Is violence escalation the consequence of art vandalism, road blockades, and assaults for the cause of climate change mitigation?

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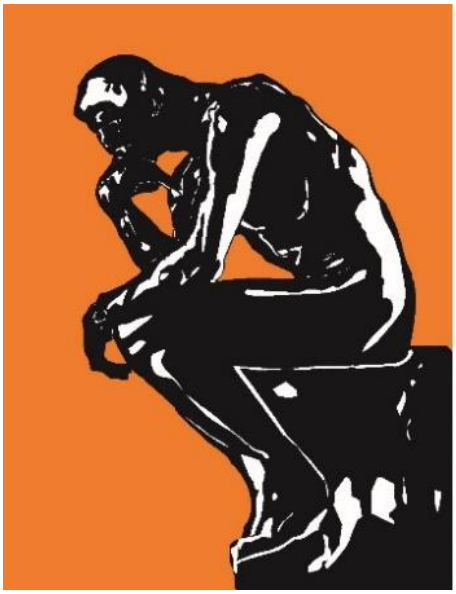

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"It is difficult to have a grasp of philosophy in life. Well, because everyone knows only bits here and there. And generalization would likely end up false. Such bad philosophizing in the bird village has brought harm to numerous birds."

—In "The Philosopher Bird"; *The Kingfisher Story Collection* (2022a)

Abstract

Environmental activism is expected to improve society's well-being and environmental sustainability. Nevertheless, some inappropriate ways of activism, like road blockage, art vandalism, assaults, etc., have been recently conducted and risked causing adverse repercussions, including violence escalation. The current study aims to explore which types of environmental activism are more likely to escalate violence between activists, affected citizens, and police. Bayesian Mindsponge Framework (BMF) analytics was employed to analyze a dataset of 89 blockage, vandalism, and harassment cases in 13 countries in this exploratory study. We discovered that rallies and demonstrations, marches, event disruption, and art vandalism were less likely to escalate violence between protestors, other citizens, and the police. In contrast, road blockades and assaults are more likely to lead to violence escalation. Apart from those, sabotage was found to have an ambiguous relationship with the violence escalation. Based on these results, we suggest that climate activists should be more selective in adopting activism approaches to raise public awareness and support and avoid using tactics that might be counterproductive and reduce public backing, such as road blockage and assaults. Despite the negative impact of art vandalism on violence escalation, we also discussed why art vandalism should not be used since it can curb the effectiveness of artivism, showing misuse of artworks (e.g., paintings, music, films) for environmental activism.

Keywords: climate activism; art vandalism; road blockage; assault; radical approach; violence; police; eco-surplus culture

1. Introduction

Although 2023 was the warmest year since the beginning of the global record in 2023, the global energy-related CO2 emissions continued to reach record highs in the same year with a 1.1% increase and saw no peak in sight (International Energy Agency, 2024; National Centers for Environmental Information, 2024). As the global temperature increases, the climate system will cross the tipping points that can lead to large, abrupt, and often irreversible changes and cause severe impacts on human society and other life forms on Earth (Armstrong McKay et al., 2022; Lenton, 2021; Lenton et al., 2019). Under such a scenario, climate movement is crucial for raising public awareness of climate risks and pushing for economic and political shifts towards climate change mitigation resolutions.

Climate activism has gained significant momentum since the late 1980s and early 1990s, especially after the Copenhagen Summit in 2009 and the Paris Agreement 2016 (Hadden, 2015; Maher, 2021).

One of the most prominent climate movements after the Paris Agreement was the School Strike for Climate (a.k.a. Fridays for Future and Youth for Climate), initiated by the Swedish teenager Greta Thunberg. By protesting outside the Swedish Parliament during school hours to demand the government reduce carbon emissions per the Paris Agreement (Maher, 2021), Thunberg inspired millions of youths worldwide to call for urgent intervention against climate change. Her months of school strikes lead to a chain reaction of school strikes every Friday around the world and the September 2019 climate strikes (a.k.a. Global Week for Future). The September 2019 climate strikes were considered the largest climate strikes in world history, with the participation of an estimated 7.6 million people from over 185 countries (Della Porta & Portos, 2023).

