Order in disorder?

The role of information communication technology on disorganised violence within civil resistance movements

Forogh Akbari

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Department of Peace and Conflict Research, Uppsala University
MSSc in Peace and Conflict
Supervisor: Dr Caroline Brandt
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Abstract

Nonviolent movements have been noted as one of the most successful forms of civil resistance. Thus, it is important for dissidents to maintain their nonviolent discipline to ensure their success. However, as communication technologies become cheaper and more accessible it is important to study how it can affect civil resistance movements. Existing research highlights that communication technologies such as the internet can provide faster information exchange in an unprecedented way for dissidents. More recent studies have considered the detrimental effects of incidental violence that are common within nonviolent movements. It shows that in the long run, this type of incidental, disorganised, unarmed violence can have dampening effects on future mobilisation. Yet, no previous research has sought to explain the direct role of digitisation on nonviolent campaign dynamics. Hence, this paper seeks to understand how increased internet access can impact dissidents' decisions to maintain their nonviolent discipline. I argue that greater internet access should reduce *disorganised* violence intensity within nonviolent campaign events. To investigate this relationship, I employ a quantitative research design at a city-protest week level to look at 917 nonviolent campaign events between 2005-2012. Overall, I find some limited support for the proposed hypotheses that indicates greater internet access can reduce disorganised violence.

Keywords: Nonviolence, civil resistance, information technology, protests

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1. Introduction

As societies become more digitised, it is important to consider how it can impact the risk of regime change within civil resistance movements. The advent of the internet has transformed the speed of communication in an unprecedented way. The internet also enables a faster exchange of information that can be more difficult for governments to control. Access to information technologies is also becoming cheaper and more affordable than before, This can open up more avenues for dissidents to increase momentum and mobilisation for their movement. One of the most successful forms of civil resistance is through maintaining a commitment to nonviolence. For example, recent protests in Algeria in the Hirak movement shows nonviolent dissidents using social networks to engage and maintain nonviolent action (L'Obs 2019). This shows that nonviolent dissidents use digital platforms to maintain their commitment to nonviolence. This paper investigates whether greater internet access can affect dissidents' commitment to nonviolence.

Nonviolent movements have often been attributed to democratic regime change within modernisation theory (Chenoweth and Ulfelder 2017; Gleditsch and Rivera 2017). Chenoweth and Ulfelder (2017) highlights that modernisation through technological changes can explain the onset of nonviolent movements. Although there are varying levels of violence present in nonviolent campaigns such as riots or individual fighting with police, its dynamics have been overlooked in the literature. Hence, this paper seeks to explore how technological changes can impact nonviolent campaign dynamics.

The literature on nonviolent movements has mainly focused on escalation towards *organised* violence or on the success of campaigns rather than its dynamics over time (Abbs and Gleditsch 2021). Therefore, looking at disorganised violence within nonviolent movements has been largely overlooked by scholars. Despite this, disorganised violence is common within many nonviolent protest campaigns (Abbs and Gleditsch 2021). The Nonviolent and Violent Campaign and Outcomes (NAVCO) dataset show that there is at least one recorded riot event, despite this disorganised violence remains poorly understood (Chenoweth, Pinckney, and Lewis 2018). Therefore, this paper seeks to fill this gap by looking at nonviolent dissidents' decisions to use disorganised violence.

Within the literature, there is a debate about the logic of disorganised violence by dissidents used in nonviolent social movements. Research has shown that the use of protester violence decreases the chances of campaign success. Therefore, within the logic of nonviolent dissidents, they would want to minimise any level of violence to maintain their legitimacy and commitment to their cause. Recent research has shown how rioting within nonviolent campaigns can increase the likelihood of campaign collapse in the long run (Abbs and Gleditsch 2021). On the other hand, Collins (2009) argues that this disorganised unarmed violence is random and driven by emotions. Therefore, this paper seeks to fill this gap in the literature by considering whether the role of the communication technologies can affect dissident's decision to use disorganised,

unarmed violence. Hence, this paper asks: *how does internet access affect disorganised, unarmed violence intensity within nonviolent civil resistance campaigns?*

This paper argues in line with the rationalist perspective that nonviolent dissidents take into account audience costs that make them less likely to engage in violence. As studies have shown, violence can decrease the potential pool of protesters to join (Sharp 1973; Chenoweth and Ulfelder 2017). However, I argue that the role of technological changes has not been considered in mediating this effect on disorganised violence. This paper argues that greater access to the internet increases audience costs for nonviolent dissidents which can lead to a reduction in disorganised violence.

Within social movements, the state can also respond with repression to demobilise dissidents. Research has also highlighted the role of state repression that can impact disorganised violence. Some scholars argue when repression occurs, future mobilisation is less likely to occur (Rød and Weidmann 2019). However, within the scope of the nonviolent theory, scholars highlight that dissidents can use *political jiujitsu* to expose and communicate regime violence to potential participants (Sharp 1973; Butcher and Svensson 2016). This can lower the perceived costs of participation for potential protesters. Hence, I also argue that when there is greater internet access, nonviolent dissidents are more likely to use political jiujitsu through digital means to expose state repression. Therefore, one should also a reduction in disorganised violence when there is greater internet access.

To test both parts of my hypothesis, I used city-protest week data from NAVCO 3.0 event dataset to investigate the relationship (Chenoweth, Pinckney, and Lewis 2018). I also use replication data provided by Rød and Weidmann (2019) to utilise sub-national measures of internet penetration that have been developed by computer scientists that capture the amount of internet traffic from a particular place. I create a subset of NAVCO 3.0 data which captured all nonviolent campaign events in a protest week that predominately used nonviolent tactics (N=917). Based on previous theory, I assume that tactics that are coded as nonviolent tactics are inherently disorganised types of violence.

Using this dataset at the city-protest week level, I run a zero-inflated negative binomial regression looking at the outcome of fatalities/causalities in nonviolent campaigns. I find support for the first part of my hypothesised relationship, showing a significant reduction in disorganised violence. However, I do not find support for the second part of my hypothesis, instead, I find that greater internet access increases disorganised violence when repression occurs. This provides some support for the first part of my hypothesis that tentatively supports the rationalist perspective of nonviolent dissident logic. I further explore other explanations that could also explain the other direction of my hypothesised relationship. In addition, I also run a robustness test that shows my findings were driven by extreme values. These findings show that my proposed hypotheses are not supported.

This paper proceeds as follows, in the next chapter I summarise previous research and identify the research gap that motivates my research question. Then I provide a theoretical framework which highlights the causal mechanism and proposed hypotheses. In chapter 4, I lay out the research design that describes the data used and motivates the use of a zero-inflated negative binomial model as my main model. Then I present my findings, presenting the descriptive statistics

and the main results of the model. Then I interpret my findings in relation to theoretical implications and present robustness checks of my main model. In chapter 6 I discuss the implications of my findings and reflect on their limitations. Finally, I provide concluding remarks on the overall findings of this thesis along with recommendations.

2. Literature review

This chapter discusses the major strands of the emerging literature that have sought to explain how disorganised violence impacts nonviolent movements. It highlights how there is a debate in the literature about the use of disorganised violence by dissidents. Some argue disorganised violence can undermine nonviolent mobilisation while others argue it can also have potential mobilising effects (Abbs and Gleditsch 2021). This thesis seeks to question whether there is a logic in the use of disorganised violence by nonviolent dissidents.

I first discuss the broader literature on the use of violence is used in protest movements. It argues that violence is a strategy when nonviolence is no longer seen as effective. Then, I zoom in on how disorganised violence is used in nonviolent campaigns which highlight how it can demobilise and reduce its chances of success. Then, I look at how state repression can affect disorganised violence. Within the rationalist perspective, nonviolent dissidents would want to maintain their nonviolent strategy to ensure success. However, other scholars highlight the role of emotion that can embolden dissidents. I highlight that the role of information technologies such as internet access has been overlooked in its potential mitigating effects on disorganised violence. Finally, I aim to contribute to the wider research on whether information technologies can impact dissidents' decision to use disorganised violence.

