Categorizing Memes about Abortion

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Abstract

Abortion is a highly polarized issue in the US, resulting in a large number of pro- and anti-abortion memes on social media platforms. Identifying broad meme themes is crucial for developing a targeted and strategic counter response to rampant polarization regarding this contentious medical procedure. We address the indicated issue through the following contributions: 1) Creation of an annotated dataset of pro- (n=230) and anti-abortion (n=187) memes; 2) Identification of broad themes within the pro- and anti-abortion categories. Results demonstrated that both pro- and anti-abortion memes characterize the opposing side as being disingenuous and inconsistent, likely contributing to increased polarization. Stakeholders including healthcare providers and lawmakers may utilize our findings to develop targeted strategies to mitigate polarization. Keywords: Social computing; Abortion; Memes; Polarization

Introduction

In 1973, the Supreme Court legalized abortion as a constitutional right in the United States in the *Roe vs. Wade* ruling. In June of 2022, the Supreme Court overturned Roe vs. Wade, and while some states independently protected abortion rights, trigger laws went into effect in others, limiting access to abortion for women in those states (Housman 2022). The legal status of abortion and its intricate links to religion are highly complex issues contributing to significant polarization. Both pro- and anti-abortion movements utilize memes to express their beliefs and further garner support for their viewpoint, which may have contributed to further polarization on the issue (Conti and Cahill 2017). We define a meme as a cultural item, such as an idea, behaviour, or style, disseminated through the internet, usually through social media platforms. Memes generally incorporate both images and text. To combat further polarization, it is critical for relevant stakeholders to identify and assess broader themes within abortion memes. Stakeholders can use these identified themes to develop interventions that reduce polarization. There currently exists no annotated dataset of abortion memes, central to developing machine learning classifiers that may aid interventions around polarization (Sharma et al. 2017). We address the indicated issues through the

following contributions: 1) Creation of an annotated dataset of pro-abortion (n=230) and anti-abortion (n=187) memes; 2) Identification of broad themes within the pro- and anti-abortion categories.

Related Work

Abortion Memes

Work on abortion memes is limited. Recent work uses content analysis around the proposed legalization of abortion in Argentina in 2018, with a focus on the use of images of fetuses (McReynolds-Pérez 2022). Another study used textual material drawn from social media profiles of pro- and anti-abortion movements in Poland following a week of intense street protests and publicity activities (19–26 October 2016) (Molek-Kozakowska and Wanke 2019). This study explored the argumentative schema used in claim-making and the rhetorical resources for stance-taking in the online abortion law debate in Poland in late 2016. Other work used participant observation online and Canadian blogs and newspapers to explore the SupportIslandWomen pro-choice initiative in Prince Edward Island (PEI), Canada (Myles 2019). Finally, a study analyzed the discussion on Twitter about an abortion bill in Chile, finding that Twitter has strong biases in population representation (Graells-Garrido, Baeza-Yates, and Lalmas 2019). While past work detailed social media narratives around abortion globally, previous research did not explore abortion memes, or assemble datasets for developing pro- or anti-abortion meme classifiers despite their prevalence.

Polarizing Memes

Existing research on polarizing memes is limited. One study focused on two widely circulating memes in the anti-vaccination movement, namely lists of vaccine ingredients containing mercury, and quotes attributed to Mahatma Gandhi (Buts 2020). The article analyzed both memes, and illustrated how the repurposed, often ironic use of visual tropes can either undermine or strengthen the accompanying claims, exploring how memes can function as vehicles for the spread of controversial health-related information. Another study used an experimental design to examine the credibility and persuasiveness of COVID-19-related memes (Wasike 2022). Results indicated that memes with expert source attribution are more credible than those with nonex-

pert source attribution. A positive correlation between the credibility of a meme and its persuasiveness was observed. Overall, previous work provides an overview of polarizing memes, but does not explore abortion-related memes.

Complementarily, several classifiers for offensive (Suryawanshi et al. 2020) or hateful (Lee et al. 2021; Zhu, Lee, and Chong 2022) meme content exist. However, there are limited meme classifiers and no classifiers around abortion memes. We provide an annotated dataset covering abortion memes, aiding the development of abortion-centric meme classifiers.

