Cyberbullying in Times of School Shootings: Effects on Youth Mental Health in the U.S.

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Abstract-Online discourse about traumatic events often generates varied forms of audience engagement and potential harassment behaviors. Using text mining and sentiment analysis, this study examined the prevalence and nature of cyberbullying directed at young male and female adults posting about school shootings on TikTok in the U.S. Analysis of 57,837 comments from 60 TikTok videos revealed that non-cyberbullying comments occurred significantly more than expected. Among cyberbullying behaviors, emotional trauma responses dominated interactions with both genders (52.69% of male-directed cyberbullying, 63.97% of female-directed cyberbullying), while aggression, sarcasm, and blame occurred less frequently than anticipated. Notable gendered differences emerged in topic modeling, with males' posts provoking political and threat-related discussions, while females' posts attracted emotionally supportive and healing-focused conversations. Sentiment analysis revealed that posts by young females received more neutral and fewer negative responses compared to those by young males. These findings demonstrate how crisis contexts shape online interactions differently from typical social media environments.

Keywords-cyberbullying, school shootings, TikTok, gender differences, sentiment analysis

I. INTRODUCTION

School shootings represent an unprecedented national crisis in the United States, with 39 incidents recorded in 2024 alone, resulting in 18 deaths and 59 injuries, primarily affecting children and adolescents (Lieberman & Kim, 2024). The United States experiences approximately 87 school shootings annually, far exceeding other nations—a 2018 analysis found 288 U.S. school shootings compared to only eight in Mexico, the country with the second-highest rate (World Population Review, 2025). This alarming frequency occurs within a digital landscape where 90% of American teens use social media platforms, with 60% using TikTok daily and 16% engaging "almost constantly" (Faverio & Sidoti, 2024). During these national crises, the intersection of heightened emotional vulnerability and pervasive digital connectivity creates conditions that amplify cyberbullying behaviors with profound implications for youth mental health and national policy responses.

This digital vulnerability becomes particularly concerning when considering how national crises magnify online harassment behaviors. During times of heightened societal stress, such as school shootings, cyberbullying takes on intensified characteristics that compound the trauma already experienced by young people. Research demonstrates that cyberbullying peaks during middle school years under normal circumstances, with about 33% of students reporting victimization and over 50% witnessing it as bystanders. Those who witness cyberbullying, not just the victims, experience increased levels of internalizing symptoms such as depression and anxiety, indicating that bystanders carry significant mental health burdens as well (Doumas & Midgett, 2020). These baseline effects become amplified during crisis periods when emotional distress is already elevated. The mental health consequences include depression, anxiety, and in severe cases, suicidal ideation, with non-heterosexual orientation youth facing more frequent cyberbullying compared to their heterosexual counterparts. While supportive parenting can mitigate some of these mental health issues, it appears less effective under escalating victimization conditions that often accompany national emergencies (Desmet et al., 2021). Furthermore, cyberbullying victimization becomes intertwined with health-risk behaviors including smoking, drinking, drug use, and risky sexual behaviors, with these correlations being especially significant among female students during periods of heightened stress (Nikolaou, 2022). The SHIELD framework emphasizes resilience and a holistic approach tailored to managing cyberbullying and its adverse mental health effects through empowerment strategies, interventions, and learning processes that engage health professionals and communities (Dailey & Roche, 2025).

The psychological impact of cyberbullying during national crises extends far beyond immediate emotional distress, creating long-term consequences that affect individual development and national well-being. Crisis-amplified cyberbullying is associated with significant negative mental health outcomes, including increased risks of depression, anxiety, self-harm, and suicidal behaviors among children and adolescents (Lee et al., 2025; Kwan et al., 2020; John et al., 2018). The pervasive nature of cyberbullying, which can occur at any

time and reach a wide audience, exacerbates these effects during national emergencies, making it more harmful than traditional bullying (Deol, & Lashai, 2022; Vaillancourt et al., 2017). Specifically, during national crises such as school shootings, the stress and fear experienced by youth amplify the impact of cyberbullying, as these events lead to heightened emotional vulnerability and increased online activity, which in turn raises the risk of cyberbullying exposure (Deol, & Lashai, 2022). The association between cyberbullying victimization and mental health issues is particularly strong among older children and those with pre-existing mental health problems, with males more likely to exhibit behavioral issues and females more likely to experience emotional problems during crisis periods (Lee et al., 2025; Kim et al., 2018). When cyberbullying co-occurs with traditional bullying during national emergencies, it can lead to the most severe psychological outcomes, including poor self-rated mental health and increased suicidal ideation and attempts, especially among middle school students (Sampasa-Kanyinga, 2017). The anonymity and distance provided by digital platforms intensify the cruelty of cyberbullying during crises, making it difficult for victims to escape and for authorities to intervene effectively when resources are already strained (Vaillancourt et al., 2017).

These amplified psychological effects translate into substantial economic implications for national healthcare and educational systems. The Centers for Disease Control reports that youth violence injuries generated $122 billion in economic costs in 2020, representing a 17% increase from the previous year, while bullying victimization nearly doubles the likelihood of anxiety and depression symptoms among teenagers (Haile et al., 2024; CDC, 2024). This economic burden becomes particularly acute during national crises when healthcare systems face increased demand and educational institutions must allocate additional resources to crisis response and mental health support. These findings underscore the urgent need for comprehensive intervention strategies that address both cyberbullying and traditional bullying, focusing on prevention, early detection, and support for affected youth during crisis periods (Wolke et al., 2017; Cassidy et al., 2013). Schools and policymakers are therefore urged to integrate cyberbullying awareness and prevention into broader anti-bullying programs, particularly during times of national crisis, to mitigate these long-term psychological and economic effects (John et al., 2018; Cassidy et al., 2013).

