EXTREMEBB: Enabling Large-Scale Research into Extremism, the Manosphere and Their Correlation by Online Forum Data

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ABSTRACT
Online extremism is a growing and pernicious problem, and increasingly linked to real-world violence. We introduce a new resource to help research and understand it: EXTREMEBB is a structured textual dataset containing nearly 44M posts made by more than 300K registered members on 12 different online extremist forums, enabling both qualitative and quantitative large-scale analyses of historical trends going back two decades. It enables us to trace the evolution of different strands of extremist ideology; to measure levels of toxicity while exploring and developing the tools to do so better; to track the relationships between online subcultures and external political movements such as MAGA (the importance of which was seen in the attack on the US Capitol in January 2021); and to explore links with misogyny and violence, including radicalisation and recruitment. To illustrate a few potential uses, we apply statistical and data-mining techniques to analyse the online extremist landscape in a variety of ways, from posting patterns through topic modelling to toxicity and the membership overlap across different communities. A picture emerges of communities working as support networks, with complex discussions over a wide variety of topics. The discussions of many topics show a level of disagreement which challenges the perception of homogeneity among these groups. These two features of mutual support and a wide range of attitudes lead us to suggest a more nuanced policy approach than simply shutting down these websites. Censorship might remove the support that lonely and troubled individuals are receiving, and fuel paranoid perceptions that the world is against them, though this must be balanced with other benefits of de-platforming. EXTREMEBB can help develop a better understanding of these sub-cultures which may lead to more effective interventions; it also opens up the prospect of research to develop better tools to identify hate speech, and to monitor the effectiveness of any interventions that are undertaken.

KEYWORDS
online extremism, far-right extremism, manosphere, misogyny, incel, gendered violence, political violence, online forums, EXTREMEBB

1 INTRODUCTION
There is no widely accepted definition of extremism: policy documents tend to be vague, over-inclusive and inconsistent [23]. However, there is an intuitive sense of the term: communities united by ideologies outside the mainstream which are damaging to individuals and societies alike. It comes in many forms, whether religious, ethnic, racial, nationalist, political, or environmental, and many groups of extremists throughout history have turned to violence to achieve their goals. Although this phenomenon is by no means new, the Internet has transformed the ways in which propaganda is spread, communities are formed and individuals radicalised. Online platforms have proliferated over the past few decades, including self-governed (and sometimes end-to-end encrypted) chat-based servers such as Discord and Telegram [49]; social networks such as Twitter, Gab and Parler; video-sharing platforms such as Youtube and Facebook [29, 36, 45], and a variety of online forums [6]. These platforms routinely contain toxic content expressing misogyny, political hostility, racism and frustration; they have facilitated recruitment, socialisation and mobilisation of extremist ideologies [24].

This threatens the security of people in both online and offline spaces, as a number of terror attacks, mass killings, and other forms of violence have been associated with the far right, including the Wisconsin Sikh temple shooting in 2012, the riots in Charlottesville, Virginia in 2017, and recently, the storming of the Capitol on January 2021. Far-right extremism has persisted in the United States since the nineteenth century, but is now organised largely online [34]. Other mass murders have been linked with frustrated men promoting toxic masculinity along with antifeminism, including the Isla Vista killings in 2014, the Toronto Van attack in 2018, the Hanau shootings in early 2020, and most recently, the Plymouth shooting in the UK in August 2021.

Such attacks have drawn the attention of the policy community to the correlation of terrorism with misogynistic and far-right extremism. Hudson et. al found a statistically significant relationship between the physical security of women and the security of states; authoritarian patriarchal attitudes undermine government in multiple ways [19]. The relationship between terrorism and misogyny has also been explored in the recent work of Smith [48], who documents how many violent extremists, whether far-right or Islamist, have a history of abusing women – often in their own families – before committing acts of violence against strangers. Most of the work so far on the link between misogyny and violence has been qualitative; the main quantitative work has been by Hudson et al on the Womanstats database [9], which tracks women’s status with various social and economic metrics for 176 countries. We lack quantitative measurements at finer granularity.

Online forums are a valuable and powerful resource for research, as they record not only discussions but also social interactions, enabling us to observe relationships between users. The content is stored in a hierarchy from boards (or sub-forums) down to threads then individual posts. As forums typically let users hide their identity behind pseudonyms, they enable more extreme, toxic and aggressive content. Forums are also more resilient as they often use self-governed (and sometimes end-to-end encrypted) chat-based platforms have proliferated over the past few decades, including self-governed (and sometimes end-to-end encrypted) chat-based servers such as Discord and Telegram [49]; social networks such as Twitter, Gab and Parler; video-sharing platforms such as Youtube and Facebook [29, 36, 45], and a variety of online forums [6]. These platforms routinely contain toxic content expressing misogyny, political hostility, racism and frustration; they have facilitated recruitment, socialisation and mobilisation of extremist ideologies [24].

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the kind of extremist material blocked by providers such as Facebook and Twitter. However, as forums do not usually provide APIs to fetch data directly, the collection process is a major obstacle for non-technical scholars who need to deal with complicated scraping techniques before actually getting on with their research.

We have therefore collected ExtremeBB, a large-scale dataset of over 44M posts on various online web forums promoting misogyny and far-right extremism, which helps researchers start work on online extremism immediately rather than spending months (or even years) gathering data. We review the background of the manosphere and far-right extremism in §2, then describe the forums included in ExtremeBB in §3, before presenting insights and statistics about these communities in §4. We then examine the correlation between the manosphere and extremism more generally in §5 before sketching the landscape observed from the data and discussing potential uses of ExtremeBB for future research in §6.