2.1 Conditions and risks of using violence

The majority of the research has largely focused on escalations to organised violent events but the *level of unarmed, unorganised violence* remains under-researched (Chenoweth and M. J. Stephan 2011; Chenoweth and Schock 2015; Della Porta et al. 2018). Scholars argue that dissidents use violence as a strategy and only resort to using violence when nonviolence is seen as ineffective in gaining political concessions (Nepstad 2015b; Della Porta et al. 2018). Thus, the use of violence depends on the dissident's chance of success (Della Porta et al. 2018).

Scholars highlight there are structural factors that need to be taken into account, that can make violence more likely to occur in nonviolent movements (Della Porta et al. 2018; Schock 2005). Schock (2005) that a united opposition is important in challenging the state as you can leverage broad-based appeals to create loyalty shifts from regime supporters (29). For example, greater class or ethnic divisions of the opposition can make it more difficult to generate broad-based appeals (Schock 2005; Della Porta et al. 2018). Creating loyalty shifts within the military is seen as important for nonviolent campaign success (Nepstad 2015b). Nepstad (2015b) highlights that if the *military* is composed of different ethnic groups uses broad-based appeals to create loyalty shifts. Thus it can be difficult for nonviolent dissidents to continue their nonviolent discipline through broad-based appeals if there are ethnic divisions. Therefore, scholars highlight that there are structural factors such as ethnic power dynamics that can influence dissidents' decision to maintain to nonviolent discipline.

Scholars also highlight that it also differs by regime type that can influence the structure of political opportunities (Della Porta et al. 2018). Thus it has been highlighted how regimes under transition can create instability that can be taken advantage of by dissidents that can increase the risk of violence (Della Porta et al. 2018; Tilly 1995). Other factors, such as organisational capacity and availability of resources can also influence the use of violence (Della Porta et al. 2018: 10). Therefore, these scholars highlight there are these structural conditions which can increase the risk of violence by nonviolent dissidents. Under these conditions, it can be difficult to gain political concessions through nonviolence and thus can increase risk of using violence.

The use of violence is also costly to nonviolent dissidents. Scholars highlight the use of any type of violence can impact dissidents' success in three main ways: first, it can delegitimise their cause, increase the costs of participation of inactive citizens and alienate moderate allies (Nepstad 2015a; Chenoweth and Schock 2015; Sharp 1973). Nonviolent dissidents need the support of citizens to generate mass mobilisation. Therefore dissidents also need to take into account how violence effects the bystander's choice in participation (Abbs and Gleditsch 2021; Steinert-Threlkeld, Chan, and Joo 2022). When protester violence occurs the costs of participation increase for bystanders which reduces future mobilisation (Steinert-Threlkeld, Chan, and Joo 2022). Research has also shown how the existence of violent flanks can discredit the goals of the campaign (Chenoweth and Ulfelder 2017; Abbs and Gleditsch 2021). As the aim of nonviolent logic is to create broad-based appeals, the use of violence can alienate moderates which can lead to more divisions which can lead to campaign failure. Nonviolent movements guarantee the safety of regime actors if they choose to defect (Chenoweth and Stephan 2013). Using violence, therefore makes it more difficult to elicit defection by government supporters which is key to the success of nonviolent campaigns (Chenoweth and Schock 2015; Sharp 1973: 397–414). This shows, that using violence in nonviolent can potentially lead to campaign failure as it can demobilise their movements and alienate potential participants.

This section highlighted how there are structural factors such as the structure of the opposition, ethnic power dynamics and regime types that can increase the risk of violence (Della Porta et al. 2018; Schock 2005). It has also highlighted how use of violence in nonviolent movements can be costly and reduces the chance of campaign success. As mentioned, violence can delegitimise their cause, increase costs of participation and alienate moderates (Chenoweth and Stephan 2013; Sharp 1973). These factors can undermine the goals and legitimacy of the nonviolent campaign which lead to the failure of the movement. Thus, within the rationalist perspective, one can assume that nonviolent dissidents would want to avoid violence to ensure the success of their campaigns. In the next section, I look at the emerging literature on disorganised violence that occurs within nonviolent movements. This type of violence is the most common that occurs within nonviolent movements however it has been largely overlooked in the nonviolent literature (Abbs and Gleditsch 2021).

2.2 The logic of disorganised violence

Moving on from the broader literature on violence used in nonviolent movements, this section will explain how disorganised violence is used within nonviolent movements. As this is a relatively

new and emerging literature, its theoretical underpinnings are borrowed from sociology as well as peace and conflict studies (Abbs and Gleditsch 2021; Collins 2009). Disorganised violence is distinct from other forms of violence as it tends to be lower levels of violence that do not require planning or coordination. It has been highlighted that disorganised violence is most common within nonviolent campaigns but has been largely overlooked (Abbs and Gleditsch 2021).

Disorganised violence is inherently a type of violence that is uncoordinated and unplanned. It is common that participants start to fight with police, throwing rocks or possibly incendiary devices (Abbs and Gleditsch 2021). In the case of Mozambique, it was shown that the much of violence within the nonviolent movement was spontaneous that were driven by emotions and outburst of anger (Seferiades and Johnston 2016: 12–13). Sociologist Collins (2009) argues that this type of violence is opportunistic and often is used against random and immediate targets. He also argues that disorganised violence faces lower barriers and anonymity than resorting to organised violence as it does not require as much coordination, planning or future commitments (Collins 2009: 39–73). He also emphasises how it is based on emotional responses such as fear that can lead to disorganised violence. This explains why this type of violence is common within nonviolent campaigns due to its lower barrier of entry. Although disorganised violence is inherently unplanned, one can question the extent to which it is assumed to be spontaneous or random.

Based on the rationalist perspective, scholars argue that disorganised violence is something to avoid rather than a tactic used by dissidents (Bhavnani and Jha 2014; Popovic and Miller 2015; Abbs and Gleditsch 2021). In line with the literature mentioned in section 2.1, any type of violence can dampen future mobilisation as well as lead to campaign failure. Case studies have also shown that disorganised violence can pose a challenge for movements seeking to maintain nonviolent discipline (Bhavnani and Jha 2014). Based on previous civil resistance mentioned, has shown that the presence of violent flanks can discredit a campaign and make it difficult to elicit defection by government supporters which are key for success (Chenoweth and Schock 2015; Nepstad 2011; Sharp 1973). Therefore, disorganised violence can also undermine initial participation as well as future mobilisation. Thus, within in the rationalist perspective, disorganised violence can also dampen future mobilisation and poses a challenge for nonviolent movements. Therefore, one can argue dissidents want to avoid disorganised violence to ensure campaign success. This contends with the assumption that disorganised violence is inherently spontaneous and random.

However other scholars argue that disorganised violence can also mobilise the social movement. Some scholars argue disorganised violence can help draw attention to outwardly showing their collective dissatisfaction (Ketchley 2017: 18–45). By disseminating wider public dissatisfaction is key to heighten a sense of emergency for the state (Ketchley 2017; Abbs and Gleditsch 2021). This can increase mobilisation as bystanders will see widespread dissatisfaction exists and also believe that others will participate (Abbs and Gleditsch 2021: 15). In addition, scholars have also highlighted that emotions also play a role. When riots occur, there can also be emotional responses and perceived frustrations that could signal perceived injustice by seeing the risks other people are willing to take (Seferiades and Johnston 2016; Abbs and Gleditsch 2021). This also contends with the assumption that disorganised violence is random as it can be used by dissidents to signal their discontent. A recent study by Abbs and Gleditsch (2021) shows that disorganised

violence can have short term mobilising effects on protest but in the long run it campaigns are likely to collapse. This provides insights into the temporal dynamics of disorganised violence. It highlights that in the long run, nonviolent dissidents should avoid violence as it can lead to campaign failure.