Data

A list of keywords was derived from literature reviews on abortion (Hanschmidt et al. 2016): Abort*, termination of pregnancy, terminate pregnancy, pregnancy termination, post-abortion, postabortion, roe v wade, prolife, right-to-life, anti-choice, pro-abortion, pro abortion. The keyword list was reviewed independently by two content experts, and only keywords approved by the content experts were used. These keywords were used to search for and collect all relevant memes from the following sites: memegine.com; knowyourmeme.com. The keywords were also used in conjunction with the word meme, e.g., Roe vs. Wade meme, to obtain all memes within the first 20 pages in a Google image search.

Methods

Two content experts then independently coded (85% agreement) the resultant 1979 memes into three categories: pro-abortion; anti-abortion; irrelevant. We selected content experts who had published at least five academic articles on polarization and/or abortion, defined broadly.

We used a three-tiered process to for initial sorting of memes. Memes were divided equally among experts. Experts first wrote bullet point one sentence summaries about each meme. Summaries were used to broadly detail meme content. Example summaries: Guns kill children but abortion is fine; Abortion is sinful but killing children is fine. Memes, now with summaries, were then randomly reassigned to each expert. Experts then assigned three separate scores to each meme. The scores related to relevance to the categories: pro-abortion; anti-abortion; irrelevant. The scores were on a scale of 10. 10=most relevant to theme, 0=not relevant at all. For example, if a meme was only relevant to pro-abortion, it would receive a score of 10 for pro-abortion, and a score of 0 for the anti-abortion, and irrelevant categories. Similarly, if a meme was somewhat relevant to the pro-abortion, and anti-abortion, it would receive scores of 5 for both those categories, and a score of 0 for irrelevant. After scores had been assigned for all memes, experts, as a group, reviewed each meme to assign it to pro-abortion, anti-abortion, and irrelevant categories. A third content expert made the final decisions on coding disagreements. There were rarely coding disagreements, and memes generally fit into a single category. Irrelevant memes were deleted to result in 230 pro-, and 187 anti-abortion memes. Examples of irrelevant memes included screenshots of social media posts, such as tweets, and those which had too low of a resolution to determine the content. We sought to develop multimodal classifiers to detect pro- and anti-abortion memes, but were unable to do so due to limited data. Few-shot multimodal classification methods were not able to be applied to our dataset, due to computing costs and other issues.

We then grouped memes within the pro- and anti-abortion meme groups into broad themes. We first used DeepCluster. However, due to limited data, clusters were not meaningful and we categorized memes manually. Determining the threshold where DeepCluster would be viable was beyond the scope of this paper. However, given the relatively low volume of memes being considered for this paper, DeepCluster would definitely not be feasible for our present dataset. Two content experts independently coded the pro- and anti-abortion memes separately to identify broad themes. Building on the one sentence summaries about each meme, experts separately wrote longer summaries (at most three sentences) about the context and broader meaning of each meme. These longer summaries illustrated what the memes were about and what topical area they were addressing, such as liberal hypocrisy, or gun rights. Based on these summaries, experts then wrote up to five keywords detailing the meme content: e.g., access, hypocrisy, religion. Finally, after keywords had been assigned for all memes, experts, as a groups reviewed each meme to assign it larger categories based on its keywords. For example, if a meme involved disagreeing with abortion due to religious beliefs, *Religion* would be assigned as the category. Each meme could only be assigned to one category. Coders then reviewed thematic groups with two or fewer memes to see if these groups could be subsumed into larger thematic groups. Where experts wished to assign a meme to more than one category, a third content expert made the final decisions on coding disagreements.
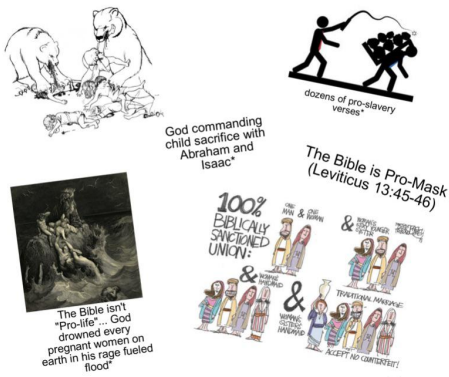
Results

Pro-Abortion Memes

Three broad themes were identified for pro-abortion memes (n=230): Religion (n=15), Inconsistent Conservative Positions (n=118), and Lack of Abortion Access (n=97).