Such activism movements have resulted in various outcomes on climate change mitigation, both directly and indirectly. Some environmental movements concentrate on promoting behavior change within the communities (e.g., car-use and flying frequency reduction, usage of nonfossil fuel-based sources of electricity, lowering dairy or meat consumption, etc.) and achieve several positive effects (Fisher & Nasrin, 2021). A study of 72 households in southern England found that low household electricity use is associated with households sharing pro-environmental attitudes and contacting environmental organizations (Saunders, Büchs, Papafragkou, Wallbridge, & Smith, 2016). Another longitudinal ethnographic research of people participating in environmental campaigns in Sweden showed that participants reduced their usage of plastic and consumption of meat throughout the study (Vestergren, Drury, & Chiriac, 2018; Vestergren, Drury, & Hammar Chiriac, 2019).

Apart from the behavioral changes, some environmental movements also aim to pressure the political and economic actors to alter their actions and/or expedite their endeavors to decrease greenhouse gas emissions. Movements in this regard can be classified into four main types based on their tactics (Fisher & Nasrin, 2021):

1. Activism through litigation
2. Activism targeting business actors
3. Activism through collaboration with the political systems
4. Activism outside the economic and political systems

While the first three types of activism tend to capitalize on the existing political and economic structures to promote changes, the fourth type mainly utilizes tactics outside the existing political and economic systems. Specifically, the first type of activism aims to use judicial efforts to take action or enforce existing legislation (McCormick et al., 2017; Peel & Lin, 2019; Peel & Osofsky, 2020); the second type employs shareholder activism and cooperative board stewardship to pressure the businesses to change their activities and performance (Bratton & McCahery, 2015; Gillan & Starks, 2007); the third activism approach entails advocating to elected representatives or endeavoring to modify political representation through the democratic process of electing candidates (Schlozman, Verba, & Brady, 2012).

In contrast, the participants employing the fourth type of activism usually employ confrontational tactics that challenge the existing economic and political systems, such as boycotting, striking, protesting, and other direct actions. Studies on the effects of this type of activism tend to draw contentious conclusions. By studying the relative impact of pro-environmental mobilization on GHG emissions in the United States (US), Munoz discovered that CO2 emissions declined in states with more pro-environmental protests (Muñoz, Olzak, & Soule, 2018). However, a study of over 12,000 environmental bills from 1973-1996 in the US found no effect of protest on the speed of the bill's passage (Olzak, Soule, Coddou, & Muñoz, 2016).

Despite such inconsistency, climate strikes and protests have been proven useful in raising public awareness about climate change. A prime example is the climate change protest started by Greta Thunberg. Such strikes and protests even mobilize the youth to participate in direct and indirect efforts to promote social transitions toward a more resilient future against climate change. Based on Twitter data from 2014 to 2021, Nisbett found that normative frameworks pushed forward by youth climate activists have successfully permeated the public climate change discourse around the annual United Nations Framework Convention on Climate Change (UNFCCC) conferences and received support from journalists, researchers and research institutions, UN bodies and officials, and even some industry sectors (Nisbett & Spaiser, 2023). A subsequent study by Valentim (2023) even found that exposure to Fridays for Future protests raises the vote share of the Green Parties in Germany, and repeated exposure intensifies the effect.

Nevertheless, in the rise of the climate activism movement, different groups backing radical approaches that advocate using vandalism tactics to achieve

their main objectives also emerged. Actions conducted by these groups encompass a range of activities, including but not limited to vandalism of valuable artworks created by internationally acclaimed artists, obstructing traffic during peak hours, and intimidating business owners and managers (Alao, 2022; Grieshaber, 2023). While the effects of such activities on climate change mitigation remain debatable, they risk creating adverse consequences and diminishing public backing for the environmental movement. One such risk is violence escalation. Although the media have covered events that led to the violent escalation of blockade, vandalism, and harassment activities for the cause of climate change mitigation, there is a lack of scientific study to validate this negative effect.

