From Laughter to Inequality: Annotated Dataset for Misogyny Detection in Tamil and Malayalam Memes

Rahul Ponnusamy[1], Kathiravan Pannerselvam[2],
Saranya Rajiakodi[2], Prasanna Kumar Kumaresan[1], Sajeetha Thavareesan[3],
Bhuvaneswari Sivagnanam[2],Anshid K.A[4], Susminu S Kumar[5],
Paul Buitelaar[1], Bharathi Raja Chakravarthi[1]
[1]Data Science Institute, University of Galway, Ireland
[2]Department of Computer Science, Central University of Tamil Nadu, India
[3]Department of Computing, Eastern University, Sri Lanka
[4]WMO Imam Gazzali Arts and Science College, Kerala, India
[5] Revemax International pvt.ltd, Bangalore, India
{R.Ponnusamy1, P.Kumaresan1, paul.buitelaar, bharathi.raja}@universityofgalway.ie,
{kathiravan.pa, bhuvisiva24, anshidka2017, susminuskumar1323}@gmail.com,
saranya@acad.cutn.ac.in, sajeethas@esn.ac.lk

Abstract

In this digital era, memes have become a prevalent online expression, humor, sarcasm, and social commentary. However, beneath their surface lies concerning issues such as the propagation of misogyny, gender-based bias, and harmful stereotypes. To overcome these issues, we introduced MDMD (Misogyny Detection Meme Dataset) in this paper. This article focuses on creating an annotated dataset with detailed annotation guidelines to delve into online misogyny within the Tamil and Malayalam-speaking communities. Through analyzing memes, we uncover the intricate world of gender bias and stereotypes in these communities, shedding light on their manifestations and impact. This dataset, along with its comprehensive annotation guidelines, is a valuable resource for understanding the prevalence, origins, and manifestations of misogyny in various contexts, aiding researchers, policymakers, and organizations in developing effective strategies to combat gender-based discrimination and promote equality and inclusivity. It enables a deeper understanding of the issue and provides insights that can inform strategies for cultivating a more equitable and secure online environment. This work represents a crucial step in raising awareness and addressing gender-based discrimination in the digital space.

Keywords: Misogyny identification, Meme classification, Multimodal dataset, Dravidian language, Social media post analysis, Computational social science

1. Introduction

In the digital age, the proliferation of internet culture and social media has given rise to a multitude of ways in which ideas, ideologies, and prejudices are circulated and immortalized (Chakravarthi et al., 2024). One intimidating manifestation is the wide frequency of misogyny, which has set up a new form of internet memes (Suryawanshi et al., 2020b; Weaving et al., 2023). Misogyny memes are a discomforting and pervasive expression of gender-based discrimination that has the implicit to support harmful stereotypes and normalize prejudiced attitudes toward women (Singh et al., 2023). The phenomenon of hatred is also expanding in line with this, as social media users frequently post derogatory content toward various targets and minorities unintentionally (Badjatiya et al., 2017; Kumaresan et al., 2023). Women are one of the more specifically targeted communities (Kocoń et al., 2021).

The need to address a multimodal issue is highlighted by the fact that hateful content toward women can be expressed not just via text but also through visual and/or audio sources or their combination (Singhal et al., 2022). Memes, which are images characterized by graphical content with an overlaying text introduced a posteriori, are one of the most common types of multimodal material that is hostile to women (U Hegde et al., 2021). Several approaches, such as Natural Language Processing (NLP) and Machine Learning (ML), have been presented in the state of the art for tackling the problem of automatic misogyny identification by applying text-based models. To the best of our knowledge, there is no multimodal dataset, especially in low-resourced languages such as Tamil or Malayalam, for developing methods that could detect misogyny in multimodal contents (Pamungkas et al., 2020). In this study, we presented the Misogyny Detection Meme Dataset (MDMD)

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[0]**Warning:** Due to the nature of this task, the data (memes) may be offensive content, but it is purely for demonstrative purposes. Please keep in mind that these materials are used solely for illustrative purposes and do not reflect the views of the authors or their affiliated institutions in any way.

and explored the development of this standardized multimodal dataset. As far as we know, this is the first multimodal dataset for detecting misogynous memes in the Tamil and Malayalam languages.

