits but not in others, where factors like timeliness are more important. Interestingly, in a similar study of six subreddits, Jaech et al. (2015) found that lexical features and lexical "informativeness" weakened their model in only one subreddit: /r/AskMen, a Q&A subreddit where men are intended to be the respondents, with many questions related to masculinity in one way or another. In other words, lexical features were not shown to statistically relate to comment scores in /r/AskMen. If this study is to compare word distributions across high- and low-scoring comments related to men and masculinity, it must first be shown that meaningful differences exist between comments of different scores in these two subreddits.

Comments were acquired from a public dataset containing all Reddit comments through January 2018, hosted on Google's BigQuery by Jason Baumgartner. Every /r/MensRights and /r/MensLib comment meeting the following criteria was extracted, along with all available metadata:

- It is between 50 and 750 characters in length,

- It does not begin with a > sign (as this denotes text being quoted from an outside source),

- It was authored between 1 January 2016 and 31 December 2017.

The resulting dataset contains 677,866 comments and over 30 million words. The majority of comments are from /r/MensRights (91.7% of comments and 89.4%

of words). This asymmetry is due to /r/MensRights being a much larger and more popular community than /r/MensLib. However, the 56,469 /r/MensLib comments suffice for the specific computational methods chosen. Comment scores represent an amalgam of upvotes and downvotes. However, since Summer 2014, Reddit no longer allows comment downvote counts to be accessed via the API. Nevertheless, the amalgamated score suffices here due to the fact that scores are used as a proxy for visibility, and high-scoring comments will be highly visible regardless of the number of underlying downvotes.

Text processing   All text processing was conducted in Python. Raw comment strings are first tokenized, part-of-speech tagged, and lemmatized with the tag-lemmatize library (Tsuji 2017). By including syntactic information, lemmatizing algorithms can distinguish, for example, between a verbal participle used in an adjectival context (the sleeping child) rather than a verbal one (the child was sleeping). Stop words are removed, with the exception of personal pronouns, as pronoun use has been related to various psycho- and sociolinguistic phenomena (Campbell and Pennebaker 2003; Kacewicz et al. 2014) and is of direct theoretical interest here.

TF-IDF vectorization   A document-term matrix with individual comments as documents is used to generate a sparse matrix of term frequency-inverse document frequency ($TF - IDF$) vectors. Terms with high $TF - IDF$ values for a given document are generally the most descriptive of that document. If a word occurs many times in one comment but rarely in the rest of the corpus, it is probably useful for characterizing that comment; conversely, if a word occurs frequently in a comment but also occurs frequently in the corpus, it is probably less characteristic of that comment. The popular machine learning library scikit-learn (Pedregosa et al. 2011) is used for matrix generation and transformation.

After representing each document as a $TF - IDF$ vector, a trio of supervised machine learning classification models are trained to categorize unseen comments as either /r/MensRights or /r/MensLib. We use the following three algorithms via scikit-learn: a Linear Support Vector Classifier ($LSVC$), a Multinomial Naive Bayes (MNB) classifier, and a Logistic Regression (LR) classifier. All are commonly used in text classification (Genkin, Lewis, and Madigan 2007; Joachims 2002; Kibriya et al. 2004). Drawing from the initial dataset of 677,866 comments, models are separately trained and tested on two different corpora: 1) a random subsample of 50,000 comments; and 2) a weighted random subsample of 50,000 comments, with weights equal to the community-determined score of each comment. The 50,000 comments are equally divided between /r/MensRights and /r/MensLib. There are thus six possible corpus-classifier combinations, and the performance of each is cross-validated with a repeated stratified k-fold of $k = 10$ and 10 repeats.

The hypothesis in this exercise is that *the model classifies more accurately with the weighted corpus than with the random corpus*. Failing to reject this hypothesis provides ev-

idence that the communities promote content that is more lexically distinct from each other than average. This is a one-tailed hypothesis. Although the opposite might be true, whereby the weighted sampling of high scoring comments leads to lexicons that converge, anecdotal evidence (namely, the widely discussed belief among Redditors that repetitive content is regularly upvoted within a given subreddit) suggest that the reduction in difference is unlikely for these contrasting subreddits.

Feature selection and analysis The features that a model associates with one corpus or another can inform a more granular analysis. Namely, these features focus on words that are the most statistically characteristic of each subreddit. To do this, we employ the `feature_selection.chi2()` function from the `sklearn` library to isolate the ten most distinctive unigrams and bigrams using chi-squared statistics (Yang and Pedersen 1997).