2 BACKGROUND & RELATED WORK

Far-right Extremism. Most of our data set originates from the United States, a country where far-right extremism is complex, partly due to historical grassroots organisations, various cultural, religious, and racial undertones to its movements [30, 31]. The Know-Nothing movement [31, 34] has pre-civil war roots, and was characterised by xenophobia against Irish and German Catholic immigrants [31, 34]. In 1865 the Ku Klux Klan (KKK) was founded to target “African Americans, Northerners, and Southern collaborators” in the post-Civil war era [6, 30, 34] The US far right has since became more diverse; several ideologies are intertwined, with at least eight sub-groups: 1) Christian identity, 2) holocaust denial, 3) Ku Klux Klan, 4) Militia, 5) neo-Nazi, 6) Posse Comitatus, 7) Skinhead, and 8) White Nationalist [6, 15, 31].

The Internet enables such groups to reach large and diverse audiences, and to do so with some anonymity [35]. This has empowered extremists in various ways ranging from recruitment to information sharing [6, 15, 16]. Online platforms have allowed such groups to develop a sense of community by sharing values, norms, and identities. Data from social networking services and extremist forums have already been used to examine their temporal evolution [22], the QAnon movement [37], the expression of ideological sentiments [17] and how new users encounter and learn sexist ideology online [40].

Manosphere. The manosphere is a heterogeneous group consisting of men promoting certain forms of masculinity, who often express strong hostility towards women and feminism. Historically, a surplus of men over women is associated with instability and violence, particularly against women [12]. Men who have difficulty finding female partners, even in countries with gender balance in the population as a whole, are able to associate online, whether to offer mutual support or to nurse grievances [36]. Masculine ideals rooted in misogyny are now promoted in various forums, chat servers and social media platforms. There is a broad range of subcultures, including involuntary celibates (incels), men going their own way (MGTOW), pick-up artists (PUA) and men’s rights activists (MRA) [25].

The manosphere overlaps with far-right groups in membership, with growing evidence of their members repeatedly associated with online harassment, real-life violence and terror attacks [14]. A number of researchers have been exploring manosphere-related forums, Reddit, and Youtube data to examine the characteristics and the evolution of the manosphere [14, 44], studying incels [36] and online hatred of women [21].

Potential Correlations. Online communities of men facing sexual frustration pose a threat of online radicalisation [36]. A correlation between the manosphere and the far right has been observed both in practice and by qualitative study; several scholars have described the relationship as symbiotic and close [13, 48]. However, it still escapes scrutiny by policymakers [42] and there seems to be little or no attempt to systematically confirm and explore this correlation. To date, the only quantitative work that we are aware of is by Mamié et al., whose analysis of Reddit and YouTube comments reveals a large overlap of users between the manosphere and the far-right [29]; while Ribeiro et al. analyse online radicalisation and quantitatively confirm the migration to more extreme Youtube channels of alt-lite extremists [45]. Baele et al. also recently analysed the violence inherent in the worldview of Incels [3].

3 THE EXTREMEBB DATASET

Our team has collected material on cybercrime forums for many years, developing CAPTCHA solvers, scrapers and analysis tools. Since 2019 we have also collected extremist material, and have now compiled ExtremeBB, a structured dataset of (currently) 12 extremist forums going back two decades from August 2001 to the end of September 2021, chosen for their far-right or manosphere content, and are expanding collection to other forms of extremism too. ExtremeBB supports both qualitative and quantitative analysis, offering a rich longitudinal resource to enable large-scale research into the manosphere, far-right ideologies, and their correlation.

3.1 Overview

Our initial exploration of extremist forums led us to observe strong links between misogyny and various forms of violent extremism. We therefore set out to collect data from forums satisfying five criteria: (1) publicly accessible, (2) currently alive, (3) with manosphere or far-right content, (4) an active platform and (5) at least 100K posts. We also scrape new but fast-growing forums which we anticipate will become prominent. For example, Lolcow was created in April 2021, but has been growing quickly. ExtremeBB is being actively expanded with more forums including smaller ones like Looks Theory, Chimpout, Christogenea, Creativity Alliance, and legacy ones such as White Nations and Iron Volk which have been suspended, but part of whose content is still available through digital archives. We are also starting to collect Islamist material. ExtremeBB forums are mainly in English, but we also plan to add more forums in other languages, which will no doubt yield very different results due to specific cultural and political contexts.

Categorisation. We categorise ExtremeBB forums based on their self-definition and analyse each category separately. Far-right extremism currently consists of the White SUPREMACY category (the belief in the superiority of lighter-skinned people, or that the white race deserves to dominate other races). The manosphere data falls
were very vibrant in the past, but now seem to be less active than whose members conduct targeted online attacks on individuals, Artistry.

As forums do not provide APIs to fetch content directly, we use a web scraper to collect the data. To avoid missing content, the scraper persistently stores execution states at every single run, enabling incremental crawling if unexpected incidents happen e.g., network errors, sites going down, or servers being under maintenance. EXTREMEBB is collected on a regular basis, sometimes in real time, and thus offers timely data on the development of extremist ideologies across the web. We are aware that memes and images are important and common forms of communication on forums, but our ethical safeguards do not allow automatic download of non-textual material as it may contain illegal images. The dataset thus contains textual data only. Some forums in our dataset have fewer posts than the statistics shown on their homepage as (1) our data collection started in 2019, and older content might have been removed or hidden (2) content posted then removed between crawls may be.

### Data in Brief
To the best of our knowledge, EXTREMEBB is the largest unified structured dataset of online extremist forums with nearly 44M posts made by more than 300M active members in around 2.7M discussion threads (see details in Table 1). We do not fetch images and videos as they may contain illegal material; thus a few percent of collected posts are empty. The average proportion of these across all forums is low, with most under 6%; only INCELSIS has over 10%. The largest and longest-running forum, with around 10M posts, is STORMFRONT, which was launched in 1996, but whose data is only available since 2001. At the time of writing, the smallest forum is LOLCOW, started in April 2021, and currently with less than 28,000 posts, though it is growing rapidly. The second most recent, yet fastest growing, forum looksmax was created less than 3 years ago, but accounts for a huge number of posts. Far-right forums were very vibrant in the past, but now seem to be less active than the younger manosphere forums. In general, larger communities are more active, but we observe members on the smaller far-right forum VANGUARD NEWS NETWORK posting nearly 200 posts on average which is far more than STORMFRONT.