As a result, this study aims to fill in this gap by examining the kinds of environmental activism that can lead to violence escalation. For this exploratory purpose, Bayesian Mindsponge Framework (BMF) analytics was employed to analyze a dataset of 89 blockage, vandalism, and harassment cases in 13 countries. Specifically, Bayesian inference was utilized to examine the relationships between the types of demonstrations and whether they result in violent outcomes (Nguyen, La, Le, & Vuong, 2022; Q.-H. Vuong, Nguyen, & La, 2022, 2024). Eventually, the Mindsponge Theory will be employed to provide reasoning through the information-processing lens for the estimated results (Q.-H. Vuong, 2023).

2. Methodology

2.1. Model construction

2.1.1. Variable selection

The current study employed a dataset of metadata of 89 blockade, vandalism, and harassment events happening in 13 countries in recent years. There were two main stages in creating the dataset: 1) identifying the event and 2) recording the event's metadata (Q.-H. Vuong et al., 2024).

In the first stage, we employed a thorough approach using a variety of data collection methods from public information sources, social media, and press releases to identify blockade, vandalism, and harassment events carried out by environmental activist groups. It includes four steps.

Step 1 defines the scope and keywords for online search (see Table 1). We intentionally covered a spectrum of terms ranging from broad concepts representing common environmental activist activities to more detailed terms

outlining various types of events or actions. Our keyword organization was tailored for targeted searches, aligning specific terms with known activist groups and particular environmental issues to focus on relevant protests. We also employed location- and date-specific keywords to refine searches and enhance their relevance. Initially, we derived keywords from articles highlighting significant events trending in the media. These were continually evaluated and refined based on new articles, with additional keywords generated using tools like ChatGPT, informed by previously gathered information.

Table 1: Keyword groups used for searching

Keyword groups	**Description**	**Examples**
Basic keywords	Covering common terms related to types of environmentally-related activities, protests driven by environmental concerns, and climate change activism	Climate protest, climate activist, environmental activism, climate change demonstration, eco-protest, etc.
Action-specific keywords	Describing events such as blockades, property damage, or targeting of individuals or organizations by activists.	Road blockades, infrastructure vandalism, construction site occupation, fire setting in protest, etc.
Representative group keywords	Identifying specific environmental activist organizations known for such activities	Extinction Rebellion (XR), Letzte Generation, Greenpeace, Stop Fracking Around, Earth Uprisings (Les Soulèvements de la Terre), etc.
Issue-specific keywords	Addressing particular environmental issues protested, aiding in	Fossil fuel exploration protest, motorway project

	narrowing down relevant events	opposition, reservoir project protest, agricultural land preservation, etc.

Subsequently, we utilized three main channels based on our predetermined keywords to collect the event data: 1) public media, 2) social media, and 3) press releases and reports. The data collection was stopped when it reached the saturation point. After collecting the data, we stored them in a database systematically organized with fields for the date, location, type of event, related groups, a detailed description, and the source of information. Finally, the event data were verified to ensure the reliability and legal compliance of information sources by evaluating source credibility, checking the affiliations of the sources, cross-referencing the information, and using fact-checking websites.

In the second stage, we created a questionnaire to gather metadata from our collected information sources, primarily sourcing news from reputable outlets known for their credibility and thorough reporting. The questionnaire's structure was guided by the Mindsponge Theory, a theory derived from the mindsponge mechanism, a socio-psychological framework, and recent findings in brain and life sciences. The theory views the mind and the environment as two significant spectrums, defining the mind as an information-collecting and processing entity. In contrast, the environment encompasses larger information-processing systems such as the Earth and social systems.

With this classification, we consider the activists engaging in blockade, vandalism, and harassment as "minds," while the settings where these events occur are viewed as the surrounding environment that the activists interact with. Consequently, the dataset is divided into two primary categories: Events and Activists. Additionally, the outcomes resulting from interactions between activists and their environment are classified into a third category: Consequences.

From September 8th to September 26th, 2023, two authors carried out the event identification and metadata retrieval processes. We also conducted crosschecks to maintain data quality and resolved any ambiguous information through discussion. In total, 89 cases in 13 countries were documented.