Because the classifiers are dichotomous their top feature lists will be identical (i.e., a feature positively associated with one corpus will necessarily be negatively associated with the other corpus). Thus, we can examine differences between top and non-top comments within a subreddit as well as differences between subreddits. To do this, we return to the main corpora and split it into four groups: $MensRights - top$ comments, $MensRights - non - top$ comments, $MensLib - top$ comments, and $MensLib - non - top$ comments. A comment was in the top group here if its score is equal to or greater than the 95th percentile of comment scores within that subreddit. Once the comments have been partitioned, the exact distributions of the features over the four corpora will be examined to know which features are associated with which subreddit as well as the relative frequencies of the features in top versus non-top comments. These features will inform qualitative interpretation of words in representative comments.

Results

Model performance We begin by training six machine learning models to classify comments by subreddit with two different corpora (one from `/r/MensRights` and one from `/r/MensLib`). The first three classifiers work on 25,000 comments randomly sampled from each subreddit. The second three classifiers work on a sample weighted by comment scores. Figure 1 visualizes the performance of each model, measured by its $F1$ score (the harmonic mean of its precision and recall), with a lowercase w denoting performance with the weighted corpus. Each model performs between 2 and 3 percentage points better when classifying higher-scoring comments rather than random comments. A paired t-test confirms the significance of the disparities ($p < 10^9$ in each case).

Strongest features of the model Turning to the top features of the most accurate model (the logistic regression of comments sampled by vote score), a notable subset of words appear directly related to gender. That is, the following words were particularly helpful in distinguishing
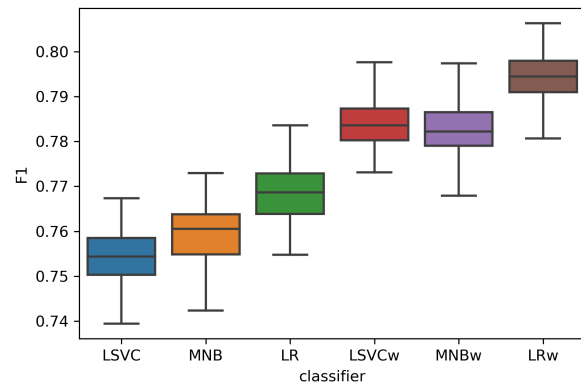

Figure 1: Box plots of the distribution of F1 (an accuracy score) for the unweighted and weighted samples from the two subreddits. The first three plots are the performance of the three classifiers (linear support vector classifier, multinomial naive Bayes, and logistic regression) using unweighted data. The second group of three uses the samples weighted by vote score.

`/r/MensRights` and `/r/MensLib`: *masculinity, masculine, she, her,* and *gender role*. In other words, the distribution of these words across subreddits is statistically useful in classifying comments as belonging to either `/r/MensLib` or `/r/MensRights`. We also examine *feminine* and *femininity* below. Due to the presence of *she* and *her* in the top features, an expanded list of personal pronouns is included as well. Figure 2 displays the frequencies of these words in each of the four partitions. One of the most interesting results from this analysis is that only two words occur more frequently in `/r/MensRights` than in `/r/MensLib`: *she* and *her*. Further, both occur even substantially more frequently in top `/r/MensRights` comments than in non-top `/r/MensRights` comments. The same is true for words occurring more frequently in `/r/MensLib`; every one occurs more frequently in top comments than in non-top comments. Additionally, whereas the word *woman* occurs at comparable rates in the two top comment corpora, the word *man* occurs far more frequently in top `/r/MensLib` comments than top `/r/MensRights` comments. Finally, despite occurring relatively infrequently compared with other keywords, the terms *masculine, masculinity, feminine,* and *femininity* show the greatest relative differences in usage between the two subreddits. *Masculine* occurs 10.8 times as frequently in `/r/MensLib` than `/r/MensRights`; *masculinity* at 7.9 times, *feminine* at 8.8 times, and *femininity* at 8.3 times as frequently. Among top comments only, these differences jump even further to 17.6, 11.2, 16.7, and 11.2, respectively.

