Digital Media Engagement and Health Communication: Analyzing YouTube Reactions to a Brain Dead Pregnant Woman Case

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Abstract. Public discourse and emotional engagement on YouTube surrounding a controversial case of a brain-dead pregnant woman maintained on life support to sustain fetal development are examined in this study. A mixed methods design was used to analyze the comments on YouTube videos related to the case of a brain-dead pregnant woman kept on life support to allow the fetus to live. Machine driven classification of open responses (MDCOR) was used to identify how users constructed their comments around discursive frames and sentiment and affective network analysis (SENA) was used to determine if there were any differences in sentiment across the videos from different sources. Additionally, the study explored how health literacy emerged as a thematic pattern. The analysis revealed that the public's responses to this controversial issue constructed different types of responses reflecting different attitudes and emotions towards the case. These in turn revealed differences in health literacy and in access to credible health information sources.

1 Introduction

Atlanta nurse Adriana Smith was pronounced brain dead on February 19th, 2025, while she was approximately nine weeks pregnant, an ethically controversial situation that sparked intense public debate and high levels of online participation. The ethically controversial situation, dubbed the Brain-Dead Pregnancy Case (BDPC), revolved around the medical and legal issue of maintaining physiological functions with life support to support fetal development. Despite her condition being irreversible, Smith was on mechanical support until an emergency cesarean section took place on June 13, with life support being withdrawn three days later June 17. When stories of this nature appear in the digital public sphere, they often attract a lot of attention and polarized responses due to varying moral, cultural, emotional, ideological, and religious positions. Public opinion on ethically controversial medical dilemmas such as the BDPC not only highlights the prevailing values that exist within a society, but also demonstrates how individuals use digital media to make sense of, negotiate with, and contest controversial bioethical issues.

To explore these questions, this study analyzes user comments on YouTube videos reporting on the BDPC at Emory University Hospital Midtown in Atlanta, Georgia, where

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Adriana Smith was kept on life support to continue her pregnancy due to state abortion restrictions. YouTube was selected as the primary platform for analysis because of its global reach and capacity to foster large scale, real time public engagement. As a prominent digital platform defined as an online infrastructure that enables users to create, share, and interact with content YouTube facilitates not only diverse participation across languages and cultures but also plays a central role in shaping how ethically charged issues like the BDPC are publicly discussed and contested.

Building on this platform specific rationale, the present study analyzes a curated set of YouTube videos that report on the BDPC. Employing machine learning techniques, the study collects and examines user comments to identify dominant discursive patterns and thematic variations. In addition, it conducts sentiment analysis to assess how sentiment patterns vary across videos published by different media sources. This dual approach enables the exploration of how framing strategies and audience composition influence both the form and tone of public discourse.

By understanding the diverse discourses and emotional responses surrounding BDPC, this study highlights the need for greater recognition of women's autonomy and voice in healthcare decision making and the critical importance of raising public awareness of reproductive health and rights. These insights lay the foundation for future research exploring how discourse influences perceptions of bodily autonomy and how this can guide health communication strategies [1][2].

2 Conception Foundation

2.1 Research Question

Based on the background outlined in the introduction, this study aims to address the following research questions: (1) How do users construct different discourses in their comments on videos related to the BDPC? (2) How does sentiment analysis vary across videos from different publishing sources? (3) Is there any evidence to support the existence of health literacy among these emerging themes?

2.2 Rationale for Selecting a Digital Media Platform for Analyzing Public Engagement

2.2.1 The Evolution of a Digital Platform for Moral Discourse and Affective Publics

YouTube, a leading digital platform that integrates content dissemination and public interaction, has become a key venue for the active negotiation of moral discourse among affective publics digitally connected communities that express shared emotions, values, and ideological positions on social issues [3][4][5]. Beyond serving as a passive information channel, YouTube fosters discussions of complex ethical issues characterized by diverse emotional expressions by engaging diverse users around the globe [6]. Comment sections serve as dynamic micro publics where competing moral narratives emerge, enabling individuals to express diverse emotions, ranging from support to outrage and challenge to dominant frameworks. In the context of BDPC, the platform provides a rich environment for studying how publics engage with topics such as reproductive ethics, bodily autonomy, and government intervention through everyday digital discourse [1][2].