In this study, we employed eight variables in the dataset for the analysis. Seven variables demonstrating the activism actions conducted during the events were

retrieved from the Activists category of the dataset. These variables (*RallyDemonstration*, *March*, *EventDisruption*, *Sabotage*, *RoadBlockage*, *Assault*, and *ArtVandalism*) were also used as predictor variables in the statistical model. Another variable (*ViolenceEscalation*), retrieved from the Consequence category, was used as the outcome variable. The detailed descriptions of the variables are shown in Table 2.

Table 2: Description of variables.

Variables	**Description**	**Type of variable**	**Value**
ViolenceEscalation	Whether there was violence escalation between the protestors, police officers, and other citizens	Binary	Yes = 1 No = 0
RallyDemonstration	Whether the action is conducted in the form of a rally or demonstration	Binary	Yes = 1 No = 0
March	Whether the action is conducted in the form of a rally or demonstration	Binary	Yes = 1 No = 0
EventDisruption	Whether the action is conducted in the form of event disruption	Binary	Yes = 1
Sabotage	Whether the action is conducted in the form of sabotage	Binary	No = 0
RoadBlockage	Whether the action is conducted in the form of road blockage	Binary	Yes = 1
Assault	Whether the action is conducted in the form of assault or harassment	Binary	No = 0

ArtVandalism	Whether the action is conducted in the form of art vandalism	Binary	Yes = 1

2.1.2. Statistical model

The following model was constructed to examine the effects of activism action types on the escalation into violence:

$$ViolenceEscalation \sim normal\left(\log\left(\frac{\mu_i}{1-\mu_i}\right), \sigma\right) \quad (1.1)$$

$$\log\left(\frac{\mu_i}{1-\mu_i}\right) = \beta_0 + \beta_1 * RallyDemonstration_i + \beta_2 * March_i + \beta_3 * EventDisruption_i + \beta_4 * Sabotage_i + \beta_5 * RoadBlockage_i + \beta_6 * Assault_i + \beta_7 * ArtVandalism_i \quad (1.2)$$

$$\beta \sim normal(M, S) \quad (1.3)$$

The probability around the mean $\log\left(\frac{\mu_i}{1-\mu_i}\right)$ is determined by the form of the normal distribution, whose width is specified by the standard deviation σ. μ_i indicates the event i 's probability of being escalated into violence; $RallyDemonstration_i$ indicates whether event i was conducted in the form of a rally and demonstration; $March_i$ indicates whether event i was conducted in the form of a march; $EventDisruption_i$ indicates whether event i was conducted in the form of event disruption; $Sabotage_i$ indicates whether event i was conducted in the form of sabotage; $RoadBlockage_i$ indicates whether event i was conducted in the form of road blockage; $Assault_i$ indicates whether event i was conducted in the form of assault or harassment; $ArtVandalism_i$ indicates whether event i was conducted in the form of art vandalism. Model 1 has nine parameters: the coefficients, β_1 - β_7 , the intercept, β_0 , and the standard deviation of the "noise", σ. The coefficients of the predictor variables are distributed normally around the mean denoted M and with the standard deviation denoted S.

2.2. Analysis and validation

The Bayesian Mindsponge Framework (BMF), an innovative analytical method applied in cognitive and psychological research, was employed for the analysis in the current study. The method combines the inference benefits of Bayesian analysis and the strengths of Mindsponge Theory in reasoning, providing several advantages (Nguyen et al., 2022; Q.-H. Vuong et al., 2022). Firstly, the Bayesian

approach probabilistically considers all properties, including unknown parameters, facilitating accurate predictions through parsimonious models (Csilléry, Blum, Gaggiotti, & François, 2010; Gill, 2014). Secondly, compared to the frequentist approach, Bayesian inference offers various advantages, including the utilization of credible intervals and the consideration of parameter probabilities instead of dichotomous decision-making based solely on p-values (Wagenmakers et al., 2018). Thirdly, the good match between the Mindsponge Theory and the Bayesian inference enables researchers to utilize the information-processing principles of the Mindsponge Theory to elucidate the findings estimated using the Bayesian analysis (Nguyen et al., 2022).