2. Related Work

In recent research, Ramamoorthy et al. (2022) introduced a pioneering approach to meme analysis. The authors meticulously provided gold-standard data for sentiment analysis, emotion classification, and intensity of emotion, offering a comprehensive understanding of meme content. They also presented baseline models, including a text-only model utilizing LSTM and a multimodal model combining ResNet-50 (He et al., 2016) and BERT (Devlin et al., 2018). The results demonstrated the potential of incorporating text and images for improved performance across meme analysis tasks. While the study acknowledged the preliminary nature of their models, it underscores the promise of multimodal approaches in meme analysis.

Suryawanshi et al. (2023) introduced a comprehensive framework to focus on image-with-text (IWT) memes, often called "troll memes." This framework presents a three-level taxonomy to understand the impact of trolling in domain-specific opinion manipulation. At the first level, it classifies memes as either troll or not-troll. The second level assesses whether the meme has the intent to manipulate opinions. On the third level, once opinion manipulation is detected, it categorizes the realm in which it happens, be it politics, products, or other areas. The authors have enriched the Memotion dataset (Sharma et al., 2020) by annotating it with the defined classes. The result is the TrollsWithOpinion dataset, containing 8,881 IWT memes in English, which is made available as an open-source resource on GitHub [1]. Experimental analysis, using both machine learning and state-of-the-art deep learning techniques, reveals that while models perform well on the first two levels of the taxonomy, challenges arise when classifying memes on the third level, highlighting the complexity of this task. These challenges include nuanced contextual understanding, subtle visual cues, and the integration of textual and visual elements in memes, all contributing to the difficulty of accurately identifying misogyny in multimodal content.

Hossain et al. (2022a) introduces a pioneering multimodal dataset, "MemoSen" for the Bengali language. This comprehensive dataset comprises a collection of 4,368 memes, each meticulously annotated with one of three sentiment labels: positive, negative, or neutral. A comprehensive annotation guideline is provided alongside the dataset to facilitate and encourage further resource development in this domain. Furthermore, this research endeavor involves extensive experiments conducted on the MemoSen dataset. These experiments encompass creating and evaluating twelve unimodal models, including visual and textual approaches, and ten multimodal models combining both image and text modalities. These experiments aim to explore and compare the effectiveness of various unimodal (visual and textual) and multimodal (combining both image and text) approaches in meme sentiment classification.

A benchmark meme dataset for the automatic detection of misogyny was created by Gasparini et al. (2022) using 800 memes that were collected from online sources, transcriptions for each meme, and analyzed by three experts and a crowdsourcing platform. They gathered memes from sites like Facebook, Twitter, Instagram, and Reddit, as well as by consulting websites that specialize in meme gathering and creation. With search terms like body shaming, stereotyping, objectification, and violence, the author gathered memes. Additionally, they looked at sexist talks at political and public gatherings and browsed hashtags like #girl, #girlfriend, and #women. Memes that are not misogynistic are manually downloaded from the same websites. Misogynistic, hostile, and ironic categories were used in the annotations. All of the memes have manual transcriptions. They obtained agreements of 100% for 800 memes from three experts, 100% for 554 memes, and an average confidence of 67% for the remaining 246 memes in their sample.

Rasheed et al. (2020) conducted a notable study focused on the influence of trolls and memes in shaping public opinion, with a specific emphasis on the 'Koodathayi Murder Case.' This infamous case involved a series of murders committed by Jolly Joseph in Koodathayi, Kerala, India, between 2002 and 2016 (Masih, 2019). Their research delved into the prominence of trolls and memes within the social media landscape, their role in streamlining the coverage of the case, and their portrayal of women. The study aimed to provide a comprehensive understanding of how digital content, particularly humour-infused trolls and memes, impacts public perceptions of criminal acts. Furthermore, the authors explored how memes might oversimplify serious crimes and analyzed the correlation between information curation in troll pages and memes and the audience's response. This research significantly contributes to our comprehension of the influence

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[1] https://github.com/sharduls007/TrollOpinionMemes

Figure 1: Sample meme with English translation of transcription and labels from Tamil dataset

of memes on public opinion in the context of criminal events.

The study addresses the increasing prevalence of offensive and abusive behavior on social media (Hossain et al., 2022b). The researchers focused on memes as a means of conveying information and proposed a weighted ensemble-based technique for classifying memes based on visual, textual, and multimodal features. They evaluate their approach using the MultiOFF (Suryawanshi et al., 2020a) and TamilMemes (Suryawanshi et al., 2020b) datasets, achieving superior results with weighted F1 scores of 66.73% and 58.59% respectively. This research provides a significant contribution to the detection of offensive content on social media.