2.2.2 Advantages over Other Digital Platforms

Compared to other social media platforms, YouTube uniquely combines visual storytelling with extensive and sustained commentary interaction, fostering deeper and more nuanced public discussion of bioethical controversies [7][3]. While platforms like Twitter prioritize brevity and TikTok emphasize algorithmically driven entertainment cycles, YouTube supports more complex emotional and ideological expressions [4]. Its participatory infrastructure encourages a diverse public to directly engage with ethically sensitive content, fostering vigorous debates around critical topics such as reproductive rights and end of life care. Furthermore, the platform's algorithmic mechanisms amplify popular and polarizing content, shaping public opinion and discourse [7][3]. These characteristics make YouTube particularly well suited for analyzing how digital audiences construct and express emotions in real time.

2.3 The Importance of Studying Ethically Charged Digital Discourses

2.3.1 Ethical Controversies as Reflections of Gendered Social Values

The discussions surrounding cases like the brain death pregnancy controversy serve as a critical lens through which we can uncover deeper social contradictions, particularly those related to gender, reproductive autonomy, and bodily sovereignty. Public debates surrounding the body and morality often reveal normative assumptions about whose lives are considered valuable or worth mourning. These assumptions are particularly evident in ethically complex situations such as medical futility and pregnancy, highlighting the persistent inequalities in the social and moral construction of women's bodies and their choices. Therefore, the BDPC case not only presents bioethical dilemmas but also reveals the legal and cultural struggles over women's rights to their own bodies [3][4][5].

2.3.2 Digital Platforms as Arenas of Unequal Visibility and Moral Contestation

The BDPC exemplifies how ethically complex medical events gain heightened visibility and discursive life through digital platforms like YouTube [3][7]. These platforms not only serve as public arenas for moral deliberation, but also actively shape which narratives are amplified and which are marginalized [4]. The BDPC triggered widespread sentiment laden and ideological reactions online, revealing deep societal divisions concerning reproductive rights, medical authority, and the moral status of fetal life. Yet, access to these digital spaces and influence within them is not evenly distributed. Disparities in digital access, literacy, and social power often determine whose voices are legitimized [8]. In this sense, YouTube becomes both a mirror and a magnifier of structural inequalities: while some users frame the case through religious or legalistic lenses that foreground fetal personhood, others struggle to assert perspectives rooted in bodily autonomy or gender justice. Studying such a controversy allows for critical insight into how public health ethics are debated, negotiated, and contested in real time across digital environments making BDPC an especially instructive case for analyzing the intersection of gender, bioethics, and mediated discourse [6][9].

2.3.3 Historical and Contemporary Approaches to Maternal Brain Death and Reproductive Ethics

Historically, decisions regarding brain dead pregnant women were made largely within medical institutions, often driven by clinical paternalism and fetal viability rather than patient

autonomy or ethical consensus. Legal guidance was limited, and public scrutiny was rare. In contrast, contemporary cases such as the BDPC and Lougheed, T. unfolds in highly visible, politicized digital environments [3][4]. Medical decisions today are shaped not only by law and science but also by social media discourse, online activism, and polarized ideological debates.

The BDPC has emerged as a particularly high-profile ethical controversy in 2025, drawing unprecedented public and media attention worldwide [6]. This surge reflects a broader cultural moment marked by intensified debates over reproductive rights, bodily autonomy, and gender justice [1]. The case crystallizes ongoing struggles to achieve health equity, especially for women and marginalized populations who face systemic barriers to autonomous and respectful healthcare [8][2].

Its prominence underscores how bioethical dilemmas that once remained confined to private medical settings now serve as catalysts for public discourse, mobilizing digital publics around questions of life, death, and reproductive freedom [3][7]. Examining the discourse surrounding BDPC thus provides critical insight into the intersecting issues of gender, health, and social justice, contributing to the development of inclusive, rights-based health communication strategies aimed at promoting equitable healthcare access for all.