### 3.2 Data Collection, Sharing and Ethics
As forums do not provide APIs to fetch content directly, we use a web scraper to collect the data. To avoid missing content, the scraper persistently stores execution states at every single run, enabling incremental crawling if unexpected incidents happen e.g., network errors, sites going down, or servers being under maintenance. EXTREMEBB is collected on a regular basis, sometimes in real time, and thus offers timely data on the development of extremist ideologies across the web. We are aware that memes and images are important and common forms of communication on forums, but our ethical safeguards do not allow automatic download of non-textual material as it may contain illegal images. The dataset thus contains textual data only. Some forums in our dataset have fewer posts than the statistics shown on their homepage as (1) our data collection started in 2019, and older content might have been removed or hidden (2) content posted then removed between crawls may be missed, and (3) access to some sub-forums may be restricted.

### Data Sharing
One of our key goals is making our data accessible to other researchers, especially social scientists who may lack the technical skills or time to collect data themselves. Another goal is reproducibility, so that research findings can be tested and built on (the data scrapers and scripts used for analyses in this paper are therefore available upon request). Our data is collected on publicly accessible forums, where the posts are widely available for everyone. Due to privacy and other risks posed by malicious actors, such as deanonymisation and individual targeting, the dataset is made available for academics only upon signing a license agreement to prevent misuse, to ensure that all research is ethical and to keep us informed of publications and results.

### Ethical Considerations
Our ethics committee has approved the collection of EXTREMEBB and the license agreement by which we make it available to other researchers. For useful analysis, it is necessary to outline the characteristics of forums including the discussion theme, creation date, the volume of posts and members, which makes identifying these forums trivial, particularly as they are publicly available and accessible by anyone. We therefore use

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<table>
<thead>
<tr>
<th>Category</th>
<th>Forum Name</th>
<th>Abbr.</th>
<th>Members</th>
<th>Boards</th>
<th>Threads</th>
<th>Posts (% Empty)</th>
<th>Av. Posts</th>
<th>Data Period</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>White Supremacy</strong></td>
<td>STORMFRONT</td>
<td>ST</td>
<td>132,991</td>
<td>152</td>
<td>754,174</td>
<td>10,231,751 (2.56%)</td>
<td>76.94</td>
<td>2001/08 - 2021/09</td>
</tr>
<tr>
<td><strong>Inceldom</strong></td>
<td>INCELSIS</td>
<td>II</td>
<td>9,497</td>
<td>6</td>
<td>298,867</td>
<td>6,759,703 (11.54%)</td>
<td>711.77</td>
<td>2017/11 - 2021/09</td>
</tr>
<tr>
<td><strong>Lookism</strong></td>
<td>LOOKISM</td>
<td>LK</td>
<td>16,079</td>
<td>10</td>
<td>742,840</td>
<td>7,082,915 (8.67%)</td>
<td>440.51</td>
<td>2015/06 - 2021/09</td>
</tr>
<tr>
<td><strong>Pickup Artistry</strong></td>
<td>ROOSHI V</td>
<td>RV</td>
<td>12,227</td>
<td>32</td>
<td>35,086</td>
<td>1,509,855 (4.11%)</td>
<td>123.49</td>
<td>2008/08 - 2021/09</td>
</tr>
<tr>
<td><strong>Men’s Movement</strong></td>
<td>MGO</td>
<td>MG</td>
<td>3,870</td>
<td>18</td>
<td>55,093</td>
<td>853,286 (2.02%)</td>
<td>220.49</td>
<td>2014/07 - 2021/05</td>
</tr>
<tr>
<td><strong>Trolling &amp; Doxxing</strong></td>
<td>KIWI FARMS</td>
<td>KF</td>
<td>47,973</td>
<td>47</td>
<td>36,452</td>
<td>7,834,300 (3.25%)</td>
<td>163.31</td>
<td>2013/01 - 2021/09</td>
</tr>
<tr>
<td><strong>6 Categories</strong></td>
<td>12 Forums</td>
<td></td>
<td>308,743</td>
<td>467</td>
<td>2,731,031</td>
<td>43,972,088 (5.83%)</td>
<td>142.42</td>
<td>2001/08 - 2021/09</td>
</tr>
</tbody>
</table>

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Table 1: The category (separated by grey lines), abbreviation, number of active members (having at least one post), boards, threads, posts, proportion of empty posts, average posts per member, and collection period of forums included in EXTREMEBB.
Figure 1: Timeline, volume of posts and posting users over time. Coloured labels indicate starting years while corresponding bars show the number of posts. The starting time is when we observe the first post, rather than when the forum was created. Forum abbreviations are shown in Table 1.

Forum names, as hiding them does not provide additional anonymisation and does not make the forums unidentifiable. Even though members can and do use pseudonyms, some individual posters – and individuals named in posts – are identifiable. There is therefore a risk of harm, and anonymisation is impractical. We thus focus on protecting individuals against harms that could follow from analysis: only aggregated results may be published so that attackers cannot infer individual information. Our work thus accords with the British Society of Criminology’s Statement on Ethics [7].

4 ONLINE EXTREMIST COMMUNITIES

This section describes the general characteristics of the extremist communities included in ExtremeBB. We only consider active members, defined as those who have contributed at least one post.