3. Dataset:

Our dataset is a collection of misogyny memes, explicitly focusing on the Tamil and Malayalam languages. Within this dataset, we have included monolingual and bilingual texts, where bilingual or code-mixed content poses an open research challenge (Raphel et al., 2023). Notably, some of the collected memes incorporate a blend of either Tamil and English or Malayalam and English.

In this task, our primary emphasis is on monolingual content, specifically Tamil or Malayalam. These two languages, Tamil and Malayalam, belong to the Dravidian language family, making them culturally significant and rich in linguistic diversity. By compiling this dataset, we aim to understand better the prevalence of misogyny memes in these languages and the linguistic and cultural dimensions that influence their creation and dissemination (Hossain et al., 2022b). This dataset provides valuable insights for researchers and practitioners seeking to address the issue of misogyny in the digital realm, particularly within the context of Dravidian languages (Sunitha et al., 2023; Selvi and Sreeja, 2023).

3.1. Misogyny Memes:

Misogynistic memes either directly or indirectly focus on women or girls, often using stereotypes, displaying bias, expressing hatred, or promoting discrimination (Ging and Siapera, 2018). Stereotyping of women or girls involves making

Figure 2: Sample meme with English translation of transcription and labels from Malayalam dataset

generalized statements such as "women cannot fight" or "women are not good at administration," which implies their inferiority based on gender. Another harmful behavior is diminishing their achievements by attributing success to appearance, luck, or external assistance rather than their abilities, hard work, or intelligence. Furthermore, devaluing female positions or achievements and mocking female-specific problems, experiences, or concerns with sarcastic comments or humor all contribute to reinforcing harmful stereotypes and biases (Mantilla, 2013; Jane, 2016).

The Figures 1 (a) and (b) depict the "Misogyny" and "Non-Misogyny" memes examples of Tamil, and Figure 2 (a) and (b) depict the Non-misogyny and Misogyny meme examples in Malayalam. In Figure 1 (a), The English translation of the transcription is " *Home - There's no salt in the curry. Are you a woman? Look at your face *social media - To birth as a woman you must

have done good penance ". The phrase "neeyellam oru pombalaya?" (Translation:- "Are you a women") specifically emphasizes "pombalaya," which is a term that translates to "woman" in English. This phrase appears to highlight or question the person's behavior or character by making a derogatory reference to their gender, which can be seen as an example of misogyny. Promoting respectful and inclusive language when discussing or addressing individuals is essential (Chakravarthi et al., 2023; Ponnusamy et al., 2023).

In Figure 1 (b), The English translation of the transcription is "It is common to throw affection when a woman is a lover and to throw a vessel after marriage when a woman is a wife." This statement doesn't inherently express misogyny; it reflects a general observation about how some people might behave in relationships. It doesn't make derogatory or harmful assumptions about

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women or their roles. However, it is important to remember that individual relationships and experiences can vary greatly, and not everyone adheres to these patterns.

In Figure 2 (a), The meme amusingly illustrates a student's habit of delaying work, depicting a dialogue where a son informs his mother about a delayed exam. The mother sarcastically remarks that since he only studies the day before the exam, the delay doesn't help him. The son cheerfully acknowledges that he enjoys the delay as a brief break from studying. This interaction has no connection to misogyny; it's a playful portrayal of the typical procrastination seen in students.

In Figure 2 (b), The conversation does touch upon traditional gender roles and expectations related to domestic tasks. However, it doesn't inherently express misogyny, which typically involves discrimination, prejudice, or hostility directed at women simply because of their gender.