2.4 Health Literacy and Digital Discourse on Health Communication Issues

2.4.1 Health Literacy as a Social Determinant in Health Decision Making

Health literacy, the ability to access, understand, and apply health information, is one of the key determinants of autonomy and informed choice in health care [10]. Previous studies show that differences in health literacy affect people's ability to understand medical advice and engage in suitable health behaviors [11]. Health literacy is determined by education, literacy, culture, and socioeconomic status [12][13]. People living in economically privileged areas usually enjoy better education and health care than those living in disadvantaged or rural areas, who tend to have structural disadvantages that prevent them from accessing these factors [8][2]. Therefore, health literacy cannot be regarded as an individual characteristic, but as an upstream social determinant linked to structural inequalities [12][14]. This social dimension is especially important in ethically delicate situations, such as the BDPC, when decision making is influenced by emotional pressure and a lack of knowledge about medical and legal alternatives.

2.4.2 Evidence of Health Literacy Gaps in User Generated Digital Discourse

Analyses of discourse on the web reveal continuing gaps in health literacy [12][14]. Public comments on the web often show a disregard for ethical issues and patients' rights, and some have highlighted an ignorance of options available to dispute medical opinions. However, popular accounts have tended to be sensationalist, reducing women to passive recipients and obscuring ethical principles of informed consent and autonomy. Thus, the failure to give consent is evident not only in the brain-dead pregnant woman but also in the marginalization of health literacy and patient empowerment in public opinion.

3 Data and Methods

3.1 Data Collection

This study draws data from user comments on three YouTube videos exploring the controversial case of a brain-dead woman continuing to have a pregnancy. These videos were

selected based on their relevance to the case, their publication dates coinciding with key developments, their high user engagement, and their diverse dissemination sources. The analyzed videos were titled "Georgia's Heartbeat Law Keeps Pregnant Woman Declared Brain Dead Alive" (Video A), attracting 5,585 comments. NBC News was selected due to its national recognition and journalistic credibility, providing a broad mainstream perspective on the event. "Georgia Brain Dead Mother Gives Birth to Baby Four Months Later, Life Support to Be Removed Today" (Video B), published by 11Alive on June 17, 2025, garnered 6,529 comments. As a local news outlet based in Atlanta, 11Alive offers valuable regional insights and community focused reporting related to the incident's geographic context. "Breaking News: Brain Dead Woman Forced to Pregnant Under Abortion Law Finally Gives Birth" (Video C), published by Indisputable with Dr. Rashad Richey on June 19, 2025, received 519 comments. This podcast was chosen for its opinion driven and politically progressive commentary, which contrasts with traditional news media and adds an ideologically explicit dimension to the public discourse. Together, these videos provide rich data for comparative analysis of discursive framing and emotional patterns across different dissemination platforms, consistent with this study's goal of exploring public engagement and attitudes toward ethically complex health issues.

The URLs of the videos are:

- Video A: https://youtu.be/I4c P0ZYSbo
- Video B: https://youtu.be/FZ7S7Zyyy Y
- Video C: https://youtu.be/mTONsC8dsUU

All user comments posted under these videos were extracted and compiled into a dataset. Video A was selected for in depth discourse analysis, while all three videos were included in the sentiment and emotion analysis. The data represent spontaneous public responses, making them valuable for analyzing digital health discourse and emotional framing in public communication.

3.2 Methods

To explore thematic and emotional features of public discourse on the incident, we applied a hybrid methodological approach combining discourse frame analysis and sentiment modeling, specifically Machine-Driven Classification of Open Responses (MDCOR) and Sentiment and Affective Network Analysis (SENA). These are suitable tools for large scale YouTube comment datasets because they allow for the identification of distinct discursive themes and mapped variations of fine-grained sentiment without diminishing contextual meaning or the original voices of participants. The results obtained from these tools provided useful clues to address the research questions on how users construct meaning and display health literacy in digital health controversies. This analysis was particularly useful for exploring public responses to the BDPC.

MDCOR is a computational framework that is built upon machine learning and automated text classification techniques to classify open responses while maintaining contextual meaning and the original voices of participants without the need for manual coding or programming knowledge. It can handle different types of data, such as cross sectional and longitudinal responses [15] SENA is an analytical framework accompanied by no code software tools that brings together natural language processing, linguistic analysis, and data science techniques to qualitative and mixed methods research, enabling the identification of different emotional patterns at different levels across groups and platforms, thus facilitating exploratory and rigorous investigation of affective dimensions without the need for programming skills [6].