4.1 Members and Posting Volume

White Supremacy data in ExtremeBB started at the beginning of the 21st century, and Pickup Artistry communities five years later. Trolling & Doxxing and Men’s Movement began in 2013-2014, with Lookism and Inceldom forums following a few years later (see Figure 1; separated figures are shown in the Appendix). Far-right communities grew rapidly to peak in 2009; thereafter, the forums collected in ExtremeBB began to decline, and are now less active than younger forums related to men’s issues. Looksmax, Lookism, Incelsis and Kiwi Farms are now the fastest-growing forums, rising to a pandemic peak in 2020 when posting volume was twice that in 2019 (with 10M posts). Forum members did not increase by the same proportion; presumably users were more active due to the boredom caused by the COVID-19 lockdowns. The posting volume over the first 9 months of 2021 is around 63% of the 2020 peak.

4.2 Content Toxicity

Measuring the levels of toxicity in different subcultures helps understand those communities better and track the most toxic topic. Existing efforts to detect hate speech include work on tweets by Davidson et al. [11] and Google’s Perspective [41], which both use machine learning to build predictive models for hate speech detection. Google’s approach works for longer text and marks the toxicity level of content, thus fits our data better; posts are typically longer than tweets, and we aim to measure toxicity level rather than solely detect hate speech. Google provides an API to access their service free of charge. Used by prior works on comment toxicity [37, 38], the API is available in multiple languages, and detects eight speech categories: toxicity, severe toxicity, identity attack, insult, profanity, threat, sexually explicit, and flirtation. Given a comment, the API returns the probability of it being toxic (between 0 and 1). We discarded 5.83% empty posts, which may contain images that were ignored by our scraper. Posts exceeding the API limit of 20 KB (around 0.05%, containing a lot of spam) were also ignored.

Overall, the distribution density of most types (except flirtation) is highly left-skewed, suggesting, perhaps surprisingly, a rather low median level of toxicity (see Figure 2). Yet there is a nontrivial subset of extremely toxic comments. These posts are mostly in Trolling & Doxxing, Inceldom and Lookism, represented by the abnormal protrusions at the end of the distribution density (see the light yellow circles on top of the whiskers). Severe toxicity reaches its maximum at around 1.0 for only Trolling & Doxxing, Inceldom and Lookism, again suggesting these categories are more toxic than others. Insult posts are common across most categories, but appears to be most toxic in White Supremacy, Men’s Movement and Trolling & Doxxing (see white dashed ovals). Identity attack and threat are common on White Supremacy only (red dashed ovals); we found in later analysis that ethnicity and racism are commonly discussed on White Supremacy forums. On the other hand, there is little sexually explicit material and profanity in White Supremacy compared with other categories. Flirtation has the least-skewed distribution density compared to others, and its toxicity level seems to be higher, with the average and mean at around 0.4 and all values greater than 0.1. We observe an especially high proportion of flirtation among Inceldom, Lookism and Pickup Artistry (noted as light blue dashed ovals); those forums are united by extreme misogynist ideology, plus an interest in ways to enhance physical appearance and to game girls to bed.

4.3 Discussion Topics

The simple but naive way to identify discussion topics is to look directly for keywords in posts (see visualisations in the Appendix). A better but more complex approach is topic modelling. We use a probabilistic generative model called Latent Dirichlet Allocation (LDA) [5] to uncover hidden topics in the forum discussion. The intuitive idea behind LDA is that the underlying hidden patterns within the corpus can be learned by observing the co-occurrence probability of terms, thus forming ‘topics’. We consider all posts within each category of our forums as a corpus, and see each post as a document containing an unordered set of keywords. The LDA estimation process requires us to decide the number of topics beforehand – one of the most important hyperparameters affecting model quality. To decide the optimal number, we trained several models spanning 10 to 100 topics with incremental steps of 10, then...
selected the best based on coherence scores [32] (see the Appendix). Our experiment uses the LDA implementation from Mallet [28].

While latent topics can be quantitatively inferred from text by LDA, that is just the beginning of the process. Interpreting the results requires reading representative documents from each topic to check the computational analysis, understand the content of each topic, and assess the range of documents within it. To understand the context of discussion, for each representative document we also look at the thread it belongs to. It is not guaranteed that all hidden topics are well interpreted, as they are sometimes meaningless. For example in Lookism one turned out to consist of posts which happened to include words to do with size, but with no semantic coherence. In such cases, the keywords are often irrelevant, too general, or do not reflect a legitimate theme. After manually distinguishing genuine topics from false clusters, we select the top ten most prominent topics for further interpretation, based on their popularity estimated over all documents. For each of these topics, we read through a sample of 50 representative posts. We selected posts with the highest probability of being clustered into the topic, then mixed in a diverse range of shorter and lower-probability posts to make sure we captured a good picture. In total, we read through 3000 posts among 6 categories.

**White Supremacy.** Our dataset includes Stormfront, the largest and longest-running online gathering place for racist realists, ide- alists, white supremacists, racists, antisemites, and far-right extremists [6]. Some of its users have been involved in serious crime, and the site is associated with a number of terrorist atrocities. The other major, but smaller, forum Vanguard News Network is also well-known for its antisemitic and white supremacist content.

The overarching ideology, occurring across all topics, is therefore “race”. One type of discourse focused on racial stereotypes and identities, including pro-White support (2nd topic), racial stereotypes related to slavery in the United States (3rd), racial stereotypes in criminal contexts (5th), and the racial status of elites, particularly Jews (10th). The attribution of blame to Zionists and powerful elites was common in discussions on the unsustainability of debt-based financial systems (1st). Some other examples within this type of discourse include: 1) claims of poor treatment of slaves by Black slave owners compared to White owners in history; 2) statistics about the racial composition of cities, emphasising crime by Black and Hispanic individuals; 3) claims of racial differences in language skills and intelligence. Another type of discourse focused on the survival of the White race. More specifically, there is a belief that White women are the key to the survival of the race, so should not engage in interracial relationships. Members see interracial relationships and marriages (4th) and the promotion of multiculturalism and diversity (9th) as threats. The two outliers were cooking & recipes (7th), and guns & firearms (8th), where discussions were broad and centred around personal favorites and opinions.