Before checking the estimated results, the convergence diagnoses were employed to assess the Markov chains' convergence. When convergence is achieved, the Markov chain central limit theorem holds, rendering the estimated results reliable and suitable for interpretation. Statistical metrics such as the effective sample size (*n_eff*) and Gelman-Rubin shrink factor (*Rhat*) serve as indicators of Markov chain convergence. The *n_eff* value represents the number of independent samples generated during stochastic simulation. Typically, a value exceeding 1000 is considered adequate for inference and convergence (McElreath, 2018). The *Rhat* value, also known as the potential scale reduction factor, should ideally not surpass 1.1 for convergence. A value of 1 suggests convergence of the model (Gelman & Rubin, 1992). Furthermore, graphical tools like trace plots can also assist in verifying convergence.

The bayesvl R package and ggplot2 were employed to conduct Bayesian analysis and create visually appealing graphics (La & Vuong, 2019). To accommodate the exploratory aspect of this research, the model was computed using uninformative priors or a flat prior distribution, which offers minimal prior information for model estimations. The complete code and dataset utilized in this analysis have been deposited with the Open Science Framework to promote transparency, ensure future reproducibility, and reduce scientific costs (Q.-H. Vuong, 2018):

3. Results

Model fitting was conducted on R version 4.2.0 ("Vigorous Calisthenics"), employing four Markov chains, each comprising 5000 iterations, with 2000 iterations allocated for the warmup phase.

Table 3: Estimated results of Model 1

Parameters	**Mean**	**Standard deviation**	***n_eff***	***Rhat***
Constant	-8.10	4.61	3800	1
RallyDemonstration	-3.52	1.55	5832	1
March	-5.86	6.85	5784	1
EventDisruption	-9.69	5.69	4682	1
Sabotage	0.38	2.11	4568	1
RoadBlockage	8.16	4.46	3208	1
Assault	7.56	4.64	3230	1
ArtVandalism	-5.98	7.21	5152	1

All the estimated results of the constructed model are shown in Table 3. The effective sample size (*n_eff*) exceeds 1000, and the shrink factor (*Rhat*) equals 1 for all parameter instances. These metrics indicate that the Markov chains of the constructed model have achieved robust convergence. Visual inspection of the trace plots further confirms this convergence, with chains fluctuating around a central equilibrium point (see Figure 1). Given the convergence of the Markov chains, the estimated results are deemed reliable and suitable for interpretation.