3.3 MDCOR Discourse Frame Analysis

MDCOR was applied to the comments extracted from Video A. This method facilitates the identification and classification of dominant discourse frames and thematic patterns by mapping co-occurring concepts and phrases.

3.4 SENA Discourse Frame Analysis

SENA was first applied to comments from all three videos (Videos A, B, and C) to identify overall sentiment trends and emotional expressions, categorizing sentiments into positive and negative, and classifying discrete emotions such as sadness, fear, joy, and trust. Following this broad analysis, the emotional profile of Video A was examined in greater detail and compared against the aggregated sentiment and emotion patterns observed across all three videos. Entropy scores were calculated to assess the variability and consistency of emotional expression within each video and comparatively across videos. Through cluster visualizations and keyword clouds, differences and similarities in affective engagement were further explored.

4 Results

4.1 MDCOR Based Systematic Classification of Public Comments on Video A

A purposive sample of approximately twenty representative comments was selected from the comment section of Video A to capture diverse public perspectives on a sensitive medical ethical case involving a brain-dead pregnant woman. The comments were analyzed using the Machine-Driven Classification of Open-Ended Responses (MDCOR) method, enabling automated text classification. Based on the evaluation of MDCOR's metrics plot, six distinct thematic categories were identified.

Based on the MDCOR output, the six themes derived from the text classification are: V1. Concerns regarding medical neglect and misdiagnosis in emergency departments, particularly affecting pregnant or postpartum women; V2. Critiques of government overreach and legal mandates forcing pregnancy continuation despite brain death, highlighting violations of bodily autonomy and ethical issues; V3. Support for sustaining the pregnancy to honor the presumed maternal wish and the fetus's right to life; V4. Advocacy for women's bodily autonomy and calls for legal reforms prioritizing maternal rights over fetal interests; V5. Condemnation of restrictive abortion laws that mandate pregnancy continuation in cases of maternal brain death; V6. Expressions of emotional and spiritual responses, often invoking religious faith and compassion. It can be concluded that public opinion on this case is deeply divided, encompassing concerns about medical care, legal and ethical conflicts, respect for maternal autonomy, and emotional as well as spiritual reflections. These findings reveal the complexity and multidimensional nature of societal attitudes towards such sensitive medical ethical issues.

4.2 SENA Based Comparative Analysis of Sentiments in Public Comments Across Videos A, B, and C

Figure 1 presents the sentiment analysis, conducted using the SENA framework, of twenty representative comments selected from Video A based on the MDCOR thematic classification. The sentiment distribution, characterized by moderate entropy and relatively lower consistency (mean entropy = 0.579), indicates a moderate degree of emotional

diversity within the dataset. Specifically, the mid-level entropy suggests that the proportions of sentiment categories are neither heavily skewed nor uniformly distributed, reflecting a heterogeneous emotional landscape. The observed lower consistency signifies notable variation in sentiment patterns across different thematic clusters, implying that each theme is associated with a distinct affective profile. Notably, Figure 1 also shows that positive emotions predominate across all six thematic clusters, with positive sentiment proportions exceeding those of negative emotions in each theme. Collectively, these metrics reveal a dispersed spectrum of public emotional responses, emblematic of the multifaceted nature of contentious social issues.

Within the negative emotions, fear and sadness predominate, reflecting public shock and apprehension regarding the enforced continuation of BDPC, and highlighting concerns about violations of women's reproductive autonomy and associated ethical issues. Conversely, positive emotions such as trust, joy, and anticipation appear more frequently in the sentiment analysis. However, it is crucial to emphasize that positive sentiment detected by the SENA framework represents the linguistic prevalence of positive affective terms rather than direct endorsement or approval of the incident. That is, the frequent use of positively classified words does not necessarily indicate supportive attitudes toward the event itself. Instead, these positive expressions often convey hope, trust in medical or legal institutions, compassion, and moral reasoning across various themes, particularly in discussions advocating pregnancy continuation and emotionally or spiritually framed responses. Furthermore, even within more critical themes, positive language commonly emerges in calls for reform or empathetic appeals, illustrating the coexistence of constructive affect and critique within public discourse and underscoring the complexity and nuance of public emotional engagement with ethically charged issues.