This section explained the role of disorganised violence within nonviolent movements. Disorganised violence is a common type of violence within nonviolent movements that is inherently unplanned (Abbs and Gleditsch 2021). Based on classical civil resistance literature, it highlights that disorganised violence can have detrimental effects on civil resistance success through discrediting their cause and alienating moderates (Bhavnani and Jha 2014; Chenoweth and Schock 2015; Sharp 1973). However, it has also been argued that disorganised violence can also mobilise social movements by showing widespread dissatisfaction with the regime (Ketchley 2017; Abbs and Gleditsch 2021). A more recent study has shown that this is true in the short term but in the long term horizon, disorganised violence can lead to campaign collapse (Abbs and Gleditsch 2021). This contends with the assumption that disorganised violence is spontaneous and thus shows it can have great costs to nonviolent dissident campaigns. I argue that within the rationalist perspective that nonviolent dissidents take this cost into account. In the next section, I will highlight literature that explores how repression can affect nonviolent protest dynamics and its consequences on disorganised violence.

2.3 The role of repression

This section will outline how state repression can impact nonviolent movements. First, I discuss relevant literature that describes how repression affects broader protest dynamics. I highlight how the severity of repression is also important and effect disorganised violence. Then, I look at the role of *political jiu-jitsu* and explain nonviolent logic to maintain their nonviolence in the face of repression that aid campaign success.

Repression is used by the government to send a signal about the costs of participation to the inactive civilian population, current protesters and their support base (e.g. their target audience) (Sutton, Butcher, and Svensson 2014). Some scholars highlight that repression can decrease future mobilisation in protests (Della Porta et al. 2018; Rød and Weidmann 2019). From the literature on the onset of civil war, it has been highlighted that *indiscriminate* repression can increase violence (Della Porta et al. 2018). This type of repression can be seen as deeply unjust that can cause anger and legitimise the use of violence by dissident groups (Della Porta et al. 2018: 10).[1] However within the scope of the nonviolent theory, it highlights, that when repression occurs maintaining nonviolent discipline is crucial (Pinckney 2016). This is important to generate *backfire* which is to reduce state authority when repression occurs. Therefore, nonviolent dissidents would want to maintain their nonviolent discipline when repression occurs. It has been highlighted for state repression to generate backfire nonviolent dissidents must avoid a violent response (Pinckney 2016; Sutton, Butcher, and Svensson 2014). This highlights when repression occurs, nonviolent dissidents would not use a violent response.

1. Note: The literature here highlights it is relevant within the scope of transition towards organised armed conflict which is not the scope of this paper.

However, recent studies have considered the severity of repression and also the role of emotions that can play on protest dynamics based on social psychology (Steinert-Threlkeld, Chan, and Joo 2022). They argue that the severity of repression also matters for triggering different types of emotion that can increase or decrease protest violence(Jasper 2011; Steinert-Threlkeld, Chan, and Joo 2022). They highlight lower levels of repression trigger emboldening emotions such as anger, protesters are likely to persist and bystanders are likely to mobilise. Therefore, dissidents are more likely to maintain committed to nonviolence to maintain their legitimacy. However, higher levels of repression can trigger discouraging emotions such as sadness that can cause a reduction in future mobilisation (Jasper 2011; Steinert-Threlkeld, Chan, and Joo 2022). This can make it more likely for dissidents to use violence if they feel that the chances of success are low and become less committed to the principle of nonviolence (Nepstad 2011). This shows that the severity of repression should also be taken into account when considering the impact on dissident violence.

Scholars of nonviolence also highlight that in the face of repression, dissidents use the strategy of political jiu-jitsu to increase the mobilisation and legitimacy of their cause (Sutton, Butcher, and Svensson 2014; Butcher and Svensson 2016). Political jujitsu is a strategy used by dissidents to expose the use of violence by opponents towards their cause (Sharp 1973: 657). When repression occurs, dissidents would need to communicate government repression to potential participants and need to lower the perceived costs of participation (Butcher and Svensson 2016; Sutton, Butcher, and Svensson 2014). Scholars have shown how campaign infrastructure can increase mobilisation and security defections after state repression (Sutton, Butcher, and Svensson 2014). They highlight that *parallel media* institutions (both traditional and internet based media) can increase the likelihood of domestic mobilisation of nonviolent movements (Sutton, Butcher, and Svensson 2014). This can make dissidents more committed to the principle of nonviolence as it can lead to the success of the campaign and can increase dissidents' costs of using violence. However, they do not account for the difference between print and internet based media effects increasing mobilisation and its relation to dissident's use of violence (Sutton, Butcher, and Svensson 2014). I highlight there could be potential mitigating effects of the internet based media, relating to information technologies on disorganised violence.

2.4 Information technology and the research gap

This section will discuss how the internet could have potential mitigating effects on disorganised violence. This paper will argue in line with the rationalist perspective of nonviolent logic, that disorganised violence can have detrimental effects on campaign success thus minimising their violence intensity. First I will briefly outline some literature on how internet access has impacted protest dynamics. Then I will motivate the research gap.

Studies have looked at how the internet affect protest dynamics (Rød and Weidmann 2019; Howard and Hussain 2011; Steinert-Threlkeld et al. 2015). They have mainly focused on how the internet can affect mobilisation with regard to overcoming collective action problems. Rød and Weidmann (2019) when a protest occurs, greater internet access can catalyse protest movements. This is because if dissidents can sustain protest at a particular location or extend it to others they are more likely to gain political concessions. This is in line with Kuran (1989) theory that citizens

who are critical of the state do not reveal their preferences due to fear of repression. However, once protests occur, it reveals that the discontent is more widespread than previously assumed, therefore citizens abandon 'preference falsification' that can increase mobilisation. Rød and Weidmann (2019) also found that greater internet access can reduce future protests when state repression occurs as greater communication can increase the perceived costs of bystanders to participate in protests. However, its role in nonviolent campaigns has not been explored. Therefore this paper seeks to ask:

> *How does internet access affect disorganised, unarmed violence intensity within nonviolent civil resistance campaigns?*

I argue that the role of the internet has been overlooked in explaining dissidents' decisions to use violence within social movements. The internet may have a more pronounced effect due to the speed of connectivity and access to international audiences (Rød and Weidmann 2019). As disseminating information is key for dissidents, I aim to fill the research gap by considering its effect on nonviolent dissident movements. Dissidents often use social networks to display their goals and strategies to a wider audience to build momentum for their campaigns. As mentioned, scholars of nonviolence such as Sutton, Butcher, and Svensson (2014) have found that internet-based media can increase mobilisation through the use of political jiu-jitsu when state repression occurs. This can aid in their legitimising their goals to both domestic and international audience costs for dissident groups that can reduce violence in social movements.

3. Theoretical Framework

This chapter builds on the literature review and develops a theoretical framework that explains how communication technologies can affect nonviolent dissidents' decision to use disorganised violence. First, I define the main concepts used in the framework and delimit the scope of the paper. Then, I explain how communication technologies can affect disorganised violence in nonviolent campaigns within the rationalist perspective. I build on Butcher and Svensson (2016) and the political jiujitsu theory on the role of media infrastructure when repression occurs. Following that, I present the causal mechanism that explains why there would be a reduction in disorganised violence. Finally, I present my hypothesis in two parts in relation to the causal mechanism along with specified scope conditions.