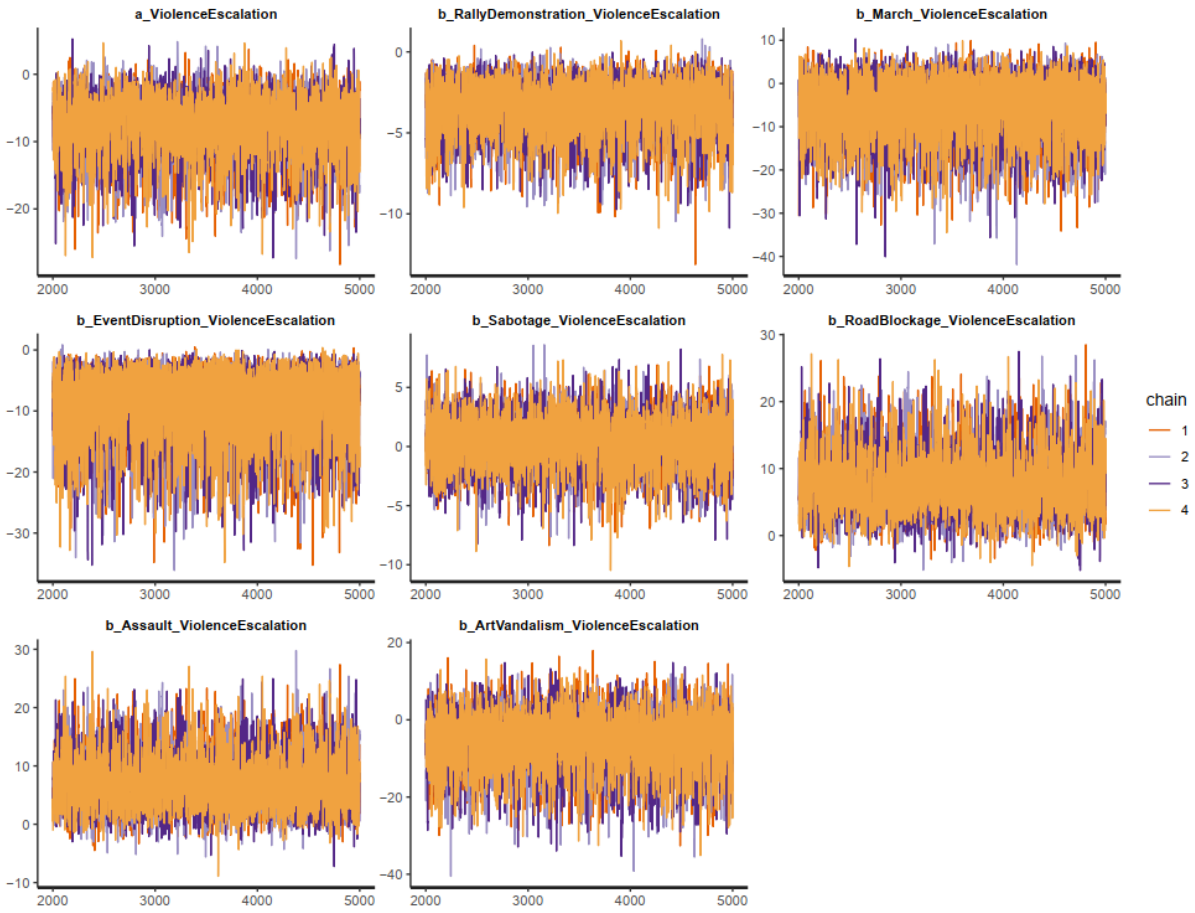

Figure 1: Model 1's trace plots

Road blockage ($M_{RoadBlockage}$= 8.16 and $S_{RoadBlockage}$= 4.46) and assault ($M_{Assault}$= 7.56 and $S_{Assault}$= 4.64) are positively associated with the probability of violence escalation, and sabotage has an ambiguous effect. Meanwhile, the estimated results show that rally and demonstration ($M_{RallyDemonstration}$ = -3.52 and $S_{RallyDemonstration}$= 1.55), march (M_{March}= -5.86 and S_{March}= 6.85), event disruption ($M_{EventDisruption}$= -9.69 and $S_{EventDisruption}$= 5.69), and art vandalism ($M_{ArtVandalism}$= -5.98 and $S_{ArtVandalism}$= 7.21) are negatively associated with the probability of violence escalation.

Figure 2 displays the coefficients' posterior distributions. The posterior distributions of *RoadBlockage* and *Assault* lie entirely on the positive sides of the origin (on the x-axis), indicating the high reliability of the positive associations. Although a portion of *March*'s and *ArtVandalism*'s posterior distributions are located on the positive side of the origin, that portion is minimal, suggesting moderate reliability of the negative associations of *March* and *ArtVandalism* with *ViolenceEscalation*.