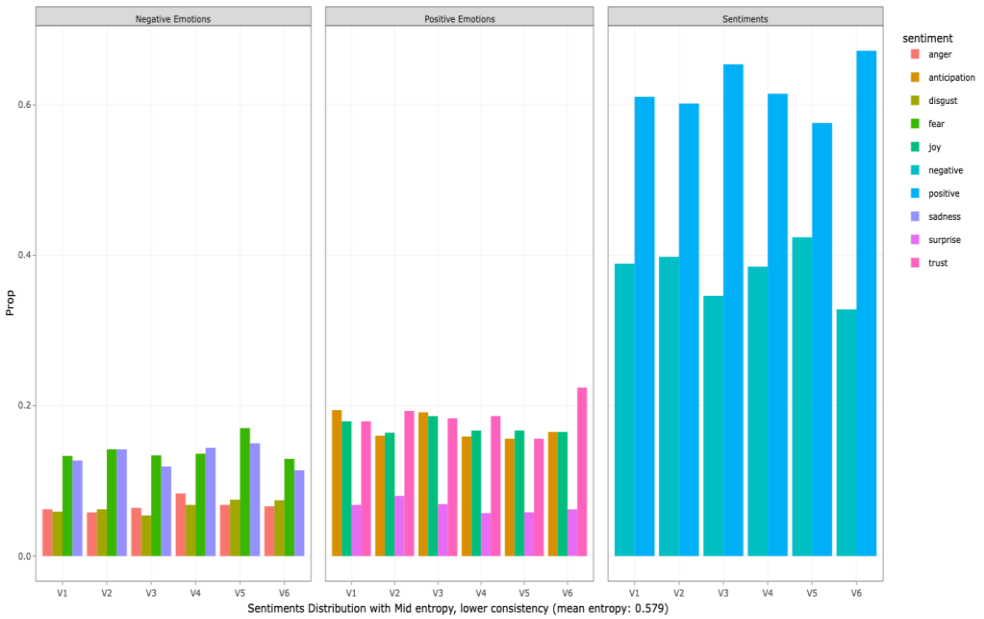

Fig. 1. Sentiment and Emotion Analyses of different comment themes from V1 to V6 About BDPC Case Video A.

Figure 2 presents the sentiment distribution of comments associated with Video ABC. Within negative emotions, fear and sadness predominate, reflecting public shock and apprehension regarding the enforced continuation of the BDPC and highlighting public concern regarding ethical implications and the societal impact of the enforced continuation

of the BDPC. Positive emotions still including trust, joy, and anticipation, appear more frequently than other positive categories, indicating that some users express support for ethical decision making, empathy toward affected families, or hope for justice. The high consistency (mean entropy = 0.178) indicates that sentiment patterns are relatively uniform across comment topics. Compared with Figure 1, the emotion distribution in Figure 2 is more uniform, but the results are more positive than negative.

While SENA's results indicate that positive emotions (such as trust, joy, and anticipation) are more common than negative ones, this doesn't necessarily mean the public is comfortable with the mandatory continuation of the BDPC. Essentially, SENA labels text based on a sentiment lexicon or machine learning model, breaking each comment or sentence into different sentiment categories. SENA counts the number of label occurrences, not the emotional intensity of each comment. A comment might contain strong fear but also trust or anticipation (e.g., "I'm very afraid this will happen, but I hope the hospital makes the right decision"). The algorithm would label it as both fear and trust. "Anticipation" or "trust" are classified as positive emotions, even if they express concern about the event or hope for improvement, rather than comfort or happiness. Many comments contain both positive and negative emotions, and SENA counts both. SENA's "positive/negative" classification is simply an emotion label and does not equate to people's subjective feelings of comfort or happiness.