Qualitative comparisons of top word lists The lists of the 1,000 most frequently used words in each subreddit's top comments only partially overlap. There are 220 words that only appear either in the MR_t list (or, by extension, the ML_t list) and 780 words in common. In Table 1, we selected 50 words from each pool of 220 distinct words to present here for interpretation. We understand there is some arbi-
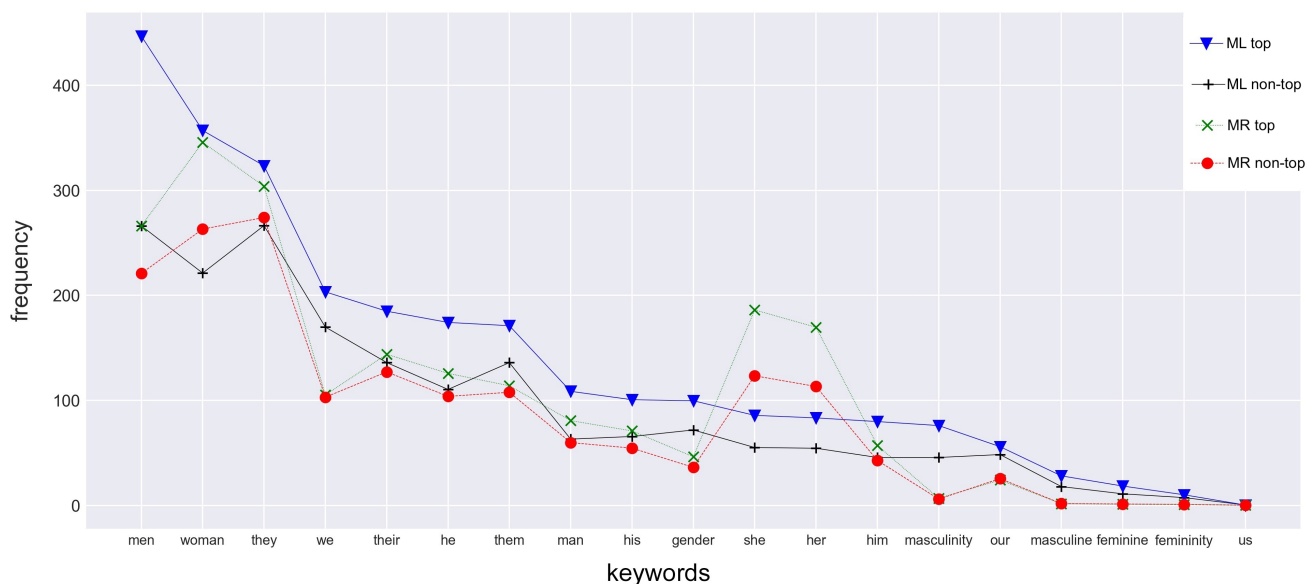
Figure 2: Distribution of the frequency of gender-specific words per 10,000 comments across the four partitions: /r/MensRights top and non-top comments and /r/MensLib top and non-top comments.

trariness to the selection of the 50 words present here. These are seen as guides for future work. To that end, this section is seen as an exploratory interpretive complement to the hypothesis-driven work above. In the table, we further bold words that are among the 1,000 most frequent words for the subreddit's top comments, but not for its non-top comments.

Certain broad but telling discursive patterns can be seen in each subreddit's unique words. Perhaps the most notable observation regarding unique words in MR_t is the presence of a wealth of concepts related to criminality, law and the justice system (*accusation, arrest, charge, criminal, convict, custody, divorce, evidence, guilty, harassment, illegal, innocent, jail, justice, lawsuit, lawyer, legal, murder, offender, sentence, trial*). Additionally, there are clusters related to the workplace and education (*career, college, education, employee, professor, science, university*), to misogynistic or pejorative language (*bitch, cunt, sjw, sjws*), to the politics of bodies and gender (*abortion, bathroom, pussy, vagina*), and to more abstract ideas of persecution (*discriminate, minority, misandry, punish, punishment, oppress, oppression*). A final word of interest is *anymore*—an adverb which modifies negative verb phrases in most dialects of English.

With respect to /r/MensLib, identity-oriented phrases appear far more common than words about legal institutions. This includes (*bi, bisexual, conservative, gendered, feminine, femininity, masculine, lgbt, queer, progressive, sexuality, racial, racism, trans, transition*). /r/MensLib also appears to focus on emotional states (*comfortable, emotion, emotionally, insecurity, pain, uncomfortable, vulnerable*), communication (*acknowledge, apologize, awareness, boundary, communication, empathy*), social role expectations (*expectation, reinforce, representation, shaming, socially, societal, stereotype, traditional, traditionally*), and

health and wellness (*harmful, helpful, therapist*). These 50 words do not necessarily dominate the comments: only 26.1% of top /r/MensRights comments contains at least one of the above unique /r/MensRights words, while 43.3% of top /r/MensLib comments contain at least one of its unique words.