Despite extensive research documenting the general impact of cyberbullying on youth mental health, there remains a significant gap in understanding how national crises such as school shootings affect the tone and prevalence of online harassment directed at young users in the United States on social media, particularly TikTok. Specifically, little is known about how stress during these crises spills over into social media interactions, potentially intensifying negative comment behaviors and exacerbating emotional distress among U.S. youth. This knowledge gap is particularly critical given current federal initiatives including the Kids Online Safety Act, which requires platforms to implement duty of care standards for youth protection, and ongoing Federal Trade Commission investigations into social media companies' inadequate safeguards for children and teens (Kids Online Safety Act, 2023; Federal Trade Commission, 2024). Addressing this gap is crucial for developing timely interventions that protect vulnerable populations during periods of heightened societal tension, thereby supporting public health efforts to safeguard youth mental well-being and informing evidence-based policy responses to digital safety challenges affecting American youth.

Research Questions

1. To what extent do different forms of cyberbullying occur in online content created by youth on TikTok school shootings crises?
    a) What is the extent and style of cyberbullying directed at young males when they post about school shootings in the U.S. on TikTok?
    b) What is the extent and style of cyberbullying directed at young females when they post about school shootings in the U.S. on TikTok?
    c) What are the differences in the style and frequency of cyberbullying directed at young males versus young females' when they post about school shootings in the U.S. on TikTok?
2. What are the most frequently discussed topics related to young males and females when they post about school shootings in the U.S. on TikTok?
3. What is the overall sentiment expressed by users towards young males and females when they post about school shootings in the U.S. on TikTok?

II.   BACKGROUND

The widespread effects of school shootings extend far beyond immediate victims, creating ripple effects that permeate entire educational communities and surrounding regions. Following such events, many adolescents report heightened fears about their safety at school, with some avoiding attendance altogether due to feelings of insecurity (Hodges et al., 2023). Communities surrounding school shootings also experience elevated stress levels, as reflected in a rise in stress-related emergency department visits in nearby areas (Gujral et al., 2023). Moreover, exposure to fatal school shootings is associated with a notable increase in antidepressant use among youth, suggesting significant mental health consequences (Rossin-Slater et al., 2020). High-fatality incidents are particularly harmful, often leading to declines in student attendance and academic performance, as well as long-term health risks such as higher rates of suicide and accidental deaths among survivors (Levine & McKnight, 2024; Rapa et al., 2024). Even indirect exposure, such as participating in lockdown drills

or experiencing threat-induced school closures, has been linked to heightened anxiety, somatic symptoms, and stress-related problems in students (Hullenaar et al., 2025). These community-wide impacts are increasingly recognized as adverse childhood experiences (ACEs), which can contribute to chronic mental health conditions and hinder emotional development (Rajan et al., 2024).

Digital platforms fundamentally alter how crisis information spreads and amplifies community trauma through algorithmic content delivery systems designed to maximize user engagement. Social media algorithms prioritize emotionally provocative and controversial material by focusing on metrics such as likes and shares, creating feedback loops that amplify polarizing narratives during crisis periods (Awasthi, 2025). These algorithms exploit human learning biases by amplifying "PRIME" information—prestigious, in-group, moral, and emotional content—which becomes oversaturated in social media feeds regardless of accuracy or representativeness, particularly during national emergencies (Brady, 2023). This algorithmic amplification intensifies the psychological impact during school shooting events, often exposing teenagers to curated streams of distressing or ideologically skewed material (Arora et al., 2024). One concerning manifestation is the contagion effect, where the likelihood of additional school shootings increases in the weeks following an initial incident, partly driven by the rapid and widespread dissemination of content on social media (Kien et al., 2019; Liu et al., 2022). Research demonstrates that social media plays a prominent role in mass shooting contagion effects, with machine learning models successfully predicting future incidents based on public sentiment patterns on platforms like Twitter (Liu et al., 2022). Social media not only amplifies misleading information but can also normalize harmful behaviors, potentially contributing to copycat acts (Gansner, 2022). The mediatization of school shootings, where media framing and logic shape public discourse, further complicates this dynamic by influencing how events are interpreted and responded to (Muschert, 2012).

The digital information ecosystem during crisis periods creates unique intervention challenges that traditional response mechanisms struggle to address effectively. The existence of tightly connected follower networks within school shooting fan communities increases the potential for rapid dissemination of harmful content, reinforcing ideologies that promote violence and radicalization (Peshkovskaya et al., 2024). This environment facilitates the spread of extremist narratives, especially among adolescents who are developmentally vulnerable to online persuasion and manipulation (Gansner, 2023). Furthermore, extensive media coverage of school shootings amplifies psychological distress, with adolescents exposed to news about high-profile incidents often reporting elevated symptoms of depression and PTSD (Martins et al., 2024). Widespread fear of school shootings collides with algorithms that accelerate the spread of the most outrageous messages, causing chaos across communities as social videos, memes, and retweets become fodder for criminal charges and misinterpretations (Swaby, 2025). The architecture of social media platforms can amplify existing conflict dynamics, exacerbating fault lines and reinforcing destructive patterns of behavior during crisis periods (Stray et al., 2023). These challenges highlight the broader sociopolitical landscape, including the persistent lack of effective regulatory frameworks for digital crisis management, which contributes to the recurrence and amplification of traumatic experiences.