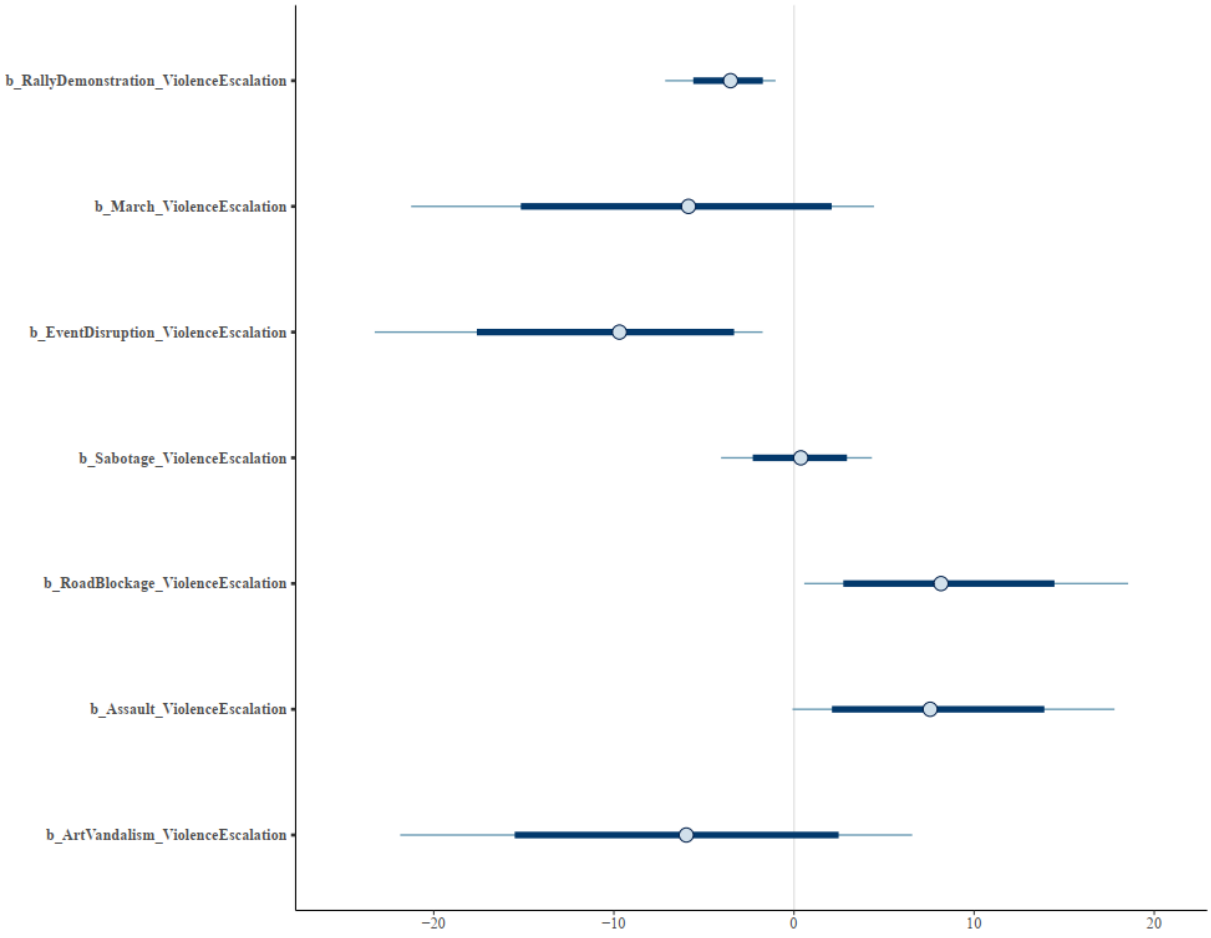

Figure 2: Model 1's posterior distributions

4. Discussion

The current study employed the Bayesian Mindsponge Framework analytics on a dataset of 89 blockage, vandalism, and harassment cases in 13 countries to explore types of activism that can lead to violence escalation consequences. We discovered that while rallies and demonstrations, marches, event disruption, and art vandalism were less likely to result in violence escalation between protestors, police officers, and other citizens, road blockades and assaults are more likely to lead to violence escalation.

Using the Mindsponge Theory, we can draw up some reasoning behind these results (Q.-H. Vuong, 2023). The Mindsponge Theory proposes that people's thoughts and actions stem from the mind's information processing system, aimed at maximizing benefits and minimizing costs to sustain the system, such as through survival, growth, and reproduction (Nguyen, Duong, Nguyen, La, &

Vuong, 2024; Q.-H. Vuong, 2022b, 2023). While violent action is a behavior that consumes much energy and involves many risks, especially in a society with norms, rules, and laws against it, a violent reaction might be considered a costly action as it can lead to detrimental effects on all the people involved. Then, the situation will spiral into violence when one or more parties involved or affected by activist events perceive that resorting to violence is both rationally and emotionally more beneficial than choosing non-violent alternatives.