Discussion

Investigating the use of platform signals

Focusing these results towards the first research question on platform signals, we can assert that the inclusion of these signals has improved our ability to distinguish the discourses in these two domains. By improving the accuracy of machine learning models, we affirmed that lexical differences between /r/MensLib and /r/MensRights comments are more pronounced in higher scoring comments. Further, the keyword frequency analysis demonstrated that distinct and topically-related keywords generally occur more frequently in top comments than non-top comments. In the context of computational social science, this strengthens the interpretability of the results; by privileging the comments that the community has deemed high-quality, richer and more nuanced results can be achieved with smaller corpora. Because of the inherent relationship between score and visibility due to Reddit's design, isolating high-scoring comments will isolate high-visibility comments as well.

We might expect that comments which are highly upvoted by members of a community are most representative of that community, and therefore most distinct from comments in ideologically divergent communities. However, given the lack of consensus in the literature about the relationship of lexical features to comment scores on Reddit, it was necessary to confirm that such a relationship exists

Table 1: Selected unique words from the set of the top 100 distinct words in the top comments of /r/MensRights and /r/MensLib. Bold words are among the thousand most frequent words in that subreddit's top comments, but not in its non-top comments.

Partition	Selected Unique Words
MR_t	abortion, accusation, accuse, accuser, anymore, arrest, **bathroom**, bitch, career, charge, college, criminal, **convict**, cunt, custody, **discriminate**, divorce, education, **employee**, evidence, guilty, harassment, illegal, innocent, jail, justice, **lawsuit**, lawyer, legal, minority, **misandry**, murder, **offender**, **oppress**, **oppression**, **professor**, proof, punish, punishment, **pussy**, responsible, science, sentence, sjw, sjws, statistic, threat, trial, university, **vagina**
ML_t	acknowledge, **apologize**, **awareness**, bi, **bisexual**, **boundary**, comfortable, communication, conservative, **creepy**, criticism, depression, emotion, emotionally, empathy, expectation, feminine, femininity, folk, gendered, harmful, helpful, **hormone**, **insecurity**, **incel**, **lgbt**, masculine, **misogynist**, pain, porn, progressive, **queer**, **racial**, racism, **reinforce**, **representation**, romantic, sexuality, **shaming**, socially, societal, stereotype, therapist, traditional, **traditionally**, trans, **transition**, uncomfortable, **unhealthy**, **vulnerable**

between these two subreddits. These results therefore justified the additional division of the original dataset into top and non-top comments. This approach further underscores that platform signals such as comment scores are useful for isolating representative and information-rich documents from large social media corpora. Rather than sampling comments based on an extrinsic measure–for example, pointwise mutual information (Recchia and Jones 2009)–or using the entire dataset, a focus on platform signals generated by the community ensure that sampling is representative of the norms of the subreddit's ideology.

The feature keyword frequency analysis revealed notable disparities in word usage between /r/MensRights and /r/MensLib, as well as between top and non-top comments in each subreddit. Among the strongest features of the model, five are immediately related to gender roles: *masculinity, masculine, she, her,* and *gender role.* That the terms *masculine* and *masculinity* would strongly differentiate between the language of two groups which are inherently interested in masculinity is one of the more surprising findings. Despite the fact that /r/MensRights users constantly discuss masculine roles, behaviors, and expectations, they use the terms with roughly 1/8 the frequency of /r/MensLib users. Similarly, /r/MensLib commenters use the term *men* more often than /r/MensRights commenters, also surprising given the androcentric nature of both groups. Figure 2 shows the same trend for the terms *feminine, femininity,* and *gender role.* On the other hand, it is equally surprising that /r/MensRights commenters use the terms *she* and *her* significantly more frequently than /r/MensLib commenters, given how common personal pronouns are. That /r/MensLib users are likely to frame their discourse in terms of masculine and feminine gender roles suggests a general tendency toward non-essentialist ideologies of gender. Where an essentialist ideology would start with the premise that men and women are essentially different, a non-essentialist ideology indicates that gender is at least partially culturally constructed on top of biological features. Thus, /r/MensLib commenters use language

which reflects the idea that individuals have the capacity to assume both masculine and feminine roles and qualities. As one /r/MensLib user writes, "[i]f we can succeed in changing the view of typically female coded traits as negative, it will make it easier for men to adopt them. Men expressing emotions without being seen as weak is the most obvious example" (ML). This does not mean that /r/MensLib commenters do not make reference to men and women; on the contrary, /r/MensLib commenters surpass /r/MensRights commenters in using the term *men* in both top and non-top comments. On the other hand, the *she/her* disparity reflects that /r/MensRights commenters are much more likely to discuss the actions of individual women. This trend is amplified in the top comment corpora, where the difference in usage between the subreddits is even greater.