Addressing these multifaceted digital crisis dynamics therefore requires a comprehensive strategy that integrates technological understanding, policy reform, school-based mental health services, and community-level support systems to reduce harm and promote resilience among adolescents (Rencken et al., 2024; Huang & Jiang, 2023).

III.   METHODOLOGY

This study employed a mixed methods approach to analyze online discourse related to school shootings and their emotional impact on adolescent girls in the United States. The study combined qualitative content analysis with text mining to examine the patterns of cyberbullying surrounding school shooting events in the U.S.

Data Collection

Data collection centered on TikTok videos identified through a targeted set of hashtags associated with school shooting incidents, with comments subsequently retrieved using exportcomments.com (https://exportcomments.com/). Eighteen hashtags were used to locate relevant posts: #Uvalde, #Parkland, #SandyHook, #OxfordHighSchool, #Columbine, #RobbElementary, #MarjoryStonemanDouglas, #SchoolShooting, #SchoolShooter, #MassShooting, #GunViolence, #SchoolViolence, #ActiveShooter, #SchoolLockdown, #LockdownDrill, #RunHideFight, #CodeRedDrill, and #ShelterInPlace. These hashtags were selected for their established associations with high-profile school shooting events and for capturing immediate youth discourse on the platform. A purposive sampling strategy was employed to identify videos created by teenagers located in the United States. Teen user accounts were identified through indicators such as bios listing age or grade (e.g., "16 y/o," "Class of 2025"), usernames containing grade-level references, and content depicting high school environments including classrooms, hallways, or pep rallies. Location was further verified through captions or bios referencing U.S. cities, school names, or ZIP codes. Sampling was stratified by account type to include regular teen users with low follower counts, micro-influencers (1,000–10,000 followers), and high-visibility accounts with viral posts. Efforts were made to ensure

geographic, racial, and socioeconomic diversity using both visual and textual cues. Videos containing branded promotions, mainstream news footage, or overt political messaging were excluded to maintain a focus on peer-to-peer interaction and authentic youth-generated content. In total, 60 TikTok videos were collected, evenly divided between adolescent girls (n = 30) and adolescent boys (n = 30). All publicly available comments from these videos were extracted for analysis, producing 42,410 comments on boys' videos and 15,427 comments on girls' videos.

Codebook Development

An inductive coding approach was employed using NVivo (version 24) to manually analyze 2,000 user comments from TikTok videos related to school shootings. This approach enabled themes and patterns to emerge directly from the data rather than relying on predefined categories. Coding began with open coding, where comments were reviewed line by line and initial codes were assigned to capture significant phrases, expressions, or emotional tones reflective of users' language and meaning. Similar or overlapping codes were then consolidated and refined into broader thematic categories through iterative rounds of review. This recursive process supported the development of nuanced themes representing adolescents' experiences of cyberbullying and their emotional responses following national crises. Coding labels and definitions were continually refined to maintain alignment with the data and contextual relevance. To ensure reliability, two independent coders conducted the analysis and achieved an interrater agreement of 91%. Table 1 presents an overview of the identified cyberbullying behaviors. This qualitative coding framework provided the basis for subsequent large-scale text mining using R, allowing for systematic analysis of response patterns across 42,410 boys' and 15,427 girls' user comments.

Theme	Definition	Example Comment (TikTok)
Aggression	Direct or hostile language intended to provoke, threaten, or demean others.	"Y'all deserve this if you keep voting that way" "Shut up and die already"
Fear	Expressions of anxiety, panic, or helplessness related to shootings or safety.	"I'm scared to go to school tomorrow" "My chest hurts watching this"
Sarcasm	Mocking or backhanded remarks that minimize emotional posts or pain.	"So dramatic 💀" "And the Oscar goes to…"
Blame	Assigning fault to individuals, groups, or systems for the violence or outcome.	"This is all y'all's fault for making everything political" "Maybe stop glorifying shooters"
Emotional Trauma	Sharing of personal or secondhand trauma, or emotionally raw reactions.	"I was in a lockdown last semester and I still cry" "My brother was in the hallway when it happened"

Table 1. Codebook

IV.   DATA ANALYSIS

Keyword Matching

Data preprocessing was conducted using the R packages dplyr (Wickham et al., 2023) and stringr (Wickham, 2022). Each comment in the dataset was assigned a unique identifier using the row_number() function to enable systematic tracking and organization. To classify comments, regular expressions were applied to detect specific word patterns and phrases associated with cyberbullying behaviors following national crises. The keyword lists for classification were derived directly from the inductive qualitative analysis described above, ensuring that computational categorization reflected the actual language and expressions used by TikTok users in the context of school shootings. A rule-based classification system was developed to categorize comments into five thematic groups: Aggression, Fear, Sarcasm, Blame, and Emotional Trauma. This classification was carried out using the case_when() function combined with str_detect() in R, allowing sequential evaluation of each comment against predefined keyword lists. Comments were assigned to the first matching category identified, while those that did not fit any category were labeled as Uncategorized. This data-driven approach ensured that computational text mining remained grounded in user-generated language patterns identified through systematic qualitative analysis, providing both methodological rigor and contextual validity. The rule-based method offered a reliable and scalable way to identify and quantify distinct types of harmful messages within the datasets, forming the basis for further quantitative analysis of comment tone and cyberbullying prevalence following school shooting events.