**Inceldom.** Incels blame their inability to have sexual relationships with women either on feminism or “female nature”. They exhibit a paranoid worldview about society, which they see as governed by the few at the expense of the majority of men. ExtremeBB includes the largest and most active forum at present, Incelsis, and the smaller but still considerable Incelsnet. The range of the top 10 topics in our modelling produced shows just how wide-ranging and diverse incel discussions are: people may join for “incel ideology” but the discussions often have no incel content whatsoever. There is a broader preoccupation with human society with “race” coming top, “finance and economy” second, “politics” fourth and “society” sixth. Attitudes within these topics also vary hugely: it is impossible to generalise about incel attitudes to race or politics. The topic “society” is where the most general discussions of incel ideology are found, in theories of how globalisation, capitalism and feminism have led to men becoming victims. Other topics exhibit more typical manosphere content such as physical size (3rd), health and fitness (5th), sexual politics (7th), facial features (8th), social interactions (9th) and intelligence. There, incels typically share personal stories and support each other, as well as discussing general incel theories. Key themes cluster around what men and women find attractive and the asymmetry in these desires: incels believe that women only find one type of man attractive, the alpha male or Chad – high-status but above all good-looking. There is therefore an imbalance of power in dating.

**Lookism.** Lookism refers to techniques to enhance men’s physical attractiveness to women, and has clear overlaps with other parts of the manosphere including incels. Techniques are diverse. For example, whitemaxxing is where persons of colour use skin-lightening products and even surgery in an attempt to look more white, showing a possible overlap with racism. Such attitudes are entangled with a misogynistic perception that women are superficial and mostly attracted to men by personal appearance. As a result, Lookism users are considered extreme, with a strong relationship with Inceldom subcultures. We focus on two prominent forums: Lookism, active since 2015 and Lookismax, started in 2018 but is growing rapidly, outpacing Lookism in both the number of posts and users.

Most of the topics in the Lookism forums have two main elements: advice on hair care, skin care, gym regimes and diet, and generic pseudo-scientific analyses of physical attributes. As with
incel ideology, the most common topic discussed in the LOOKISM forums is race, but once more with a surprising range of attitudes. Many are openly racist, in a white supremacy framework, some drawing on early anthropological views of race and reflecting attitudes in the WHITE SUPREMACY category. These discussions are mostly about the relative attractiveness of different races, and perceptions of female attitudes to men of different races i.e. the content is still mostly within “lookism” concerns. After race comes the topic “hair and skin care”, with many and detailed beauty regimes, then “eyemaxxing”, involving assessments of relative attractiveness and what can be done (surgery is discussed a lot), and topics repeated in facial appearance (7th). Further topics with specific advice are diet (4th), hormones (8th) – which includes advice on hormone treatment, and gyms and fitness (10th). More generic, ideological topics include genetics and ethnicity, including discussion of historical migration patterns and the resulting phenotypes seen round the world, particularly in America (one post argued ethnic differences using average household income for different American backgrounds down to categories as small as “Swedish” and “Palestinian”).

Pickup Artistry. Another core part of manosphere is Pickup Artistry – an online community of men offering advice and training to pick up, date, and have sex with girls. The most popular forum dedicated to Christian men, Roosh V, was created by Daryush Valizadeh, a former pickup artist and well-known public figure within the incel subculture. Although “game” was initially the primary goal on Roosh V, in May 2019, he posted an announcement to stop discussion around abuse, including cheating on women. Another major forum created 2 years before is Pickup Artist; it is less active than Roosh V, but more exclusively dedicated to PUA topics.

Qualitative analysis shows a large difference between the two forums, emphasising the importance of thorough qualitative work to validate computational findings. Roosh V is deeply political (as with incel communities, there is a wide variety of political views) while this interest is absent from Pickup Artist: 99.75% of posts labelled “politics” are from Roosh V. These posts are heavy on global conspiracies, usually with antisemitic elements, and have a preoccupation with Marxism. The topic of elections is similarly skewed to Roosh V (future analyses will separate out Roosh V from Pickup Artist for these reasons). However, topic modelling using combined data can give us a first approximation to the overlap in concerns with other parts of the manosphere. As with LOOKISM forums, there are two main strands: specific advice, and general, overarching theories, the latter using pseudo-evolutionary frameworks with principles that some members adhere to (a “pseudo-ideology”, in the sense that the principles do not amount to an explanatory world-view but rather a guide to how to behave). This follows a long self-help tradition in dating advice, predating the Internet, which includes “classic” books by “master” PUs covering a range of approaches to dating and therefore do not always agree with each other; these disagreements form part of the discussions on PUA sites. The most popular topic, “contact methods” involves detailed theory, instruction and advice for individuals in both forums for making contact with women and progressing through a date to the holy grail of sexual intercourse. Both forums spend lots of time discussing meta issues e.g., how reliable different PUA theories are.

Men’s Movement. This social movement aims for complete separation of men’s lives from female lives, protecting and preserving men’s sovereignty, and exhibiting similar antifeminist, misogynistic and toxic-masculine ideals as other parts of the manosphere. The most well-known forum is MEN GOING THEIR OWN WAY, which has been active since 2014. Started just 5 months before this forum, an alternative, GOING YOUR OWN WAY, is five times smaller. These forums do not allow women to join, and adopt strict access control mechanisms upon registration to avoid their participation: all users joining GOING YOUR OWN WAY must be manually approved by admins or moderators, and are then asked to complete a compelling introduction before actually getting in and being eligible to post.