Religion memes (Figure 1) tended to dispute or make light of religious texts. These memes may result from views that certain Christian denominations are opposed to abortion. Additionally, memes within this category focus on supposed discrepancies between certain Christians' purportedly excessive anti-abortion advocacy and simultaneous neglect of other key tenets of the Christian tradition.

The Inconsistent Conservative Positions category (Figure 2) focuses on how conservatives position themselves as anti-abortion but are purportedly racist and/or pro-war. Examples of such memes suggest that anti-abortion supporters are against abortion but are fine with loss of life resulting from war. These memes may suggest that anti- abortion supporters have inconsistent political positions and are disingenuous. The particularly polarizing aspect of this meme category may be the mocking of the alleged superficial patriotism of conservatives, limited to overseas violence.

Figure 1: Religion

Figure 2: Inconsistent Conservative Positions

Lack of Abortion Access memes (Figure 3) are a satirical take on alternative steps those in conservative states can take if they require an abortion. Examples of such memes indicate techniques such as inflicting trauma on oneself or a roller coaster ride. These memes purport that abortion access is critical and those requiring abortion in states with limited access are likely to engage in medically unsafe alternatives. This may further polarize conservative audiences on social media platforms that tend to heavily criticize depictions of abortions that do not highlight the gravity of the procedure, ethically, physically, and emotionally.

Anti-Abortion Memes

Two broad themes were identified for anti-abortion memes (n=187): Religion (n=15) and Inconsistent Liberal Positions (n=172).

Anti-abortion memes around religion (Figure 4) use religion to justify pro-abortion beliefs. Such memes indicate that life begins at conception. Some of these memes suggest that wider access to contraception leads to a higher prenatal death rate. These memes build on religious support for abortion, and may be part of larger campaigns around religious conservatism.

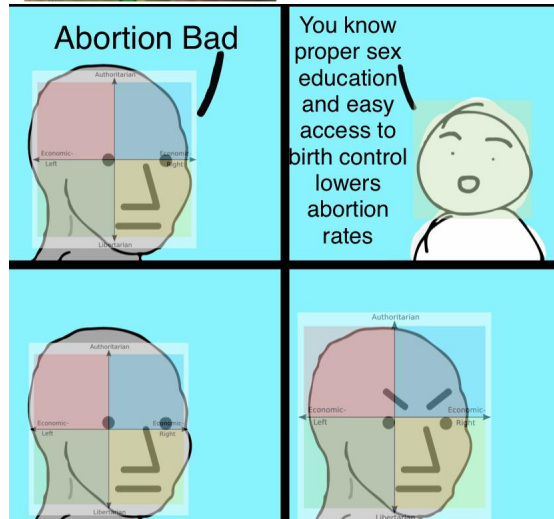Inconsistent Liberal Positions (Figure 5) indicate that liberals have nonsensical political positions. Example memes indicate that liberals are for stricter gun laws to save lives, yet want to engage in abortion, supposedly ending a life. Such memes portray pro-abortion individuals as intolerant to opposing beliefs and hysterical, bolstering the perception that those who support abortion should not be taken seriously. Other such memes vilify women who get abortions as being promiscuous or irresponsible. These memes tend to feature racist stereotypes about women being sexually active.

Discussion

Implications of Findings

Our goal was to sort abortion memes into pro- and anti-abortion categories, and then further classify them into broad themes within these categories. A strength of our work is our systematic annotation strategy. The systematic strategy we employed suggests the veracity of our findings and we hope that results can add to research and policy around limiting polarization around abortion. Results demonstrated that both
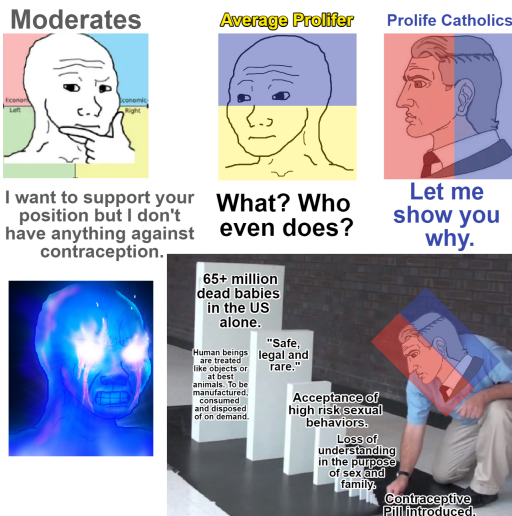
Figure 3: Lack of Abortion Access