Category	Selected Keywords/Phrases

Aggression	womp womp, cringe, skill issue, darwin awards, natural selection, deserved it, play stupid games, fafo, get rekt, L bozo, ratio, cope harder, touch grass, no cap fr, big yikes, based take, smoothbrain, absolute unit, main character syndrome, npc behavior, reddit moment, average american, only in america, america moment, florida man, certified bruh moment
Fear	I'm scared, terrified, anxiety, ptsd, trauma, nightmares, panic attacks, can't sleep, shaking, heart racing, paranoid, hypervigilant, triggered, flashbacks, constant worry, feel unsafe, looking over shoulder, afraid to go to school, scared for my kids, living in fear, mental breakdown, emotional damage, psychological scars, survivor guilt, trust issues, feeling helpless
Sarcasm	thoughts and prayers, wow so helpful, great job america, this is fine, totally normal, just another day, amazing leadership, perfect system, real progress, such protection, brilliant response, working as intended, mission accomplished, problem solved, what could go wrong, totally safe, very effective, outstanding work, job well done, flawless execution, peak performance, textbook response, exemplary handling, stellar management, top tier response, magnificent effort
Blame	government failed, politicians fault, system broken, failed leadership, policy failure, where were police, useless cops, corrupt officials, media circus, gun lobby, nra blood money, weak laws, incompetent response, negligent security, institutional failure, administrative incompetence, regulatory capture, political theater, systemic dysfunction, leadership vacuum, accountability crisis, governance failure, oversight neglect, preventable tragedy, avoidable catastrophe, foreseeable disaster
Emotional Trauma	heartbroken, devastated, crying, tears, grief, mourning, anguish, despair, sorrow, pain, hurt, broken, shattered, crushed, overwhelmed, numb, empty, lost, confused, angry, frustrated, helpless, hopeless, betrayed, abandoned, isolated, disconnected, misunderstood, invalidated, dismissed, silenced, ignored, forgotten, failed, let down, disappointed, disillusioned

Table 2. Keyword matching

Sentiment Analysis

Sentiment analysis was conducted separately on TikTok comment datasets from boys and girls in relation to school shootings. The boys' dataset comprised 42,410 comments, while the girls' dataset contained 15,427 comments. All preprocessing and analyses were performed in R (R Core Team, 2023). Comments were tokenized into lowercase words using the unnest_tokens() function from the tidytext package (Silge & Robinson, 2016). Common English stop words such as "the," "and," and "is" were removed to concentrate on semantically relevant terms. Sentiment classification applied the Bing Liu lexicon (Hu & Liu, 2004), which labels individual words as positive or negative. Tokenized words were matched to the lexicon through inner joins to identify sentiment-bearing language. Sentiment for each comment was determined by comparing the proportion of positive to negative words, classifying comments as positive, negative, or neutral. Following established conventions, comments with equal positive and negative word counts were categorized as neutral, while comments with a greater number of positive words were classified as positive, and those with more negative words as negative (10e, 2018, August 10). This method reflects standard practices in sentiment analysis, where neutral serves as the baseline for non-polarized content (Wikipedia contributors, 2025, July 26). The three-tier classification system (positive, negative, neutral) is widely used in sentiment research, allowing clear differentiation of emotional valence while accounting for neutral expressions (Nandwani & Verma, 2021). A word cloud was generated to highlight prominent vocabulary patterns within the dataset. Finally, sentiment distribution was examined through bar charts depicting the proportion of comments in each sentiment category, providing insight into the emotional tone of user reactions following school shooting incidents.

Topic Modeling

Latent Dirichlet Allocation (LDA) topic modeling was applied to TikTok comment datasets from adolescent boys and girls to uncover latent thematic structures related to cyberbullying and emotional responses following school shootings. The analysis included 42,410 comments from boys' videos and 15,427 comments from girls' videos. Data preprocessing was conducted using R (R Core Team, 2023) with the tm package (Feinerer & Meyer, 2008). Comments were cleaned by converting text to lowercase, removing punctuation, numbers, common English stop words, and extra whitespace. Comments lacking meaningful content after preprocessing were excluded to ensure data quality. Document-Term Matrices (DTMs) were created for each gender-specific dataset to represent word frequency distributions. Separate LDA models were estimated for boys' and girls' comments using the topicmodels package (Grün & Hornik, 2011). The number of topics was set to five, determined through evaluation of perplexity and topic coherence scores—standard metrics balancing interpretability with model fit (Gan & Qi, 2021; Zhao et al., 2015). This approach aligns with best practices in topic modeling, where researchers test various topic counts to optimize clarity and separation of themes (Zhao et al., 2015). Five topics provided stable and well-defined thematic groupings suitable for the dataset size and complexity (Gan & Qi, 2021). To ensure reproducibility, fixed random seed settings were used throughout the modeling process. The top ten terms with the highest probability weights (β values) were

extracted for each topic to aid interpretation. Visualizations of topic-term associations were generated using ggplot2 (Wickham, 2016), illustrating key lexical themes and revealing distinct patterns in cyberbullying and emotional expression directed at adolescent users in the aftermath of school shooting events.

V.   FINDINGS

1. To what extent do different forms of cyberbullying occur in online content created by youth on TikTok school shootings crises?

a) What is the extent and style of cyberbullying directed at young males when they post about school shootings in the U.S. on TikTok?