Across the top ten popular topics, the discourse is dominated by gender. One aspect is gender stereotypes, where topics related to hobbies such as motor vehicles (4th) or lifestyle (7th) point to gender as an explanation for behaviour (e.g., women’s reluctance to drive aggressively). This is more prominent in the top two popular topics, financial and economic systems (1st) and politics (2nd). Even when discussions are general, such as the tax system and credit system, gender dynamics are included. For example, with one post, the writer speculated that only 1-2% of women are in debt because of a man, while 80% of men are in debt because of a woman. A second aspect of the discourse revolves around the negative impacts of feminism; many blame men’s challenges on women no longer acting in a “feminine” manner. In the 6th topic on MGTOW (“Advice and Awakening Stories”), several members report happy and positive outcomes when they decided to be indifferent to women and to reprogram their reactions to the biological instincts of sex. The macro-level benefits of MGTOW to humanity are discussed in the 10th topic, which draws on sociology, biology, and evolution to show the problems caused by feminism and how MGTOW would “correct” current gender dynamics and women’s behaviour.

Trolling & Doxxing. Inspired from cyberbullying, online stalk- ing and harassment techniques, Kiwi Farms is probably the largest Internet community for trolling and doxxing and has facilitated several harassment campaigns. It began with the history of monitoring an autistic individual, and is now a forum dedicated to the concept of “lolcows” (people and groups whose eccentric or foolish behavior can be “milked” for amusement and laughs, despite them not trying to be funny). They engage in organised trolling, cyberstalking, harassment and doxxing, with the targets often being individuals perceived as autistic or transgender. A recently established forum is LOLCOW. Despite starting in April 2021 and having a limited number of posts and members at present, it is fast-growing, with many members migrating from Kiwi FARMS. Although these forums discuss techniques rather than ideology, let alone an extremist ideology, the techniques can be – and mostly are – used in the service of an ideology, often linked to abuse and harassment campaigns against women, making them a useful resource for understanding the manosphere. Ideologies inherent in these campaigns are apparent if the posts are carefully read: attackers choose targets based on particular world views, for example autistic people or women.

The ten most popular topics reflect a diverse discourse. There are general pop-culture discussions, on gaming (1st), movies (9th), and recipe sharing (4th), but the remaining categories are detailed discussions on trolling and doxxing. The categories are organised...
trained by the Reuters corpus [46]. We decide that a username is rare if the highest probability observed among all segmented word sequences is not greater than 1%. Among around 12,051 overlapped users, we find 83.6% of them are rare.

Third, we require that the user’s postings on the two forums are correlated in time. To evaluate the dissimilarity of posting patterns of a user over two forums \( f_i \) and \( f_j \), we first calculate the posting hour distribution of \( f_i \) over \( f_j \) by normalising the number of their posts on each hour \( h \) (of 24 hours) to probability distributions, for example \( P_i(h) = \sum P_i(h) = 1 \). We then compute the Kullback-Leibler Divergence (KL-Divergence) from \( P_i \) to \( P_j \) by:

\[
KL(P_i \| P_j) = \sum_{h \in H} P_i(h) \log(P_i(h)/P_j(h)).
\]

As the KL-divergence is not symmetrical, we consider the average taken by \( D(P_i, P_j) = (KL(P_i \| P_j)+KL(P_j \| P_i))/2 \), as the final dissimilarity between \( P_i \) and \( P_j \). The two distributions are identical if and only if \( D(P_i, P_j) = 0 \), however it is unlikely to achieve in practice. Thus, a threshold 1.0 is set to distinguish \( P_i \) and \( P_j \), i.e. if \( D(P_i, P_j) \leq 1.0 \), we suggest \( P_i \) and \( P_j \) are likely the same.

A major limitation of cross-forum analysis is that it is hard to validate overlaps in the absence of ground-truth knowledge [8]. While our three constraints reduce the proportion of incorrect overlaps (false negatives), they increase the rate of missed overlaps (false positives). Ultimately, we can only provide a lower-bound estimate, rather than collate all cross-forum users. While individuals can and do make mistakes in operational security, linking distinct forum handles at scale is impractical, and possibly unethical.

Overlapping Proportion. Table 2 shows the overlapping proportion of users across forums measured by our heuristic. The overlaps at \((i, j)\) and \((j, i)\) are identical, but \(p(i, j) \neq p(j, i)\) as the measured proportion also depends on the member volume. There is a clear correlation between forums within a category; for example, 11% of users on LOOKISM also registered on LOOKMAX and likewise, 5% of users on LOOKISM are also active on LOOKMAX, suggesting members join multiple forums with related themes. The same pattern holds for INCELDOM, but with smaller proportions. For PICKUP

<table>
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</tbody>
</table>

Table 2: User overlap across forums. \( p(i, j) \) shows the proportion of users on forum \( i \) also registers on forum \( j \). Grids separate categories. Gray boxes indicate overlap’s strength.

5 EXPLORING THE CORRELATION

Our database enables researchers to explore potential correlations between the far right and the manosphere using both quantitative and qualitative approaches. We present here an initial view.

5.1 Membership Overlap

People often participate in multiple online communities and shared membership can help overlapping communities to survive and grow [37]. But how can we measure overlap across forums whose members can adopt multiple pseudonyms? While stylometry – the measurement of writing style – can help identify authorship [1, 2, 56], it is challenging in our context as to train a classifier, we need ground-truth knowledge about cross-forum membership, which is absent. Here, we estimate a lower-bound overlap using a heuristic.