3.1 Key concepts

Here, I outline the differences and dynamics between violent and nonviolent movements. This paper focuses on the role of *disorganised, unarmed* violence that exists in nonviolent social movements. The social movement literature largely classifies campaigns as either violent or nonviolent (Chenoweth and M. J. Stephan 2011; Chenoweth and Ulfelder 2017; Butcher and Svensson 2016). (Cunningham, Lewis). However, this paper moves away from the isolationist approach and seeks to look at the dynamics of nonviolent protests. Some scholars argue that there are structural conditions that determine nonviolent and violent movements and therefore should be studied separately (Abbs and Gleditsch 2021; Chenoweth and Ulfelder 2017). Scholars have also looked at the shift from nonviolent movements towards organised armed violence (Della Porta et al. 2018; Gleditsch and Rivera 2017). However, the role of disorganised unarmed violence has been overlooked within nonviolent campaigns (Abbs and Gleditsch 2021). To describe the theoretical framework and causal argument, one must first clarify how disorganised violence is situated within the civil resistance literature.

3.1.1 Nonviolent and violent protests

Protests movements seek to gain political concessions from the regime by imposing costs through civil disobedience (Nepstad 2011; Sharp 1973). Violent tactics primarily aim to impose costs through using physical force whereas nonviolent seek to achieve their goals without using force (Schock 2005). Therefore, this paper only looks at campaign events which use nonviolent tactics. Nonviolence assumes that the regime's legitimacy depends on the cooperation of the *mass* citizens (Sharp 1973). Organised nonviolent resistance and nonviolent tactics are therefore distinct from organised violence such as guerrilla warfare or terrorist campaigns. It has been highlighted that there are different structural conditions that contribute to the onset of violent and nonviolent resistance (Gleditsch and Rivera 2017; Chenoweth and Ulfelder 2017). Violent dissident

groups are more likely to use segregated based appeals to mobilise (Gleditsch and Rivera 2017). Whereas nonviolent movements seek to use broad-based appeals to mobilise large numbers to legitimise their cause and target those who are supporters of the regime (Sharp 1973; Chenoweth and Ulfelder 2017). The aim of nonviolent civil resistance is dependent on mass mobilisation, loyalty shifts, and direct challenges to government legitimacy (Nepstad 2011). Sharp (1973) highlights there are three broad categories of nonviolent resistance: persuasion, non-cooperation and intervention (49-60). Therefore, this analysis is delimited to only nonviolent resistance campaigns and uses the term nonviolent action as:

> A generic term covering dozens of specific methods of protest, noncooperation and intervention in all which activists conduct the conflict by doing or refusing to do- certain things without using physical violence (Sharp 1973: 64).

Nonetheless as mentioned, within many nonviolent campaigns there are varying violence intensity (Abbs and Gleditsch 2021). This type of violence tends to have lower levels of planning and coordination. This paper assumes that this type of incidental violence within nonviolent campaigns is inherently *disorganised*. Within nonviolent mass mobilisation, it can create potentially volatile scenarios without prior intent (Abbs and Gleditsch 2021). One should note that incidental violence such as riots can also occur outside of civil resistance campaigns as well (Abbs and Gleditsch 2021). However, this paper only looks at disorganised violence that occurs within nonviolent civil resistance campaigns.

Collins (2009) highlights how this type of violence tends to be opportunistic and lashes out at random targets. Unorganised violence also has much lower entry barriers than organised violence as it does not require coordination or future commitments (Collins 2009; Abbs and Gleditsch 2021). It has also been highlighted that dissidents respond with disorganised violence due to fear as an emotional state. As highlighted in the literature, violence can reduce future nonviolent mobilisation and therefore, it is seen as something to avoid rather than a tactical choice (Popovic and Miller 2015). Studies have shown that the risk of disorganised violence poses a challenge for movements seeking to maintain nonviolent discipline and maintain broad public support (Bhavnani and Jha 2014: 77–79). However, I also argue that nonviolent dissidents aim to also create broad public support on social networks to create more momentum for their campaign. This can increase audience costs in the online platform which can change the dissident's decision to use disorganised violence.

3.2 Pacifying effects of the internet

In this section, I explain how greater access to the internet can reduce disorganised violence in nonviolent campaigns. This is in line with scholars who argue that nonviolent movements avoid violence due to its detrimental effects on achieving large-scale popular participation (Abbs and Gleditsch 2021; Popovic and Miller 2015). This perspective highlights how disorganised violence is harmful to the nonviolent discipline and legitimacy of the movement.

I argue that greater internet access would affect nonviolent dissidents' decision to avoid disorganised violence. Nonviolent movements aim to obtain political concessions from the regime by

creating elite defection and maintaining broad-based appeals (Sharp 1973; Nepstad 2011). Research has shown that greater internet connectivity increases international communication linkages which can facilitate social learning across borders (Levitsky and Way 2006). I argue that greater internet connectivity exposes nonviolent dissidents through both international and domestic audience costs. Greater internet connectivity, allows nonviolent dissidents to legitimise their cause to an international audience. This includes creating an online presence and connecting with international organisations and other potential political ties. This is important to nonviolent dissidents as it increases international pressure on the regime. However, this can also expose nonviolent dissidents to greater international audience costs. I argue that nonviolent dissidents take these international audience costs into account and therefore are more likely to maintain their commitment to nonviolence.

In addition, greater internet access can also affect inactive citizens' decision to join protests. As nonviolent dissidents want to increase mass mobilisation, they need to create broad-based appeals to their domestic audience. As mentioned, disorganised violence can increase participation costs that can reduce their mobilisation and campaign success. As previously highlighted, research has shown how the presence of violent flanks can discredit a campaign and make it more difficult to elicit defection which is key to political success (Chenoweth and Ulfelder 2017). Scholars have highlighted how people often respond with fear and flee in potentially dangerous situations. Therefore, due to greater connectivity, I also argue nonviolent dissidents are aware of increased domestic audience costs (Collins 2009). Hence, I argue that greater internet access can reduce disorganised violence due to increase audience costs.

> H1a: Increase internet access decreases disorganised, unarmed violence within nonviolent campaigns

I also argue when there is greater internet access in the face of repression, nonviolent dissidents use political jiujitsu to maintain their commitment to nonviolence. Political jiujitsu is a strategy used by nonviolent dissidents to expose the use of violence by opponents towards their cause. As previously mentioned nonviolent dissidents use political jiujitsu through *parallel media* that can increase mass mobilisation when repression occurs.

> Parallel media is institutions that enable the opposition to communicate with potential supporters independent of the the regime and coordinate the actions of dissidents in the wake of repression (Sutton, Butcher, and Svensson 2014: 564)

They highlight that parallel media can involve print media, television, radio and internet-based media (Sutton, Butcher, and Svensson 2014: 564). However, I argue that the internet has a more pronounced effect due to the speed of connectivity that can expose state repression. As civil resistance literature highlights that nonviolent dissidence is important to generate backfire which is the reduction of state authority that uses violent repression. To generate this backfire, nonviolent dissidents must avoid violent backlash to state repression (Pinckney 2016). I argue when there is greater internet access, nonviolent dissidents use political jiujitsu to generate backfire. Therefore, within nonviolent logic dissidents are less likely to use disorganised violence. Therefore the second part of my hypothesis is:

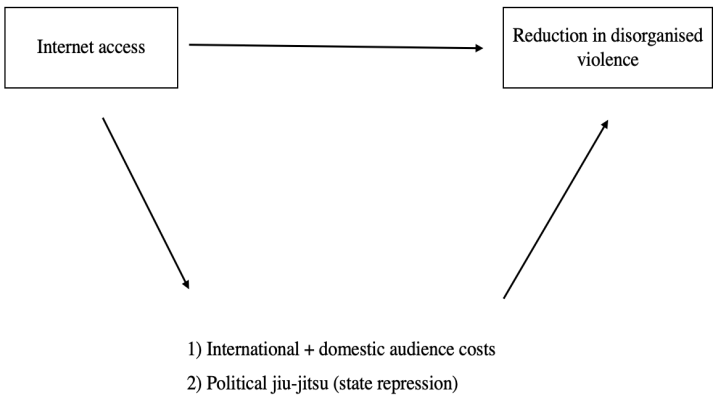

Figure 3.1. Causal mechanism

H1b: Increase internet access decreases disorganised, unarmed violence when state repression occurs within nonviolent campaigns

The figure 3.1 above summarises the proposed causal mechanism. Overall, I argue greater internet access in should reduced the disorganised violence intensity.[1] This occurs through two causal mechanisms. The first is that it increases international and domestic audience costs that can make nonviolent dissidents more likely to maintain their discipline. The second mechanism is conditional when state repression occurs. I build on Sutton, Butcher, and Svensson (2014) theory arguing when state repression occurs, nonviolent movements are likely to use political jiu-jitsu through internet based media. Thus, there should also be a reduction in disorganised violence when repression occurs. In conclusion, I argue greater internet access has a dampening effect on disorganised violence.

3.3 Scope conditions

Here, I briefly outline some relevant scope conditions. In order to study disorganised violence within nonviolent campaigns, one must look at areas where protests are likely to occur. As this theory only applies to nonviolent dissident campaigns, one must only look at nonviolent movements. In addition, based on theory, I assume the disorganised violence within nonviolent movement is inherently *disorganised*. Previous literature highlights protest are more likely to occur in cities or urban areas (Rød and Weidmann 2019). Therefore, the scope of this analysis is limited to cities, thus I only look at city-protest week. In addition, as I am interested in anti-regime campaigns and where repression is likely, my universe of cases is thus restricted to autocracies and anocracies.

1. I use the term disorganised violence intensity, as there is always a varying level of disorganised violence that exists within nonviolent movements (Abbs and Gleditsch 2021).

4. Research Design

This chapter specifies the operationalisation of the data used in this paper and discusses its respective limitations. First I specify the scope conditions and universe cases appropriate to test the proposed theory. Then I explain the unit of analysis and data structure. Then I explain the limitations and data availability issues concerning validity and reliability. I discuss the operationalisation of the dependent variable and independent variable of interest along with the limitations associated with them. Then I discuss control variables used in the model and potential challenges related to omitted variable bias.

4.1 Scope conditions and universe of cases

This section outlines the scope conditions and universe of cases to which the theory applies. As the aim of this study is to look at anti-regime protests, it is limited to autocratic or semi-democratic countries. As mentioned, to capture disorganised violence within protest movements, one must look at areas where protests are likely to occur. Literature highlights protests are more likely to occur in cities or urban areas (Rød and Weidmann 2019). Therefore, the scope of this analysis is limited to cities, thus I only look at city-protest week. Thus, the universe of cases that is appropriate to test the proposed theory are in autocracies or anocracies at the city-protest week level.

4.2 Unit of analysis and data structure

The unit of interest is the number of violent events within nonviolent protest campaigns at the city protest-week level. I assume that the violence that is coded as nonviolent campaigns is an inherently *disorganised* type of violence based on theory Abbs and Gleditsch (2021). As this paper is interested in the micro dynamics of nonviolent campaigns, large-scale aggregate datasets are not an appropriate unit of analysis to investigate the level of violence within nonviolent campaigns (Chenoweth, Pinckney, and Lewis 2018). Aggregate datasets tend to bias the sample towards contentious actions into campaigns that do not capture the changes between nonviolent and violent and thus tend to misclassify campaigns (Chenoweth, Pinckney, and Lewis 2018). Studies focusing on the micro-dynamics tend to be limited to country-level analysis that does not provide micro-dynamics of civil resistance within and across authoritarian regimes (Huet-Vaughn 2013). The NAVCO dataset categorises each method according to whether it is an act of commission or omission, this allows scholars to distinguish between the different types of tacticsChenoweth, Pinckney, and Lewis 2018. Hence, this paper utilises the Chenoweth, Pinckney, and Lewis 2018 dataset chosen to look at sub-national data at the city-week level as the appropriate unit of analysis.

By using the NAVCO 3.0 dataset which contains event-based data on violent and nonviolent campaigns at a daily level (Chenoweth, Pinckney, and Lewis 2018).[1] I create a suitable dataset by merging Rød and Weidmann (2019) and Chenoweth, Pinckney, and Lewis (2018) at the city week level. First I create a subset of the NAVCO 3.0 dataset by only looking at campaign events that primarily used nonviolent tactics that are coded as 1. Then, I aggregate the NAVCO 3.0 dataset to the weekly level and then by cleaning the 'localities' variable to the city by converting it to coordinates of a city [2]. Then I merge it by protest week to get the suitable dataset needed.

4.3 Limitations and data availability

Due to limited data available when the dataset is merged by city level, it only includes a sample of nine countries, this creates a biased sample. One source of bias is due to the inherent bias in NAVCO 3.0 (Chenoweth, Pinckney, and Lewis 2018) dataset as it is already oversampled from the Middle East and Africa due to interest and also a tendency for such regions to be inherently violent. In addition, as the aim of this paper is to look at events that capture popular uprisings hence it is focused on certain countries within the period (Chenoweth, Pinckney, and Lewis 2018) (Table 7 and 1). Therefore, the sample of the data is limited to nine countries available which samples 49 cities within the countries (see table 7) weekly between 2005-2012 (N=917).

The NAVCO 3.0 dataset event data is based on news reporting that does affect the validity of the study. The data is based on human coding by trained research assistants that also had a low error rate and ensures high inter-rater reliability in the replication of random samples (Chenoweth, Pinckney, and Lewis 2018: 528). Human coders also are necessary to observe symbolic events that are more difficult to capture through automated coding such as the Integrated Crisis Early Warning System (ICEWS) (O'Brien 2010).

There are other data sets such as the European Protest and Coercion data that contain daily-city level information however it is limited to European states between 1980-1995 period (limited to democratic states). Other databases such as the Armed Conflict Location and Event Data project and the Social Conflict in Africa Database focus on large-scale protests and riots (Raleigh et al. 2010; Salehyan et al. 2012). However, these data sets capture broader and large-scale events but do not differentiate between violent and nonviolent campaigns. More recent datasets have been released such as the Mass Mobilisation in Autocracies Dataset (Rød and Weidmann 2019). However, their scope is limited in differentiating the different types of tactics a campaign uses and tends to focus on the more violent protests. Therefore these types of datasets may not be an optimal choice to study the level of violence within nonviolent civil resistance movements.

Another concern is the reporting bias as media reports tend to report certain events but omit other events due to both the demand and supply of types of reporting (Weidmann 2016). This introduces the issue of under-reporting lower counts of violent events as these smaller causalities are less likely to be reported as they are less newsworthy compared to large-scale violent events. In addition, reporting bias tends also to report mainly urban events, Davenport and Ball (2002) also identify that newspaper tends to underreport rural violence. However, as my sample

1. The NAVCO 3.0 datasets has a limited case selection of 21 countries that are picked due to resource constraints.
2. I do this by using a python package: https://pypi.org/project/geopy/ and see appendix A for the function used

includes major cities in each country, thus does not compare between urban and rural, this is not a considerable issue.

4.4 Operationalisation of main variables

This section provides an overview of the operationalisation of the variables. First, it explains how it operationalises the dependent variable, *disorganised violence* and the independent variable of interest *internet penetration*. Then I motivate the use of my control variables.