On TikTok, significantly more non-cyberbullying comments on posts about school shootings by young males were found than cyberbullying comments, χ^2 (1, N = 42,410) = 36,070, p < .001. Emotional trauma was the most common tactic (52.69% of all cyberbullying comments), followed by fear (26.19%), aggression (17.22%), sarcasm (3.84%), and blame (0.06%). A chi-square test of independence was performed to examine the relationship between the different cyberbullying tactics. The results were statistically significant, χ^2 (4, N = 1,649) = 1,463.22, p < .001, with significantly more emotional trauma tactics and significantly less sarcasm and blame than the other cyberbullying tactics. Based on the adjusted standardized residuals with critical value ±1.96, emotional trauma was used significantly more on TikTok than expected, while sarcasm and blame were used significantly less than expected.

Table 3. The extent and style of cyberbullying directed at young males.

Tactic	Non-cyberbullying		Cyberbullying			X^2	df	N	p
	#	%	#	%	Adjusted standardized residuals				
Emotional Trauma			869	52.69	29.69	1,463.22	4	1,649	< 0.001
Fear			432	26.19	5.63				
Aggression			284	17.22	-2.52				
Sarcasm			63	3.84	-14.69				
Blame			1	0.06	-18.11				
Total	40,761	96.11	1,649	3.89		36,070	1	42,410	< 0.001

a) What is the extent and style of cyberbullying directed at young females when they post about school shootings in the U.S. on TikTok?

On TikTok, significantly more non-cyberbullying comments on posts about school shootings by young females were found than cyberbullying comments, χ^2 (1, N = 15,427) = 10,909.36, p < .001. Emotional trauma was the most common cyberbullying tactic (63.97% of all cyberbullying comments), followed by fear (25.99%), aggression (8.16%), sarcasm (1.55%), and blame (0.33%). A chi-square test of independence was performed to examine the relationship between the different cyberbullying tactics. The results were statistically significant, χ^2 (4, N = 1,227) = 1,741.06, p < .001, with significantly more emotional trauma tactics and significantly less aggression, sarcasm, and blame than the other cyberbullying tactics. Based on the adjusted standardized residuals with critical value ±1.96, emotional trauma was used significantly more on TikTok than expected, while aggression, sarcasm, and blame were used significantly less than expected.

Tactic	Non-cyberbullying		Cyberbullying			X^2	df	N	p
	#	%	#	%	Adjusted standardized residuals				
Emotional Trauma			785	63.97	34.44	1,741.06	4	1,227	< 0.001

Fear			319	25.99	4.69				
Aggression			100	8.16	-9.28				
Sarcasm			19	1.55	-14.45				
Blame			4	0.33	-15.41				
Total	14,200	92.05	1,227	7.95		10,909.36	1	15,427	< 0.001

Table 4. The extent and style of cyberbullying directed at young females.

c) *What are the differences in the style and frequency of cyberbullying directed at young males versus young females' when they post about school shootings in the U.S. on TikTok?*

On TikTok, significant differences were found in the style and frequency of cyberbullying directed at young males versus young females when they post about school shootings, $\chi^2(5, N = 2,876) = 74.52$, $p < .001$. Young males experienced significantly more cyberbullying overall than young females, $\chi^2 (1, N = 2,876) = 880.33$, $p < .001$. Emotional trauma was the most common cyberbullying tactic directed at both groups, with young males receiving 30.22% of all emotional trauma comments and young females receiving 27.27%. Fear-based cyberbullying represented 15.02% of comments directed at young males compared to 11.09% directed at young females. Aggression tactics comprised 9.87% of cyberbullying toward young males and 3.42% toward young females. Sarcasm accounted for 2.19% of cyberbullying directed at young males versus 0.66% directed at young females. Blame tactics represented the smallest category, with 0.03% directed at young males and 0.16% directed at young females. Based on the adjusted standardized residuals with critical value ±1.96, young males experienced significantly more emotional trauma and fear-based cyberbullying than expected, while young females also experienced significantly more emotional trauma and fear-based cyberbullying than expected. Both groups experienced significantly less aggression, sarcasm, and blame tactics than expected.

Tactic	Platform						X^2	df	N	P
							74.52	5	2876	< 0.001
	Boys			Girls						
	(#)	(%)	Adjusted standardized residuals	(#)	(%)	Adjusted standardized residuals				
Emotional Trauma	869	30.22	29.69	785	27.27	34.44				
Fear	432	15.02	5.63	319	11.09	4.69				
Aggression	284	9.87	-2.52	100	3.42	-9.28				
Sarcasm	63	2.19	-14.69	19	0.66	-14.45				
Blame	1	0.03	-18.11	4	0.16	-15.41				
Total	1,649			1,227			880.33	1	2,876	< 0.001

Table 5. Differences in the style of cyberbullying towards posts by young males and females

2. What are the most frequently discussed topics related to young males and females when they post about school shootings in the U.S. on TikTok?