Rallies, demonstrations, and marches represent common forms of activism widely accepted in high-income Western nations. Meanwhile, event disruption and art vandalism are forms of activism seemingly geared towards entertainment, with no apparent negative impact on others' survival needs. However, road blockages can adversely affect road users, including concerns like traffic safety and delays in commuting (e.g., for jobs) or emergencies (e.g., ambulances). On the other hand, assault or harassment directly endangers an individual's safety. In both scenarios, for their duties and safety, the police can sometimes take violent actions when the protests breach the law and injunction, resist the police's order or arrestment, or even attack the police (e.g., Extinction Rebellion's protest in The Hague on May 27th, 2023, Earth Uprising's assault on the police in France on June 20th, 2023) (Chrisafis, 2023; France-Presse, 2023). As these concerns are closely related to the survival needs of the affected citizens and police, violent reactions will subjectively be given more benefits of defending themselves (i.e., maintaining their livelihoods and protecting themselves from being harmed or means of survival), subsequently increasing the probability of violence escalation. This explanation is also aligned with the findings of Vestby (2019), suggesting that individuals in the African subpopulation experiencing worsening living conditions due to droughts were generally more inclined to engage in violence compared to those whose living conditions remained stable.

Environmental activism, especially for the sake of climate change mitigation, is expected to improve human well-being for society (Wolbring & Gill, 2023). Nevertheless, suppose the activism is not appropriately conducted. In that case, it can result in declining well-being as a consequence of violence escalation of the activists, affected citizens, and police (as documented in this study). That is not to mention the possible collateral impacts of violence escalation like declined public support, stress, climate anxiety, and a negative sense of doomerism (Hickman et al., 2021; Ropeik, 2019). These outcomes might continue

to push people towards extremist reactions or paralysis and disengagement (Clark, 2023; Ritchie, 2023).

Regarding art vandalism, despite its negative association with violence escalation, it should not be used as a method to raise public awareness and support for climate change mitigation. Artivism, or the use of artworks (e.g., paintings, music, films) in environmental activism, is becoming a vital constituent and weapon of activism for environmental crises, especially climate change, due to its power for expressing, communicating, and engaging with transformative politics (Rodríguez-Labajos, 2022; Q.-H. Vuong & Nguyen, 2023). Vandalizing invaluable artworks is almost equal to undermining the values of artworks, thus reducing the effectiveness of artivism. Moreover, art vandalism also risks giving the climate change denialists the weapons they can capitalize on to influence other citizens' cognitive processes and constrain climate change mitigation endeavors (Q.-H. Vuong, La, & Nguyen, 2023).

Therefore, we recommend that environmental activist groups adopt suitable and impactful approaches to raise public awareness, garner support, and avoid using tactics that can cause adverse effects and diminish public backing for environmental causes (e.g., art vandalism, road blockage, and assault). Activists should prioritize educating the public about climate change and other environmental issues, advocating for an eco-surplus culture, and fostering cooperation among governments, businesses, and citizens to develop solutions (Nguyen & Jones, 2022; Q.-H. Vuong, 2021; Q.-H. Vuong & Nguyen, 2024; Q. H. Vuong et al., 2021). This is crucial for the environmental movement's success in addressing climate change and confronting various environmental challenges. Moreover, it serves as a prerequisite for mitigating the risks and detrimental outcomes associated with extremism and radicalism on the global political stage, particularly when the planet requires human wisdom and solidarity more than ever.

The study is without limitations (Q.-H. Vuong, 2020). The process of identifying instances of blockage and vandalism through manual searching is limited in its scope, thus resulting in a dataset that only captures events that were prominent during the time of identification. Furthermore, the metadata primarily sourced from news outlets is susceptible to incompleteness. Additionally, the use of the English language for search queries introduces a geographical bias, with a predominance of events reported in Western countries. Therefore, the findings of this analysis should not be generalized, and more comprehensive studies should be conducted to validate and expand these findings in scale and scope.

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