Heuristic Strategy. To predict if a user is on two different forums, we first require that a same pseudonym must be used. Some online platforms (e.g., Reddit) automatically suggest usernames or ‘handles’ for users upon registration, but forums generally do not; members can freely pick their own preferred handle, provided it is not already in use. Prior work has shown that many people use a small number of handles [26, 39] and most participants in a survey prefer using a single username for multiple online accounts to reduce the effort of remembering different ones [27]. Common handles can be used to collate, trace and profile them [39, 52], but despite the privacy risk, participants in anonymous online forums have a strong incentive to establish legitimacy and reputation, as it is one of the few ways to build up trust [33]. While prior work has used Jaro-Winkler distance [55] to estimate the similarity between two usernames as the first constraint [8], ours is stricter as we require them to be identical. The overlap is therefore likely to be underestimated as we do not collate users who adopt different handles on different forums.

Second, we require that the shared handle must be rare enough, as rare usernames (e.g., jo3km) are more likely to be used by a single person, while common ones (e.g., glory) are more likely to belong to multiple real individuals [27]. A common metric is using n-gram probabilities; each username is segmented into a word sequence, then its n-gram probability is estimated by a language model [26]
Artistry, about 6% of Roosh V members also registered on Pickup Artist, while only around 1% of Pickup Artist are also on Roosh V. This is unsurprising as Pickup Artist has six times the number of members of Roosh V. Notably, 8% of users on Going Your Own Way are active on Men Going Their Own Way and 11% of users on Vanguard News Network are also members on Stormfront, suggesting a strong connection between forums within these categories. Exceptionally, a very high proportion of members on Lollcow (25%) are on Kiwi Farms, suggesting a migration of users from Kiwi Farms to the new forum Lollcow.

Across categories, there is a close relationship between Inceldom and Lookism, suggesting a strong correlation between misogyny and anxiety about physical appearance. Men’s Movement also relates to Pickup Artistry with 3-6% of overlapping users, showing a close connection between misogyny, antifeminism and pickup artistry. A notable observation from our initial study is that all of the manosphere forums share a considerable proportion of members with Stormfront (the largest far-right forum) at around 3-7%, with Men’s Movement highest at 7%. This supports a correlation between misogyny and far-right extremism. This overlap is less than in prior works [44, 45] and [29]; they use data from platforms (YouTube and Reddit) where users can be collated exactly by their usernames. The difference may give us a rough measure of the extent to which we underestimate the overlap by not even attempting to collate users who adopt different names across forums.

5.2 Topic Overlap

Besides the membership overlap, a qualitative analysis of the top 10 most prominent topics observed in 4.3 for each category also indicates overlap in themes between the manosphere and far-right discourse. The first theme is race; this is foundational to White Supremacy, but topic modelling shows that it is also widespread on manosphere forums, although attitudes vary hugely by forum. One factor missed in our initial topic modelling, but picked up by extensively reading sampled posts, is the scale of antisemitic theories and tropes throughout the forums. We suspect this is because of the range of terms used to refer to Jews, forming a sort of “dog whistle dictionary”: Zionist, Marxist, cultural Marxist, global elites, Israel/J, Hebrew and Judaic, as well as other more offensive words. Goy and goyim also signal posts that are likely to be antisemitic. This is an interesting topic for research in NLP research methods and AI in general; how do we deal with issues which have a range of key words and allusions? The recent Facebook disclosures reveal that the company’s own AI toxic content filters fail to identify even a quarter of the hate speech on the platform [47].

The second theme is gender. The manosphere narrative is that when women no longer act in accordance with traditional gender roles and ‘nature’, they create a range of problems for men. The far-right discourse views white women as essential for the survival of the race and demands that they refrain from interracial relationships. Despite the difference in narrative, the two discourses share the same undertone: women are the root cause of social issues and challenges. The narratives focus on either protecting women as resources or, in more extreme cases, using the threat of violence to manipulate their behavior. Misogyny is ever-present: even when respectful views are raised, for example in PUA forums arguing for full consent by the woman, the replies posted will often contain at least one misogynistic view.

6 DISCUSSION AND CONCLUSION

This analysis of ExtremeBB reveals the subtle complexities of these overlapping extremist communities. The forums in our dataset are clearly heterogeneous in terms of both issues under discussion (as elicited by topic modelling) and attitudes within topics (as clear from manual reading of posts). But despite this overriding impression of diverse communities, there are unifying features, notably misogyny, and to a lesser extent antisemitism. All our findings have profound implications for policy and future research.

For these sub-cultures, these forums, despite physical distance and lack of face-to-face interactions, foster the formation of social relationships [6]. Like offline communities, they offer shared common values, norms, and a sense of identity. This is evident in the presence of awakening stories across all categories of forums, where members share their realisation and journeys to new-found identities with non-mainstream norms and values. Their common features include not only racist and misogynistic ideologies but also paranoid theories of the world that often tip into conspiracy.

Although real-world violence has been linked to online forums, we find little evidence for violence in many of the forums themselves: it exists, but not as a main theme. Research into extremism shows that the drivers of radicalisation cluster around feelings of humiliation, marginalisation and grievance [54]. As these communities strengthen the feelings of grievance while lessening loneliness, their role in radicalisation is not straightforward. For some individuals, motivation towards violence will be increased by online activity (Anders Breivik). For others, the solace found in mutual support, lessening the shame and loneliness, could act as a brake; losing the community might drive more desperate behaviour.

All these features demand a nuanced policy approach. Shutting down forums will remove the mutual support that socially alienated people draw from their communities and simultaneously feed into their paranoid worldview, sometimes increase signals linked with toxicity and radicalisation [18]. We can observe the effects of this within our dataset: when Reddit banned r/incels in November 2017, Incelsis and Incelsnet were established and grew rapidly. Simply taking down websites will not work to lessen the spread of extreme ideologies in the longer term – unless done on a scale unacceptable in societies under the rule of law. Policymakers should thus adopt a combination of approaches: observing discussions, intervening with psycho-social support, and occasionally removing the most extreme and unlawful content [24]. As a bonus, monitoring forum discussions can provide near real-time measurement of the effects of interventions on each community (this technique has already proved valuable in the fight against cybercrime [10]).