4.4.1 Disorganised violence

As mentioned before, I use the NAVCO 3.0 dataset to look at nonviolent campaigns. From this, I created a subset of all campaign events coded as nonviolent. I use the variable 'fatal/causalities' that reports the number of fatalities or causalities within that nonviolent campaign event. This ensures that fatalities or causalities within violent campaigns capture the escalation processes that are not the subject of interest. This variable captures the intensity of disorganised violence of interest. 'Fatalities/causalities' is defined 'by the number reported fatalities or causalities confirmed or estimated by the action' (Chenoweth, Pinckney, and Lewis 2018: 4). As mentioned, from a theoretical perspective this is by design a rare event. Thus as expected there is a high number of zeros see 4.1 where 99 per cent of the dependent variable consistents of zeros.

Figure 5.1 shows the fatalities or causalities between 2005-2012 on a weekly basis in the countries included in the sample. There are high number of fatalities in nonviolent campaign events from 2010 to 2012. Therefore, the data available is driven by the events of Arab Spring such as the cases of Egypt and Syria. However, it also captures some counties outside the sample such as China and Pakistan.

4.4.2 Internet penetration

This paper uses the replication data available by (Rød and Weidmann 2019) to look at sub-national measures of internet penetration. This based on previous work that use network traffic observation to estimate internet coverage (Weidmann et al. 2016; Rød and Weidmann 2019).

This is an appropriate measure as it can capture regional variation in countries, minimising the issues of ecological fallacy (Jargowsky 2005). Therefore sub-national measures of internet access are needed as the appropriate unit of analysis. Previous research relied on aggregate measures of internet access, such as using the Internet Telecommunication database (ITU) (Rød and Weidmann 2019). These types of database contain measures of the different aspects of ICT such as use and access to internet. There are also survey-based data such as the Demographic and Health Surveys (DHS) that include questions relating to technological access. However, these aggregate measure of the internet does not provide the appropriate unit of analysis. In addition, using such aggregate measurements can lead to ecological fallacy, where you make inferences at the higher group level is used to make an inference about the lower group level (Jargowsky 2005). Therefore sub-national measures of internet access are needed as the appropriate unit of analysis.

Figure 5.2 shows this problem. It shows internet penetration across the countries included in the sample. This shows that China has the highest internet penetration. However, looking at sub-national data shows major cities drive aggregate measures of Internet penetration. This shows the need for sub-national data to make more accurate inferences. Hence, I utilise the measure of *internet penetration* data estimated by computer scientists that measure network traffic observations to estimate internet coverage at the sub-national level (Weidmann et al. 2016).

This allows to see how well connected a certain location is which measures actual internet use and therefore is less subject to potential biases from other methods (Rød and Weidmann 2019). This method measures the data (packets) transmitted of the sender's information including their address and destination address. The measuring of internet traffic using traffic logs from a large Swiss internet provider, that looks at the origin addresses of all routed packets to the sub networks (Weidmann et al. 2016; Rød and Weidmann 2019). This information is then translated using a geolocation database to get GIS coordinates that are appropriate where the sender's address was located (Weidmann et al. 2016; Rød and Weidmann 2019).

This enables to use city-level measures at yearly time intervals of Internet coverage by using the number of active sub-networks within a 50-km radius of a city. As Weidmann et al. (2016) and Rød and Weidmann (2019) I use the logarithmized, per 1,000 capita number of sub networks as the indicator for internet penetration.

4.4.3 Repression

The second independent variable of interest is the role of repression in a protest week. This variable is operationalised as a dichotomous variable when repression occurred in the last week by the regime. This paper utilises the replication dataset that contains when the last week's protest has been repressed or not (Rød and Weidmann 2019). This captures the independent and dependent variable of interest at the city-protest week level as the main component of the statistical analysis control variables are also needed. The next section will talk about the appropriate control variables that are included in the models.

4.5 Control variables

Additional variables are included in the models to mitigate a spurious relationship between the independent and dependent variables due to omitted variable bias. This one needs to consider other factors that can also impact the dependent variable as the causal effect could be wrongly attributed to the independent variable of interest. However, a model should also be parsimonious and thus should not add too many variables as it can result in overfitting the model (Gelman and Hill 2018). Therefore a rule of thumb in including for control variable is that it should relate to the cause of the dependent variable and vary with the independent variable. I use controls appropriate at the city level that can impact the level of disorganised violence.

4.5.1 Population density

This paper controls for population density as areas with higher population density can increase the likelihood to protests. I use the replication data from Rød and Weidmann (2019) that use the population density from Lands can. LandScan is a spatial dataset that approximates the spatial distribution of the human population at a resolution of approximately 1 km. They aggregate the estimates within 5-km radius of the city centre. In addition, areas which have higher population density may also have higher access to the internet.

4.5.2 Capital cities

I also control for capital cities as a dichotomous variable. The reason for this is that capital cities hold political importance e.g. seat of national government (Rød and Weidmann 2019). Therefore, it is more likely that protests will occur in the respective capital cities which could potentially increase the likelihood of disorganised violence. I utilise the replication data of Rød and Weidmann 2019's variable of feature code mod which categorises the cities from its geonameid to capital or regional cities.[3] Since my sample contains all major cities in each country, I created a dummy variable of the feature code variable for when it is a capital or not.

4.5.3 Development

One issue when looking at internet access is that it is often spurious with the development of the city. I use a proxy for development from the replication data in the form of nighttime light emission per capita (Rød and Weidmann 2019). Controlling for development is important as it can also drive state internet expansion and protest behaviour, this allows to control for a spurious relationship between the internet and protest violence. Nighttime light is often used as an alternative measurement for economic performance (Henderson, Storeygard, and Weil 2011).

There are limitations in using nighttime light as a proxy for development as research has also shown that it overestimates in large urban areas and underestimates in rural areas (Rød and Weidmann 2019). However, as this paper is only interested in protests in cities (e.g. most areas are urban) thus the issue is limited as it does not compare rural and urban areas. Nighttime light can also be limited in differentiating the different levels of development between different cities so it can be hard to capture the variation of development across major cities across countries.

Due to a high correlation between nighttime light and population density, I ensure I put them in different models to avoid multicollinearity. See appendix A for 2 that shows the correlation plot between the variables. There are models which also use nighttime has been used as a proxy for population density, therefore I cannot use both in the same model.

3. See: https://www.geonames.org/manual.html for how cities are coded

4.6 Summary of all variables

This section outlines the summary statistics for all the variables of interest from the dataset. It only contains data on protest week within nonviolent campaigns. Table 4.1 provides an overview of the majority of the variables included in the dataset. The capital city and last protest repressed (protest week) are dichotomous variables that only take 0 or 1 values.

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Disorganised violence	917	0.091	2.174	0	0	0	65
Internet penetration	917	2.482	8.021	0.000	0.035	0.609	40.506
Population(5km centered)	917	0.964	0.671	−0.506	0.426	1.460	2.141
Nighttime lights	917	−0.606	0.509	−1.482	−0.984	−0.241	0.448
Last protest repressed	917	0.529	0.499	0	0	1	1
Capital city	917	0.335	0.472	0	0	1	1

Table 4.1. *Summary statistics of all variables*

4.7 Estimation technique

This section outlines the appropriate estimator that will be used in the paper. As previously discussed, the dependent variable is the reported count of fatalities/casualities that captures disorganised violence. Thus, one would need to employ a count model to estimate the relationship. One could fit an Ordinary Least Square (OLS) model using count data to see if there is a linear relationship.[4] However, count data is often discrete and is highly skewed distribution as 4.1 shows. Therefore, generalised linear models are often used to handle count data. There are different types of count models, the most typical one being a Poisson distribution which assumes the variance is equal to its mean. However, the presence of overdispersion and a high number of zeros makes it difficult to fit a Poisson count model. One could also fit a negative binomial or quasi-Poisson model to account for the overdispersion however due to the high number of zeros, a zero-inflated negative binomial regression is used.