Figure 4: Religion

pro- and anti-abortion memes characterize the opposing side as being disingenuous and inconsistent, perhaps in a reactive fashion, and contributing to increased polarization. Our findings build on previous work around social media narratives regarding abortion. However, previous work does not explore abortion memes, instead centering on other forms of media, and we thus provide an overview of memes around the abortion.

Recommendations

Our dataset can provide a range of insights, as follows. Key to mitigating polarization around abortion are targeted efforts that focus on the underlying themes of such memes. Both pro- and anti- abortion memes forward negative views regarding the opposing side. Interventions that bring pro- and anti-abortion media creators together to find common ground, may reduce polarization around the topic (Chen et al. 2022, 2023). Such strategies may not only mitigate polarization, but also improve mental health of those involved in the abortion debate (Nayak et al. 2021). Stakeholders generating memes and creative content can also consult evidence-based sources to ensure their content is culturally appropriate and non-offensive. These efforts can contribute to a content creator base which will allow for further advocacy for evidence-based abortion policy-making leading to improved health outcomes (Flecha Ortiz et al. 2020). Future work will explore how often these memes are shared on social media, simultaneously helping us to expand the number of memes in the dataset. Future work will involve directed acyclic graphs (DAG) or decision rules to illustrate how a human coder decides a meme is part of a category. These frameworks will assist the creation of chain-of-thought prompting and stance detection for abortion meme categorization. Future research will include a focus on meme metadata. We will also determine if some memes are more popular than others, to explore if meme popularity is related to factors such as content, lexical density, or source, and if some categories of memes are more likely to go viral. Similarly, time spent on classifying each meme could be a useful metric in determining its virality. For example, more complex memes may be limited in their proliferation, and future work can explore how classification time is related to virality. Similarly, future research can detail sharing prevalence of particular memes. We can also add date of first meme appearance, thus tracing particular lineages or consistent themes across memes.

Limitations

Our findings relied on the validity of data collected with our search terms, and there may be memes which did not include our search terms. Future work will review meme subreddits e.g., r/memes, r/dankmemes, and other sources to determine if there are colloquial keywords that can be included in search terms. It is possible that memegine.com; knowyourmeme.com potentially filtered more offensive memes, thereby limiting our dataset. Our data may not be generalizable to non-English language memes around abortion. We will include non-English terms in future work. We were unable to develop multimodal classifiers for pro- or

anti-abortion memes due to limited data and the limitations of computational tools. Given recent advancements in multi-modal zero-shot and few-shot classification, we hope that future techniques will allow us to build meme classifiers with limited data, allowing us to respond swiftly to polarization online.

Data availability statement

The data sets generated during and analyzed during this study are not publicly available due to the paper being a work in progress but are available from the corresponding author on reasonable request.

Acknowledgments

References

Buts, J. 2020. Memes of Gandhi and mercury in anti-vaccination discourse. *Media and Communication*, 8(2): 353–363.

Chen, K.; Babaeianjelodar, M.; Shi, Y.; Janmohamed, K.; Sarkar, R.; Weber, I.; Davidson, T.; De Choudhury, M.; Yadav, S.; Khudabukhsh, A.; et al. 2022. Partisan US News Media Representations of Syrian Refugees. *arXiv preprint arXiv:2206.09024*.

Chen, K.; Feng, A.; Aanegola, R.; Saha, K.; Wong, A.; Schwitzky, Z.; Lee, R. K.-W.; O'Hanlon, R.; De Choudhury, M.; Altice, F. L.; et al. 2023. Categorizing Memes About the Ukraine Conflict. In *Computational Data and Social Networks: 11th International Conference, CSoNet 2022, Virtual Event, December 5–7, 2022, Proceedings*, 27–38. Springer.

Conti, J. A.; and Cahill, E. 2017. Abortion in the media. *Current Opinion in Obstetrics amp; Gynecology*, 29(6): 427–430.