3.2. Challenges and Collection methods

We curated Tamil and Malayalam memes by sourcing content from social media platforms, including Instagram[2], Facebook[3], and Pinterest[4] using APIs. This work was accomplished through the use of specific hashtags such as #daddys-littleprinces, #tamiltrendgirls, #mallugirls, #onam-celebrationsmemes, #keralagirlstroll, #womens-daymemes. This work aimed to establish a comprehensive repository dedicated to categorizing memes that revolve around the theme of misogyny. In order to classify these memes accurately, a comprehensive manual annotation process was employed. This involved discerning between content that disseminated misogynistic ideas and content that did not. Since memes typically consist of images and embedded text, the annotation process necessitated a meticulous examination of each meme's visual elements and textual components. The nature of memes as a medium for conveying ideas, often with a trace of humor or irony, required a nuanced approach to distinguish between those that perpetuated harmful stereotypes or misogynistic themes and those that did not. This required the annotators to consider visual and textual aspects, as these elements often work in tandem to convey a message or humor. As such, the annotators thoroughly evaluated the content, utilizing their judgment and expertise to

categorize each meme appropriately.

3.3. Transcription Creation

We employed three text extraction tools, namely EasyOCR[5], PytesseractOCR[6], and OCR – Image Reader[7], , to extract text from memes. Notably, PytesseractOCR and EasyOCR (Maithani et al., 2023) lacked support for Malayalam text. Therefore, we relied on OCR – Image Reader specifically for Malayalam text extraction. However, it is worth mentioning that both PytesseractOCR and EasyOCR provided the necessary support for extracting Tamil text (Ramamoorthy et al., 2022).

3.4. Annotation

The process of curating Tamil and Malayalam memes posed several challenges. Three individuals were assigned to annotate this task. Each of the three annotators underwent a meticulous annotation process to address these challenges (Suryawanshi et al., 2023). They closely examined both the visual and textual elements within each meme. This comprehensive analysis was crucial to ensure accurate categorization (U Hegde et al., 2021). The annotators drew upon their expertise and judgment to make informed decisions, categorizing the memes as either misogynistic or non-misogynistic based on the content's underlying themes and messages (Singhal et al., 2022). Throughout the process, the annotators encountered varying complexity in meme interpretation. Some memes conveyed their message primarily through visual elements, while others relied more on embedded text (Pramanick et al., 2021). As a result, the annotators needed to consider both aspects to make precise annotations (Suryawanshi et al., 2020b).

Table 1 presents the details of our annotators, who played a crucial role in the dataset creation process. Our team comprises diverse annotators with various qualifications and language expertise. Among them, we have two male and one female annotator each holding a postgraduate degree with a strong command of the Tamil language, annotated for the Tamil language dataset. In our Malayalam annotation team, we have one male annotator with postgraduate qualifications and a deep understanding of the Malayalam language, alongside two female annotators, one of whom holds a Ph.D. and the other holds a postgraduate degree. This diverse and qualified team

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[2]https://developers.facebook.com/docs/instagram-basic-display-api/

[3]https://developers.facebook.com/docs/graph-api/

[4]https://developers.pinterest.com/docs/api/v5/

[5]https://github.com/JaidedAI/EasyOCR

[6]https://github.com/indic-ocr/tessdata

[7]https://chrome.google.com/webstore/detail/ocr-image-reader/bhbhjjkcoghibhibegcmbomkbakkpdbo

Table 1: Annotator details.

Gender	Qualification	Language
Male	PG	Tamil
Female	PG	Tamil
Male	PG	Tamil
Male	PG	Malayalam
Female	PG	Malayalam
Female	Ph.D	Malayalam

Table 2: Dataset description.

Language	Misogyny	Non-Misogyny	Total
Tamil	448	1,328	1,776
Malayalam	400	600	1,000

ensures a comprehensive and well-informed approach to curating our dataset.

3.4.1. Annotation Guidelines

Misogyny: Misogynistic memes are the ones that directly or indirectly target women or girls through stereotyping, showing bias, hatred, and discrimination.
Key Features:

1. **Stereotyping of women or girls:** Making generalized statements like "women can't drive" or "women aren't good at wrestling" will suggest inferiority based on gender.

2. Objectification or sexualization of women or girls.

3. Expressions that belittle (the act of looking down upon women because of their gender), insult, or show prejudice against women.

4. **Victim-blaming:** Particularly in the context of gender-based violence or harassment against women

5. **Trivializing Feelings:** By telling a woman that she is "overreacting" or "being too emotional," that might devalue her feelings and thoughts.

6. Devaluation of female positions or achievements.

7. **Mockery:** making jokes about female-specific problems, experiences, or worries and portraying them as unimportant or absurd, sarcastic comments.

Non-Misogyny: Non-misogynistic memes are those that don't belittle, stereotype, or show prejudice against women or girls. They should be free from content that objectifies, sexualizes, or discriminates against females based on gender.