Here the most notable case is the word *men.* Whereas the terms appears at equal rates in non-top /r/MensLib and top /r/MensRights comments, a large disparity exists between top /r/MensLib comments and non-top /r/MensRights comments. That top /r/MensLib comments use the word *men* much more frequently than every other corpus suggests that the community values and rewards discourses focused on male behavior. Conversely, top /r/MensRights comments use *men* less frequently than other /r/MensRights comments, reflecting that very successful /r/MensRights discourses are less likely to make reference to the actions of men. Each other word occurs more frequently in the top comment corpus than in the non-top comment corpus. In other words, lexical trends that distinguish the language of /r/MensLib commenters from the language of /r/MensRights commenters at large become stronger when sampling primarily from top comments.

Taken together, this underscores that /r/MensLib comments are characterized by non-essentialist language, and by a discourse style that devotes much more attention to men than /r/MensRights comments. Conversely, /r/MensRights' advanced use of *she* and *her* points

to an androcentric discourse which places more attention on the actions of women than of men, perhaps reflecting an us-versus-them mentality that is less marked in the `/r/MensLib` comments.

Investigating differences in discourse

Turning towards the second research question on the discourses themselves, we can see that these two domains share many lexical features yet talk about the same topic in identifiably different ways. `/r/MensLib` and `/r/MensRights` share concerns about inequality in primary and secondary school achievement, literacy, college admissions, criminal sentencing, suicide, lack of support networks, and poor mental health resources for men. Even `/r/MensLib` can be critical of "radical feminism." What distinguishes `/r/MensLib` comments from `/r/MensRights` comments on the same issues is the attribution of blame. This analysis suggests that the men's rights movement is more accurately described as an anti-feminist movement than a pro-men movement. The near-absence of the terms *masculine* and *masculinity*, lower rates of the term *men*, and elevated rates of *she* and *her* suggest that their discourse is generally more focused on women and feminists than men. This male-feminist antagonism reflects a destructive gender binarism and engenders a strain of zero-sum thinking. `/r/MensRights` has co-opted the language of equality movements centered around women and minorities, couching their struggle within the "exterior signs" of social justice: discrimination, rights, equality, and so on. This is evinced by the astonishing frequencies of "institutional" terms related to the court system, law enforcement, and education system, many of which are unique not only to the `/r/MensRights` corpus but specifically to the top-comment corpus. As one `/r/MensRights` asks: "So is it illegal to disagree with a woman already or not yet?" (MR).

Quotes with these terms reveal this bias is direct and angry. Common topics include custody: "Yeah, woman automatically make better parents because they have a vagina and therefore get custody? That's institutionalized bullshit right there" (MR); anti-male bias in universities:

> I tested this one semester, had my wife write my paper since we were in the same class. She makes an A on her paper and the same writing style with my name on it makes a C. Fuck that professor (MR);

anti-male bias in public policy:

> Despite the fact that the criminal justice system is objectively biased against men who are more likely to be arrested, charged convicted and given longer sentences than women, Feminists argue that that that this is not institutional sexism despite feminist groups lobbying governments to treat women differently to men in the criminal justice system (MR);

and using decontextualized news stories as a frame to justify anger against women: "I hope he gets settled for life and sue the shit of that school, and the female student should be punished because fuck that bitch" (MR).

The unique presence of *anymore* perhaps suggests a tendency to frequently compare the social and political land-

scapes of today with previous times: "Because over the last 10k years men have been working and dying to create a world where women are safe. We did it. Women are safe now and they know it. Men don't matter anymore" (MR).

Whereas the word *anymore* reflects one pattern of indexing the past in `/r/MensRights`, *traditional* and *traditionally* could be said to accomplish a similar role in `/r/MensLib`. For example, as one top `/r/MensLib` comment says,

> [f]or generations, people have been pushing back against restrictions on femininity; there's still a ways to go yet, but society is much more open now to women acting outside 'traditional' femininity. There has not been as strong a corresponding push for men, so many gendered expectations for men are just as strong as they were 100 years ago (ML).