Flecha Ortiz, J. A.; Santos Corrada, M. A.; Lopez, E.; and Dones, V. 2020. Analysis of the use of memes as an exponent of collective coping during covid-19 in Puerto Rico. *Media International Australia*, 178(1): 168–181.

Graells-Garrido, E.; Baeza-Yates, R.; and Lalmas, M. 2019. How representative is an abortion debate on twitter? In *Proceedings of the 10th ACM Conference on Web Science*, 133–134.

Hanschmidt, F.; Linde, K.; Hilbert, A.; Riedel-Heller, S. G.; and Kersting, A. 2016. Abortion stigma: a systematic review. *Perspectives on sexual and reproductive health*, 48(4): 169–177.

Housman, P. 2022. Roe v Wade overturned: What it means, what's next.

Lee, R. K.-W.; Cao, R.; Fan, Z.; Jiang, J.; and Chong, W.-H. 2021. Disentangling hate in online memes. In *Proceedings of the 29th ACM International Conference on Multimedia*, 5138–5147.

McReynolds-Pérez, J. 2022. Fetal Aspirations: The Humorous Meme as a Mobilizing Tactic. *Mobilization*, 27(2): 193–210.

Molek-Kozakowska, K.; and Wanke, M. 2019. Reproductive rights or duties? The rhetoric of division in social media debates on abortion law in Poland. *Social Movement Studies*, 18(5): 566–585.

Myles, D. 2019. 'Anne goes rogue for abortion rights!': Hashtag feminism and the polyphonic nature of activist discourse. *New Media & Society*, 21(2): 507–527.

Nayak, S. S.; Fraser, T.; Panagopoulos, C.; Aldrich, D. P.; and Kim, D. 2021. Is divisive politics making Americans sick? Associations of perceived partisan polarization with physical and mental health outcomes among adults in the United States. *Social Science & Medicine*, 284: 113976.

Sharma, E.; Saha, K.; Ernala, S. K.; Ghoshal, S.; and De Choudhury, M. 2017. Analyzing ideological discourse on social media: A case study of the abortion debate. In *Proceedings of the 2017 international conference of the computational social science society of the americas*, 1–8.

Suryawanshi, S.; Chakravarthi, B. R.; Arcan, M.; and Buitelaar, P. 2020. Multimodal meme dataset (MultiOFF) for identifying offensive content in image and text. In *Proceedings of the second workshop on trolling, aggression and cyberbullying*, 32–41.

Wasike, B. 2022. Memes, Memes, Everywhere, nor Any Meme to Trust: Examining the Credibility and Persuasiveness of COVID-19-Related Memes. *Journal of Computer-Mediated Communication*, 27(2): zmab024.

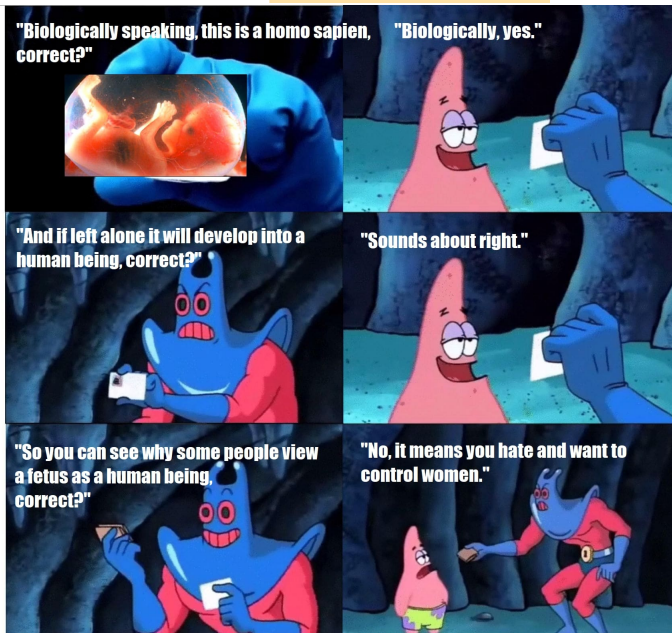Zhu, J.; Lee, R. K.-W.; and Chong, W. H. 2022. Multimodal Zero-Shot Hateful Meme Detection. In *14th ACM Web Science Conference 2022*, 382–389.

Figure 5: Inconsistent Liberal Positions