The analysis revealed that the most frequently discussed topics related to young males and females when they post about school shootings in the U.S. on TikTok differed significantly between genders. When young males posted about school shootings, five distinct topics emerged: Political Discourse dominated discussions with conversations about policy and systemic issues surrounding gun violence. Peer Support reflected efforts to provide comfort and solidarity among users. Grief Expression represented emotional responses and mourning processes following tragic events. Disinformation Spread captured discussions involving false information and conspiracy theories. Threat Discussion focused on conversations about potential dangers and security concerns. When young females posted about school shootings, five different topics were identified: Personal Grief emerged as individual emotional responses and personal loss experiences. Community Support reflected collective efforts to provide assistance and comfort to affected individuals. Tragedy

Response encompassed immediate reactions and coping mechanisms following shooting incidents. Emotional Processing represented discussions about managing and understanding complex feelings related to these events. Healing Discourse focused on conversations about recovery, resilience, and moving forward after traumatic experiences. These findings demonstrate distinct gendered patterns in how audiences respond to school shooting content, with males' posts generating more political and threat-focused discussions, while females' posts elicited more emotionally supportive and healing-oriented conversations.
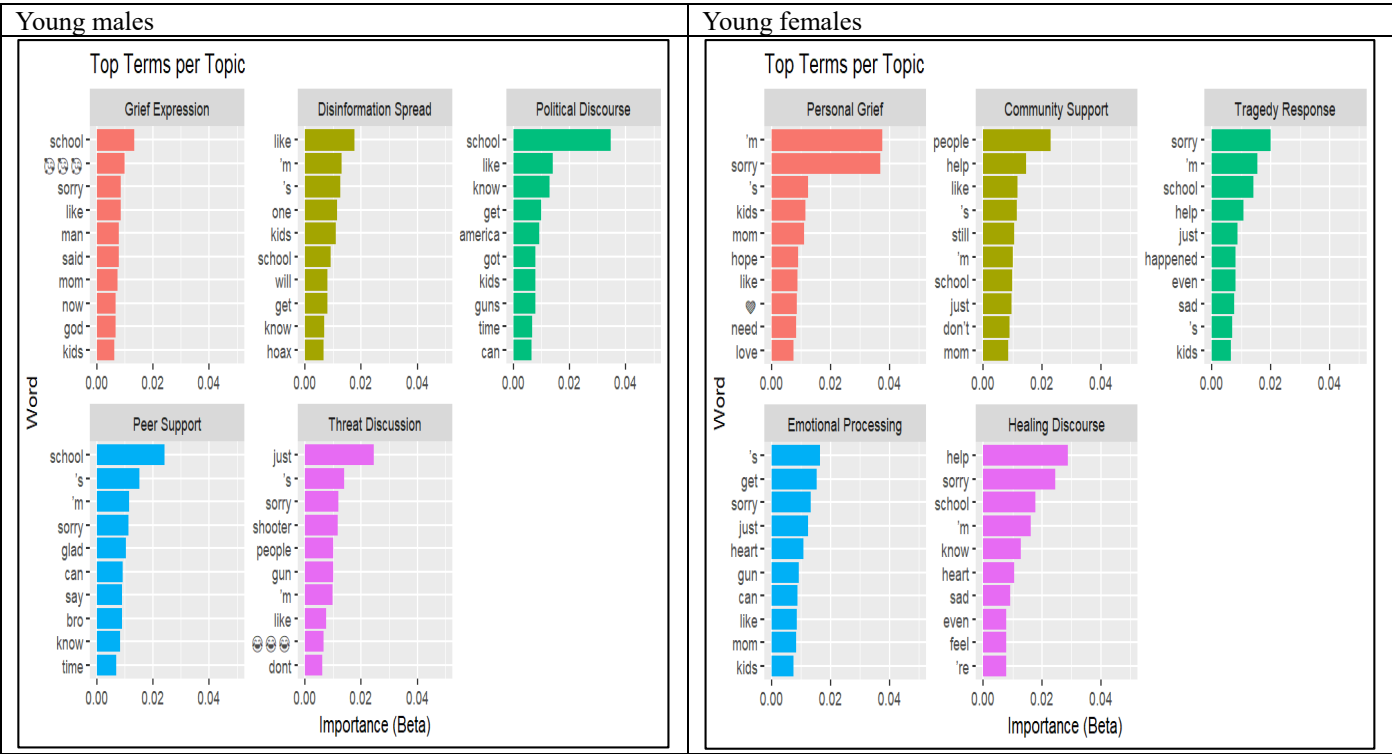

Figure 1. Topics from posts by the groups

3. What is the overall sentiment expressed by users towards young males and females when they post about school shootings in the U.S. on TikTok?

The sentiment analysis revealed clear patterns in how users responded to young males and females who posted about school shootings in the U.S. on TikTok. For male users, neutral sentiment appeared most frequently, followed by negative sentiment, with positive sentiment being the least common. A similar pattern emerged for female users, with neutral responses being the most common, followed by negative, and then positive sentiment. However, a comparison between the two groups showed that posts by young females received a higher proportion of neutral responses and fewer negative reactions than those by young males. These results suggest a gendered difference in audience reception, with female users encountering less negativity and more neutral engagement than their male counterparts.