Echoing men's rights discourse, this comment is premised on a disparity in how "society" treats men and women. Yet here, the commenter does not treat feminism as the problem, nor does it suggest that society is systematically punishing men. Rather, it acknowledges one of the successes of the feminist movement in (partially) reconfiguring societal expectations of femininity, and expresses the desire for masculine roles to be similarly transformed.

The misogynistic vindictiveness which so clearly characterizes `/r/MensRights` discourse is mostly absent from `/r/MensLib`. When it arises, it is often pushed back on:

> There's a lot to unpack in this comment but I can't help but feel like you're disregarding the concept of toxic masculinity, while exhibiting some traits of it yourself here now. Try to re-read OP's [original poster's] comment without taking it as a personal attack (ML).

Rather than narrativizing the crisis of modern masculinity as a product of the society's feminization, `/r/MensLib` commenters tend to address these issues introspectively. They want to share in the liberation from stringent gender roles that the feminist movement has partially accomplished for women. They also generally recognize that women have not wholly been freed from gender roles, and that intersectionality is more complex than the superficial notions of "equality" and "equity" that dominate `/r/MensRights` (and much public discourse about power asymmetries). In other words, the purely oppositional relationship between men and women/feminists in `/r/MensRights` is replaced by a worldview in which men and women are both victims of patriarchal gender roles, and equally deserve to define themselves beyond the confines of those expectations:

> No, toxic masculinity doesn't blame men. 'Masculinity' doesn't mean 'men', it means *male gender roles*, i.e. the very social forces you talk about. That's why it's called rape *culture*, a social force that warps our view of sex, consent and violence. Feminism is focused on women, yes, because they're the oppressed minority. They're well aware that men also suffer from the social order that oppresses women (ML).

Indeed, this worldview is shared by the American Psychological Association, whose recent guidelines for psycholog-

ical practice with men and boys assert that the toxic masculinity of rigid unequal gender roles is psychologically harmful and is a cause of rather than a reaction to gender disparities (American Psychological Association 2018).

In summation, the discursive field of `/r/MensRights` positions men as acted upon by a feminized society, whereas `/r/MensLib` is more focused on actions men can take to liberate themselves from the expectations of traditional masculine roles. This is directly reflected in perhaps the most interesting finding from this study: that `/r/MensRights` discourse devotes very little attention to masculinity as a concept, to the extent that the term is among the statistically strongest predictors in the machine learning models. This simple observation captures both the essentialist binarism of the MRM—where gender is understood in terms of a man-woman opposition, rather than a masculine-feminine spectrum—as well as the MRM's outward-facing anger and lack of introspection.

Conclusion

Limitations and further work

A consequence of relying on platform signals is that exact methods will not be easily transferable between platforms. What can be transferred, however, is the approach to understanding how discourses are expressed at scale with the inclusion of signals from the oft-silent majority. Researchers might want to compare this approach to other parallel subreddits or perhaps to the voting mechanisms on other social media such as Facebook and YouTube. Where past work has asked what it takes to get highly upvoted content, here we ask how can such votes be used to interpret the prevalent ideologies that emerge among participants.

In addition to expanding this study, there is room to expand the present methods. For example, different methods of separating top- and non-top comments could be tested, such as selecting the top comments within each thread rather than across the whole subreddit. We have interest in resolving false negatives here. That is, while we are confident that all comments in the top-comment corpora represent popular comments, there are likely "non-top" comments which contain similar argumentation to top comments and may have even been top had they been written earlier in the discussion (Lampe and Resnick 2004). In a similar vein, there is merit to looking at the language in the lowest-scoring comments as a distinct category, rather than aggregating them with everything else below the 95th percentile of scores. This may help us indicate what sort of language is policed or considered out of bounds. Comparisons of word usage frequencies could be performed with different weighting systems, such as log-likelihood ratios, to see if and how results would change (Berger, Pietra, and Pietra 1996). Finally, these methods could be improved by attending to the different posts to which comments respond; comments in a Q&A-style thread are likely to be structurally different than comments to news articles, for example (Gonzalez-Bailon, Kaltenbrunner, and Banchs 2010).

Important social movements will continue to take place within textually mediated, online platforms like Reddit.

These platforms do not merely reflect the world, but increasingly serve as constitutive spaces for contemporary ideological processes. Such ideologies might concern gender, race or any variety of social issues. Platforms therefore offer a wealth of textual data from which we might seek to understand modern social movements. Equally importantly, they also offer a wealth of *con*textual signals useful to help social science researchers understand not just what is said, but what is seen and what ideological work is achieved by the text.

Acknowledgements

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