A zero-inflated negative binomial regression is used as it attempts to take into account the excess number of zeros (Gelman and Hill 2018). As it assumes there are two kinds of zeros, true zeros and excess zeros and therefore it estimates equations one for the count model and one of the excess zeros (Gelman and Hill 2018). However, there also needs to be a theoretical explanation for why there are two data-generating processes that the model needs to take into account. I argue, that there are structural zeros from campaign events that have a low propensity to engage in violence. This should be differentiated from groups that are more prone to violence such as having radical or violent flanks within their movement, which can increase the risk of violence but do not at a specific point in time (Chenoweth and Schock 2015). In the second group, it takes the value of 1, it performs a negative binomial count of groups that are susceptible to violence. A zero-inflated model uses a logit inflation model that estimates the likelihood that a certain group will be in a not a risk group that has the true zero counts. However, this paper limits the main model to the count model's estimate with the zero inflation component available in appendix B.

4. See appendix B for the linear model shown in 3

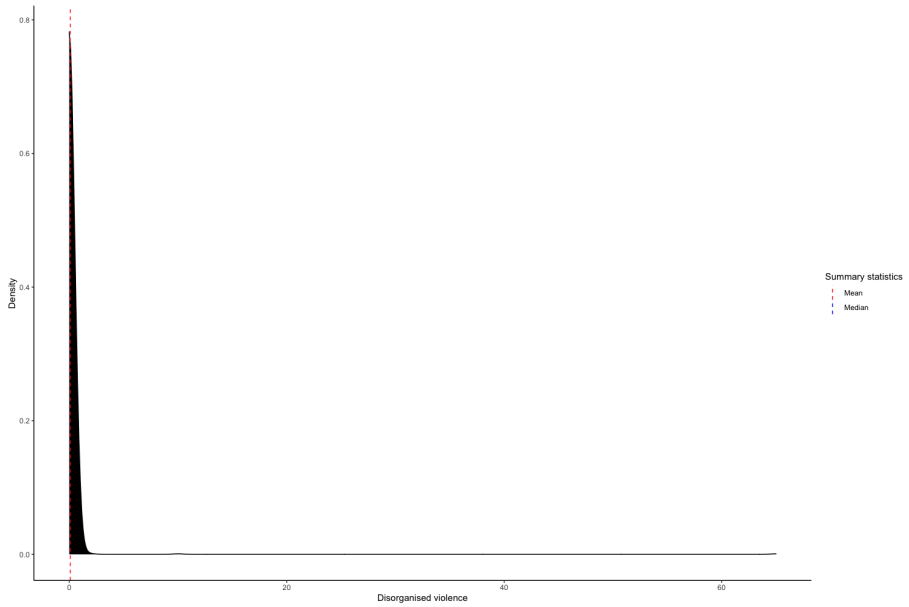

Figure 4.1. Density plot of fatal causalities events in nonviolent campaigns

The coefficients from the zero-inflated negative binomial regression show the change in the log of the expected count for one unit change in the independent variable (given the other predictors in the model are held constant e.g. cetris peribus). Therefore to interpret this I take the exponent of the coefficient estimates to get the incidence rate ratio (IRR), which provides the proportionate change in expected count given one unit change in the independent variable (cetris peribus).

5. Analysis

In this section, I look at whether there is a possible relationship between the role of the internet and dissident violence within nonviolent movements. First, I present descriptive statistics to look at the overall trend between internet penetration and the level of disorganised violence and identify any potential issues that can affect the statistical modelling. Then I present the zero-inflated negative binomial model to test my hypotheses. I also use alternative specifications for the models, in addition to model diagnostics. The last paragraph summarises the main findings from the models.

5.1 Descriptive statistics

Here, I present the descriptive statistics of the dependent and independent variables of interest. From the 971 observations at the city-protest week level, there are nine events where disorganised violence occurs in each protest week. In line with theory, it shows that within nonviolent campaigns that it is a rare event that occurs in certain cases. Below shows two figures 5.1 and 5.2 that show the variables of interest and how they vary over time. Both Y axis has been logged and transformed for aesthetic purposes. It is aggregated at the country level as the city level was difficult to display due to a high number of zeros and for comparison.

Figure 5.1 shows a weekly count of fatalities between 2005 to 2012. Most violent events occur after 2010 with it being driven by the cases of Egypt, Syria and Jordan. The graph is also useful as it shows the outlier cases such as the case of Syria in 2012 (weekid, 502) which can potentially drive the regression results where the number of fatal/causalities is 65. Figure 3.2 shows the internet penetration over time between 2005 to 2012. It shows there are outliers that have high internet penetration such as China in the sample. Another issue is that there is no data available for the case of China before 2010. One should also note that in big countries like China, internet penetration varies significantly by its major cities. Appendix A, in table 7 shows other smaller cities which may not have much lower internet access.[1] This further motivates why the internet access data is at the city level. This could also be a potential outlier that could drive the results. However, the other countries have similar levels of internet penetration. This could be due to the bias in the sample of countries as there is an oversample of countries from the MENA region which has similar levels of development. An interesting variation shown in figures 5.1 and 5.2 is that there is increased reported *disorganised* violence when there is a slight reduction in internet penetration. However, this is only speculative and the figures are hard to compare to draw inferences from. Thus one needs to turn to formal statistical modelling to conduct the hypothesis testing.

1. Upon further inspection of the data, it shows that smaller cities such as Hohot, have very low internet penetration (0.0452)