3.5. Inter Annotation Agreement

Inter-annotation agreement is a critical concept in the field of data annotation and annotation tasks, such as labeling, tagging, or categorizing data, to ensure the consistency and reliability of annotations made by multiple annotators or judges (Fleiss and Cohen, 1973). It measures the level of agreement or consensus among these individuals in their annotations, essential for ensuring the quality and validity of annotated data in various applications, including machine learning, natural language processing, and data analysis (Lottridge et al., 2023).

The calculation of inter-annotation agreement typically involves comparing the annotations provided by different annotators for the same data set. We utilized Krippendorff's Alpha (Krippendorff, 1970) for calculating the inter annotation agreement, which can be used with any number of annotators. The agreement coefficient measures the number of times annotators agreed on label mappings over what would be expected by chance. we used krippendorff[8] package for calculating the Krippendorff's Alpha. The scores obtained for Tamil and Malayalam datasets are 0.88268 and 0.89228.

3.6. Data Statistics

Our dataset, which we have collected, provides some notable statistics. In the dataset, we have identified 448 instances of misogyny in Tamil and 400 instances in Malayalam. Additionally, we have documented 600 instances of non-misogynistic language in Malayalam, while Tamil exhibits 1,328 instances. These findings emphasize the content within our dataset, underscoring the importance of addressing misogyny and encouraging the use of non-misogynistic language in both Tamil and Malayalam. As reflected in our dataset, this underlines our ongoing commitment to promoting respectful and inclusive language practices. Table 2 illustrates the description of the dataset.

4. Conclusion

In conclusion, the MDMD dataset of Tamil and Malayalam memes, which includes code-mixed English text and addresses the issue of misogyny, holds significant importance. It highlights the

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[8] https://pypi.org/project/krippendorff/

widespread problem of online misogyny in these communities and provides a valuable resource for researchers, activists, and policymakers to grasp better and combat this issue. Additionally, this dataset acknowledges the evolving nature of online communication, with its use of multilingualism and code-switching, offering a unique opportunity to study their connections with gender-related concerns.

Furthermore, it is positioned to support research in NLP, sociolinguistics, and gender studies, aiding in developing models for identifying misogynistic content and informing content moderation strategies. Moreover, it serves as an educational tool, raising awareness about the prevalence and consequences of online misogyny, thereby encouraging collective action. This dataset also opens doors for future research and expansion into various linguistic and cultural contexts, promising ongoing progress in addressing online misogyny and fostering safer digital spaces.

5.   Limitations

Creating our Tamil and Malayalam misogyny meme dataset comes with a few limitations. Firstly, the dataset's size and diversity may not represent the entire spectrum of misogyny memes in these languages. This limitation could lead to a bias in the dataset, as certain types or sources of memes may be overrepresented or underrepresented.

Secondly, there may be challenges in accurately assessing the context and intent of some memes. The context in which a meme is created and shared can significantly affect its interpretation, and without this context, the dataset may not fully capture the nuances of each meme. Furthermore, the dataset creation is subject to the availability of data sources, which may not cover all platforms or sources where such memes are circulated. This can result in an incomplete representation of the prevalence of misogyny memes in Tamil and Malayalam.

Finally, the dataset's content is static and may not account for evolving meme creation and distribution trends. Memes and their cultural significance can change rapidly, and the dataset may not reflect the most current developments. Despite these limitations, our dataset serves as a valuable starting point for analyzing misogyny memes in Tamil and Malayalam, shedding light on the issue and encouraging further research and awareness in this important area.

6.   Ethical Considerations

Our research primarily focuses on collecting and curating a dataset containing misogynistic memes. This dataset is a valuable resource for studying the language and expressions used in these memes, especially in contexts where they may be misused. We emphasize that we do not engage in the creation of models for generating or manipulating such content.

It is important to note that our dataset may inadvertently highlight specific online communities. However, all the memes within our dataset are openly available on the internet and have been archived. We believe that by providing the research community with a well-curated dataset that can better help them understand the language and expressions in misogynistic memes, we contribute to the development of countermeasures against potentially harmful content, raise awareness, and aid in the mitigation of its spread on the internet. As an additional safeguard, search engines do not index our dataset, and we require all users to provide their academic affiliation as a condition to access the data.

7.   Acknowledgement

8.   References

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