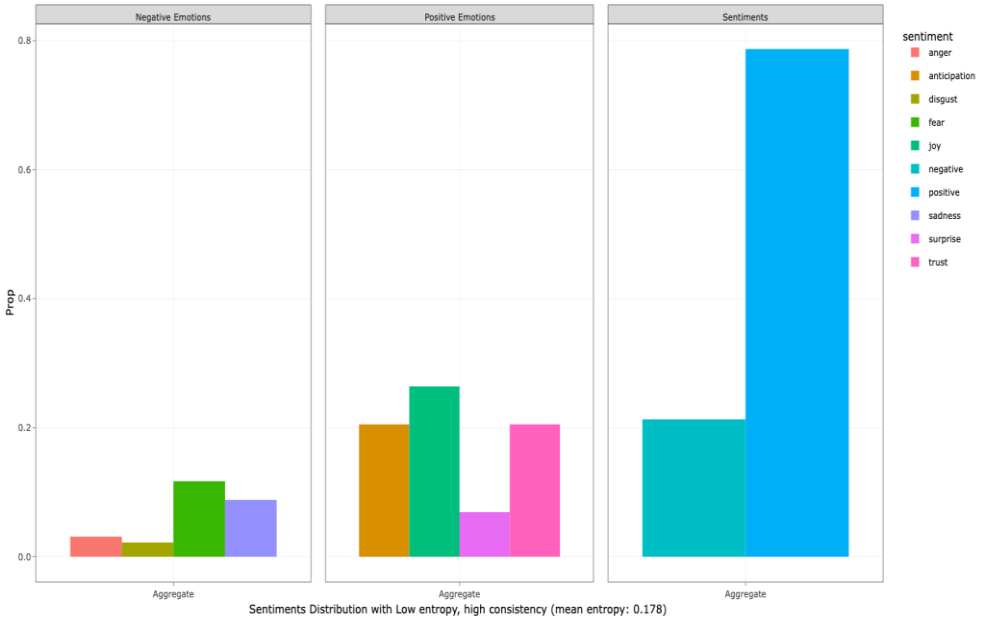

Fig. 2. Analysis of different video release sources for the BDPC case video ABC and people's overall sentiment and emotion analysis of this case

5 Conclusion

5.1 Main Finding

This study conducted a visual analysis of the issue of a brain-dead woman being forced to continue her pregnancy and the implications it raises for health literacy, health communication, and ethics. Key findings are as follows:

Our results indicate that the case of a brain-dead woman continuing her pregnancy has generated significant public response and active discussion. Public concerns regarding women's rights, the responsibilities associated with them, and the financial burdens posed by these issues are often expressed. Differences in health literacy also contribute to varying public attitudes, reflecting inequalities in health communication, with individuals receiving different information and understanding different perspectives on this case.

While this issue has been discussed in earlier studies, it remains intensely debated today, and similar ethically charged events continue to occur. These patterns underscore the need for future efforts to enhance the dissemination of health literacy education, improve the reasonableness of laws and regulations, and foster deeper public understanding of ethical and moral issues, particularly among vulnerable and marginalized populations, thereby helping to bridge the digital divide and better protect the rights and interests of women in vulnerable positions.

5.2 Limitation

Inevitably, this visualization and scientometric study has some inherent limitations. First, it focused solely on YouTube comments, excluding other digital platforms that may have influenced the results due to data accessibility issues. Furthermore, YouTube comment content cannot distinguish personal attributes. Second, it only examined one ethically problematic case—a pregnant woman with brain death, while many other health communication issues influenced by factors such as health literacy, educational background, economic status, age, and communication equity remain underexplored. Future research could expand to platforms such as TikTok and employ mixed methods, combining qualitative analysis of discourse, framing, and emotional expression with quantitative analysis of engagement patterns across demographic characteristics, literacy levels, and socioeconomic backgrounds.

5.3 Further Implications

Future research could broaden the reach to other digital platforms, such as TikTok, and implement mixed methods approaches that combine qualitative analyses of discourse, framing, and emotional expression with quantitative evaluations of participation in different categories of demographic, socioeconomic, and health literacy groups.

Furthermore, the use of artificial intelligence (AI) in clinical practice and communication a promising area for future research. AI systems can help increase diagnostic accuracy, assist in the analysis of medical images, and aid in treatment planning by finding similar recorded patient information. From a communication equity standpoint, multilingual AI tools could enhance the accessibility of culturally appropriate and comprehensible health information for individuals with different levels of health literacy.

However, the benefits of these future advances in medical accuracy and communication accessibility should be weighed against potential ethical concerns such as algorithmic bias, privacy concerns, and potential widening of digital divides. Future research should investigate not only how AI can increase medical accuracy and outreach in communication, but also how these technologies can be implemented in a responsible and ethical manner, ensuring fair, transparent, and inclusive health communication practices across different populations.

Data Availability Statement
The data supporting the findings of this study are available within the article. Further inquiries can be directed to the corresponding author.

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