Our dataset also shows changed patterns of use during lockdowns; most obviously, a clear spike in posting. The initial lockdown in 2020 intensified hate speech on a board dedicated to Coronavirus on Stormfront; its short-lived nature was mirrored in our cybercrime collections, and suggests it may be more due to changes in routine activities of frequent posters (i.e. increased free time under lockdown) as a reaction to the pandemic (which intensified in the US across the summer). We will be monitoring how hate
speech and discussion topics evolve over time, especially during subsequent periods of lockdown. Within the manosphere, not only posting quantity but also the types of discussions changed during lockdown, reflecting the change in concerns in everyday life.

We offer ExtremeBB to the research community to test and extend our findings, and to monitor developments in extremist communities in real time, which would shed light not only on the spread of ideologies but also the results of interventions undertaken against them. We hope that this resource will enable computer scientists and social scientists to work effectively together to tackle extremism online and in the real world.

ACKNOWLEDGMENTS

We are grateful to Alice Hutchings, Ben Collier, Sergio Pastrana and our colleagues at the Cambridge Cybercrime Centre for their valuable feedback and insightful comments on the early draft of this paper. This work was supported by the Engineering and Physical Sciences Research Council.

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APPENDIX

Data Pre-processing Pipeline

As forum posts contain a lot of noise (e.g., punctuation, redundant spaces, typos), before further analysis, raw data is normalised by the following preprocessing pipeline: (1) removing email addresses and URLs; (2) removing stop-words, not just in English, but from 23 languages supported by NLTK [4] and other popular ones from RanksNL, [43] giving a total of 32 languages that we filter; (3) removing domain-specific words not related to manosphere and extremism, and common neutral words such as ‘thing’, ‘set’, ‘create’, and ‘make’; (4) removing unused HTML tags such as “[img]” and “[size]”; (5) converting words to a unified root by lemmatisation, for example, on gaming forums [20] and underground cybercrime markets [50]. Our dataset reveals that extremist communities are no different (see Figure 5). Among all categories, WHITE SUPREMACY is the most centralised, where STORMFRONT has only 7.4% of members making around 90% of posts, compared to 11.3% for VANGUARD NEWS NETWORK. In contrast, TROLLING & DOXXING exhibit relatively wide gaps of centralisation between its forums, with INCELNET more centralised than INCELSID and ROOSI V is far more condensed than PICKUP ARTIST. In contrast, the centralisation of LOOKISM forums seem to be identical with around 17% of members accounting for 90% of posts, both for LOOKISM and LOOKMAX. Men’s MOVEMENT forums are also centralised with around 10.9% active members of MEN GOING THEIR OWN WAY (17.9% for GOING YOUR OWN WAY) making 90% of posts. On MEN GOING THEIR OWN WAY, we observed a single, suspicious user seeming to make a massive contribution of around 18% of the total, which is exceptional.

Optimal Number of Topics of Trained Models

Different topic models yield different numbers of topics that optimises the models’ coherence. The coherence score ranges between 0 and 1, where a higher score signifies greater coherence. This depends on many factors, from the dataset itself, to the model hyperparameters and even the random seed. The coherence scores of our models range from around 0.6 to 0.75 (see Table 3), which is very good in practice, showing a strong correlation between words within each topic (a score higher than 0.8 is unlikely to happen). Given the same data, the coherence score can be improved by tweaking some model hyperparameters (e.g., α, β, and the number of topics); however, it is computationally expensive (in fact impossible) to try every case compared to the benefit it yields. In practice, gradually increasing the number of topics (e.g., from 10 to 100 in our experiments) leads to the coherence increasing moderately, peaking, then decreasing. Unless the optimal coherence is so low that we have to tune hyperparameters, we can take the peak coherence to guide the choice of number of topics. Note that, as the coherence score heavily depends on the dataset itself, there is no standard judgement that can cover all cases.

Table 3: The number of topics that yields optimal models and the corresponding coherence scores in our experiments

<table>
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<th>Forum Category</th>
<th>Optimal N-topics</th>
<th>Coherence Score</th>
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</tr>
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</tr>
<tr>
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<td>80</td>
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</tr>
<tr>
<td>MEN’S MOVEMENT</td>
<td>30</td>
<td>0.639688</td>
</tr>
</tbody>
</table>

Forum Centralisation

Communities often grow around a small number of key actors [53]. Such actors are often associated with a large proportion of content, for example, on gaming forums [20] and underground cybercrime markets [50]. Our dataset reveals that extremist communities are no different (see Figure 5). Among all categories, WHITE SUPREMACY is the most centralised, where STORMFRONT has only 7.4% of members making around 90% of posts, compared to 11.3% for VANGUARD NEWS NETWORK. In contrast, TROLLING & DOXXING & PICKUP ARTIST seem to be the least centralised, as KIWI FARMS needs 16.7%, LOCCOW requires 28.8%, ROOSI V needs 14.5% and PICKUP ARTIST needs 28.8% of key members to provide 90% of content in each case. INCELDOM, PICKUP ARTISTRY and TROLLING & DOXXING exhibit relatively wide gaps of centralisation between its forums, with INCELSID more centralised than INCELSID and ROOSI V is far more condensed than PICKUP ARTIST. In contrast, the centralisation of LOOKISM forums seem to be identical with around 17% of members accounting for 90% of posts, both for LOOKISM and LOOKMAX. Men’s MOVEMENT forums are also centralised with around 10.9% active members of MEN GOING THEIR OWN WAY (17.9% for GOING YOUR OWN WAY) making 90% of posts. On MEN GOING THEIR OWN WAY, we observed a single, suspicious user seeming to make a massive contribution of around 18% of the total, which is exceptional.
Closer scrutiny revealed that this handle did not belong to an individual, but a group of members who shared it and who are thus anonymised behind it.