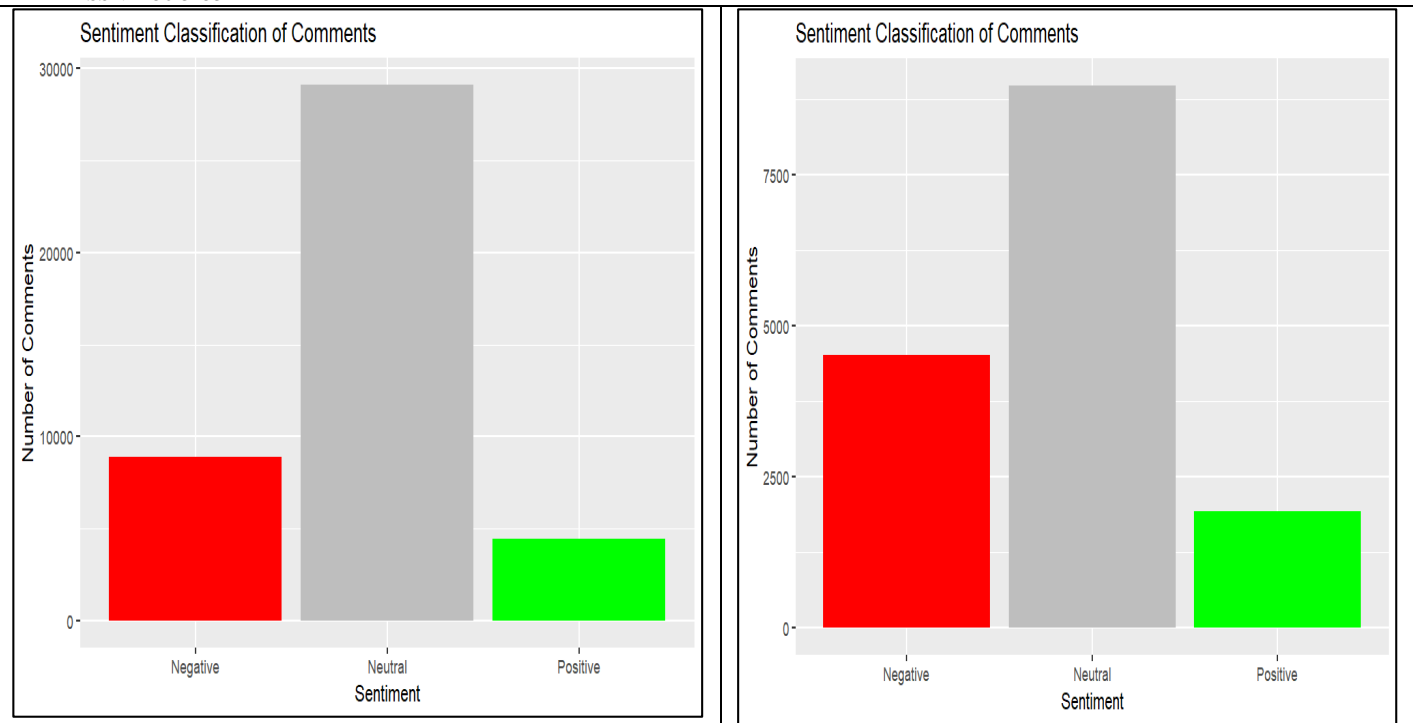| Young males	Young females

Figure 2. Sentiment Analysis

VI.   DISCUSSION

This section begins by comparing differences in both the extent and style of cyberbullying comments directed at young male and female adults when they post about school shootings in the U.S. on TikTok. It then outlines the findings from the sentiment analysis and highlights the main themes identified in user comments. On TikTok, posts about school shootings by young males and females attracted far more non-cyberbullying comments than cyberbullying ones. This pattern may be partly explained by the platform's moderation practices. Proactive measures, including automated detection and human review, have been shown to limit the visibility of harmful content (Gillespie, 2018), and TikTok's enforcement of its community guidelines likely removes a portion of cyberbullying before it appears publicly. Emotional trauma was used significantly more often toward young male and female adults posting about school shootings in the U.S. on TikTok than anticipated, whereas aggression, sarcasm, and blame appeared significantly less frequently than expected. The nature of the topic plays a key role, as school shootings are widely recognized as deeply traumatic events that tend to elicit expressions of grief, fear, or solidarity rather than hostility, reflecting an implicit social norm to respond empathetically (Lin & Margolin, 2014). Audience composition may shape interaction tone. Creators addressing school shootings may have follower networks with shared values or similar life experiences, fostering more supportive exchanges (Shen et al., 2014).

These factors could explain why emotional trauma is more frequently expressed, while aggressive, sarcastic, and blaming comments are less common in this context. The findings revealed clear gendered differences in audience responses to school shooting content: posts by males tended to provoke more political and threat-related discussions, whereas posts by females attracted more emotionally supportive and healing-focused conversations. Gender differences in social media interactions have been widely documented, with motivations and behaviors often linked to gender identity and related ideologies (Dahlke & Zhang, 2023; Fichman & Amidu, 2024; Fichman & Amidu, 2025). Research on educational social media platforms has also identified notable gender disparities, showing that males and females engage in distinct ways, which corresponds with the gendered audience responses observed in discussions about school shootings (Theophilou et al., 2023). Specifically, females tend to use social media for emotional bonding and social compensation, while males are more likely to engage in competitive bonding behaviors (Manago et al., 2023). These differences help explain why posts by females and males on school shooting topics elicit varied types of responses. For both male and female users, neutral sentiment was most common, followed by negative, with positive sentiment least frequent. However, posts by young females received more neutral and fewer negative responses compared to those by young males. This difference may be related to how males

and females frame their social media posts. Women often use more emotionally expressive language and draw on personal experiences, fostering intimate discussions that create supportive, community-oriented spaces (Elmahdi et al., 2024). Research also shows that posts framed around gain or neutral outcomes, rather than loss, tend to build greater trust and more positive attitudes among online audiences (Hou & Kankham, 2023). These framing strategies likely encourage mutual understanding and reduce polarizing debates, which may help explain why female users receive more neutral and less negative engagement, especially in the often contentious environment of social media. Building on these findings, the following section outlines key policy implications that can guide federal platform regulation, national youth protection initiatives, and targeted prevention strategies to address cyberbullying during national crises within social media environments.

Policy Implications and National Relevance

This research demonstrates substantial alignment with current federal initiatives targeting youth digital safety and cyberbullying prevention. Most significantly, the study's documentation that emotional trauma constitutes the predominant cyberbullying response during school shooting crises (52.69% for males, 63.97% for females) directly supports implementation of the Kids Online Safety Act's duty of care framework. Under KOSA's provisions, social media platforms must "exercise reasonable care in the creation and implementation of any design feature to prevent and mitigate" specific psychological harms to minors, including anxiety, depression, and suicidal behaviors—precisely the categories identified in this research (Kids Online Safety Act, 2023; Blumenthal, n.d.). This legislative foundation enables the Federal Trade Commission to leverage these findings for strengthening ongoing enforcement actions against social media companies. The September 2024 FTC report "A Look Behind the Screens" documented how major platforms engaged in "vast surveillance of users with lax privacy controls and inadequate safeguards for kids and teens" (Federal Trade Commission, 2024). This study's quantitative evidence of gendered harassment patterns provides the FTC with specific metrics to evaluate platform compliance and measure the effectiveness of implemented youth protections during crisis periods. The research aligns with the Surgeon General's 2023 Advisory recommendation for evidence-based research into how platform features affect adolescent mental health, particularly given that 95% of youth ages 13-17 use social media platforms, with over one-third engaging "almost constantly" (U.S. Public Health Service, 2023). This scientific foundation supports targeted intervention strategies with significant economic implications for national healthcare and educational systems. The Centers for Disease Control and Prevention has established that bullying victimization nearly doubles the likelihood of anxiety (29.8%) and depression (28.5%) symptoms among teenagers compared to non-bullied peers (Haile et al., 2024). Given that youth violence injuries alone generated $122 billion in economic costs during 2020—a 17% increase from the previous year—maintaining the low cyberbullying rates documented in this study (3.89% for males, 7.95% for females) during school shooting crises could prevent substantial healthcare expenditure escalation (CDC, 2024). The research methodology enables precision approaches that focus resources on the small percentage of interactions constituting actual cyberbullying rather than broad-spectrum monitoring, creating cost-effective intervention strategies. These evidence-based approaches translate directly into operational implementation through federal school safety protocols. The documented patterns—males experiencing more political and threat-focused discussions while females receive emotionally supportive conversations—inform the Department of Education's school safety guidelines available through SchoolSafety.gov (Schoolsafety.gov, n.d.). This platform-specific intelligence enables more precise resource allocation during crisis periods, supporting the Department's mandate to provide schools with actionable recommendations for creating safe learning environments. Federal requirements under the Elementary and Secondary Education Act mandate that schools develop crisis response protocols, and this research provides an evidence-based framework for incorporating digital safety monitoring into existing emergency management systems (U.S. Department of Education, n.d.). The multi-agency coordination extends these capabilities across the federal landscape, with the CDC's Violence Prevention initiatives gaining improved monitoring tools for tracking digital harassment as an Adverse Childhood Experience while supporting real-time crisis response during national emergencies (CDC, 2024). The Department of Homeland Security's cybersecurity efforts benefit from evidence-based frameworks for identifying online threat amplification during national security incidents, while the National Institute of Mental Health can utilize the gendered harassment patterns to design targeted digital interventions that account for differential vulnerability during crisis periods. The FBI's Internet Crime Complaint Center gains enhanced capability for prioritizing intervention resources and identifying escalating threats based on the study's classification system. This comprehensive federal applicability demonstrates the research's substantial contribution to national interests in youth safety, crisis management, and evidence-based policy development across multiple government sectors.

VII.   LIMITATION

Using proxy age indicators instead of verified documentation may introduce sampling bias, which could limit the generalizability of the findings. Furthermore, The keyword-based classification method, although rooted in qualitative analysis, might have overlooked more nuanced forms of harassment that lack overt language.

VIII.   CONCLUSION

This study addresses a gap in the literature on cyberbullying comments directed at young adults posting about school shootings on TikTok in times of crisis. This study is significant because it examines a largely underexplored intersection of gender, crisis communication, and platform specific harassment dynamics during traumatic events. By focusing on cyberbullying responses to school shooting content posted by young males and females on TikTok, it reveals how crisis-related discourse, algorithmic visibility, and gendered user behaviors interact during periods of national trauma. These insights can guide targeted interventions, crisis-informed moderation policies, and digital literacy efforts for youth navigating mental health challenges during school shooting incidents. On TikTok, posts about school shootings by young males and females attracted far more non-cyberbullying comments than cyberbullying ones. Emotional trauma was used significantly more often toward young male and female adults posting about school shootings in the U.S. on TikTok than anticipated, whereas aggression, sarcasm, and blame appeared significantly less frequently than expected. The findings revealed clear gendered differences in audience responses to school shooting content: posts by males tended to provoke more political and threat-related discussions, whereas posts by females attracted more emotionally supportive and healing-focused conversations. Posts by young females received more neutral and fewer negative responses compared to those by young males.

Future research should investigate how various forms of cyberbullying in response to school shooting content affect young adults' mental health over time. Longitudinal studies tracking changes in anxiety, depression, and trauma symptoms could clarify how online harassment adds to the psychological impact of crisis exposure. Additionally, research could examine how cultural and regional differences within U.S. communities influence patterns of crisis-related cyberbullying and gendered responses across different social media platforms such as Instagram, Twitter, and Snapchat. This would help identify platform-specific risks and inform the development of targeted interventions.

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