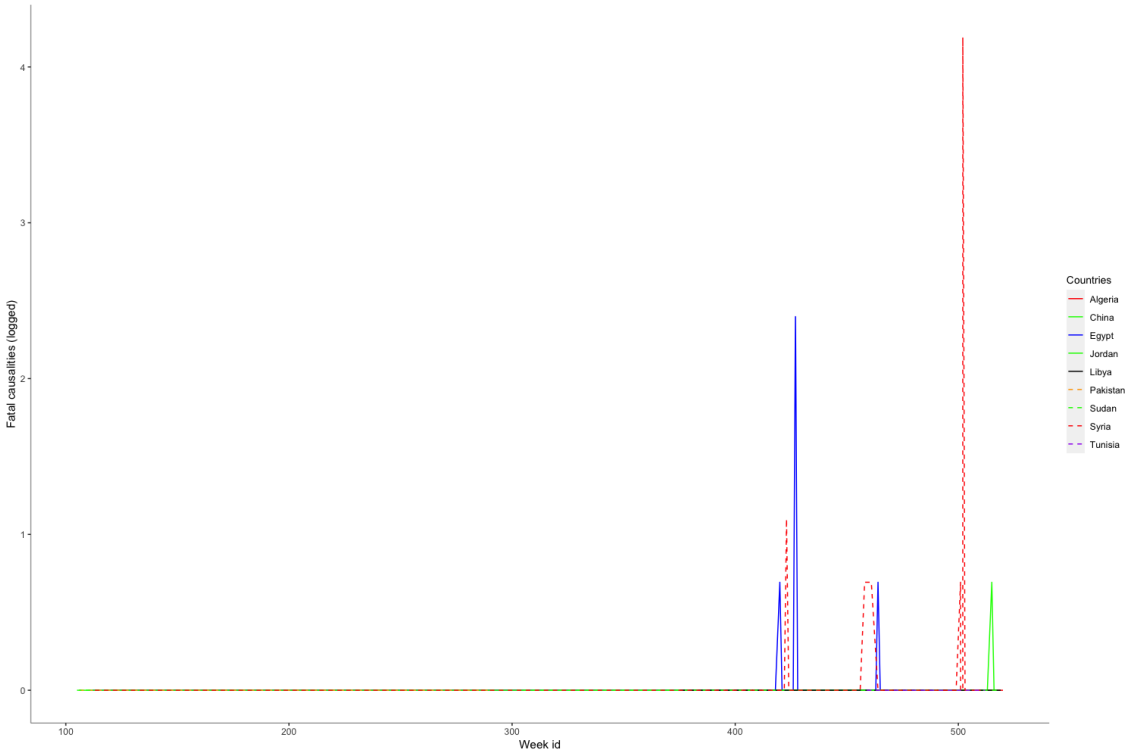

Figure 5.1. Fatal causalities between 2005-2012 in nonviolent movements

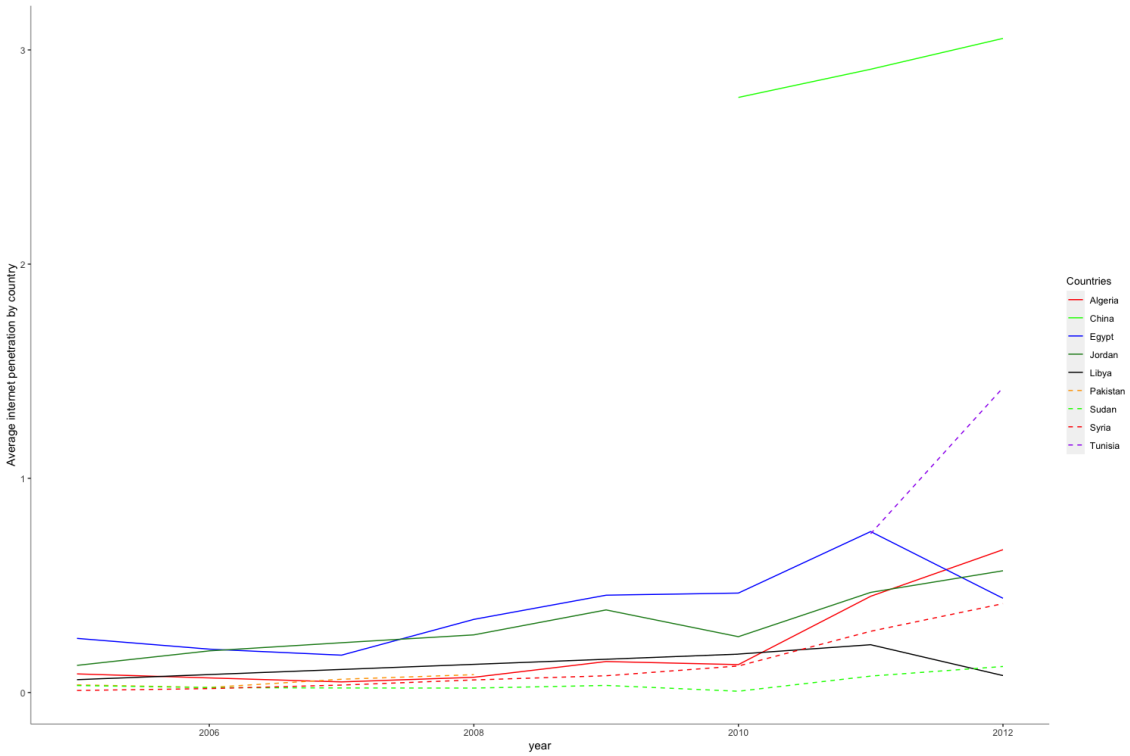

Figure 5.2. Internet penetration between 2005-2012

5.2 Statistical findings

In this section, I explore the hypothesised relationship between internet penetration and disorganised violence by estimating five zero-inflated negative binomial models. The regression output shows the count component (true zeros) of the zero-inflated negative binomial 5.1. The second part of the model, the logit model is presented in Appendix B, in table 8. The first model represents the simple bi-variate relationship, the second and third models show the relationship with control variables.[2] The fourth and fifth model test hypothesis 1.1, looking at when repression occurs in the last protest week and its interactive effect with the internet. The statistically significant coefficient in the models can be interpreted by taking the exponents of their coefficients.

Table 5.1 shows that in the first model, there is no statistically significant relationship between internet penetration and disorganised violence. However, the sign of the coefficient shows that it reduces disorganised violence in line with the proposed hypothesis. Nonetheless, there is no preliminary evidence that supports the proposed hypothesis that greater internet penetration reduces disorganised violence. However, when controlling for the capital city and nighttime lights or population density, internet penetration is shown to be significant across models two to five. Model two shows that internet penetration has a statistically significantly reduces disorganised violence by a factor of 3.672 at the 90 per cent confidence interval. The third model shows that internet penetration also statistically significantly reduces disorganised violence by 5.55 at the 95 per cent confidence interval. Capital cities are also shown to reduce disorganised violence by a factor of 43.34 at the 90 per cent confidence interval. This could be due to two factors, it could further support the mechanism as capital cities tend to have more media exposure that increases international or domestic audience cost or it could be due to reporting bias as mentioned in the research design. Overall, this does lend support to the proposed hypothesis, that increased internet penetration can reduce disorganised violence as it is consistently significant across both models with controls and therefore reject the null hypothesis. Considering the overall fit of the model, the Log likelihood statistic and AIC[3]show that it has improved with the inclusion of control variables.

Models 4 and 5 look at testing hypothesis 1a to look at the relationship between when repression and internet penetration on disorganised violence. Both model 4 and 5 shows that internet penetration is statistically significant at the 99 per cent confidence interval and reduces disorganised violence by a factor of 19.55 and 15.65 respectively (also shows that it is a spurious relationship with the other controls), thus lending support for the first hypothesis. Model 4, shows that when repression occurred during the last protest week it reduces disorganised violence by a factor of 44355 which is statistically significant at a 99 per cent confidence interval. This is also in line with the theory that state repression can discourage disorganised violence. The interaction between internet penetration and repression shows that it increases disorganised violence which is statistically significant at the 99 per cent confidence interval. This show does not show support the hypothesis, that when internet penetration increases and repression occurs it can decrease disorganised violence. However, there could be alternative explanations that explain this variation, this will be discussed in chapter 6. Therefore I fail to reject the second part of my hypothesis.

2. as mentioned in the research design, population density and nighttime lights are controlled for in separate models due to high multicollinearity

3. The Akaike Inf. Crit shows model fit statistics that penalise for additional values and decreases to indicate an improving model fit.

Table 5.1. *Zero inflated negative binomial regression*

	Dependent variable:				
	Disorganised violence				
	(1)	(2)	(3)	(4)	(5)
Internet penetration	−1.005	−1.301*	−1.714**	−2.973***	−2.751***
	(0.638)	(0.725)	(0.761)	(0.906)	(0.907)
Population density		−2.132		−9.507***	
		(1.684)		(2.805)	
Night time lights			3.724		10.503***
			(2.298)		(3.208)
Capital city		−3.281	−3.769*	−4.840***	−4.069*
		(2.091)	(2.045)	(1.824)	(2.087)
Last protest repressed				−10.779***	−9.143***
				(3.316)	(2.871)
Internet* repressed				20.791***	16.776***
				(6.021)	(4.872)
Constant	−0.706	3.228	4.412	17.502***	12.699***
	(0.982)	(3.315)	(3.317)	(5.762)	(4.333)
Observations	917	917	917	917	917
Log Likelihood	-66.726	-60.046	-58.164	-51.263	-51.345
Akaike Inf. Crit	143.452	134.912	134.328	128.527	128.689
Note:					*p<0.1; **p<0.05; ***p<0.01

Overall, the main model shows support for the first hypothesis as it shows that there is a statistically significant reduction in disorganised violence across all models shown in table 5.1. Thus it provides tentative support that greater internet penetration can reduce disorganised violence due to audience costs that makes nonviolent dissidents more committed to their nonviolent goal. To look at the second part of the hypothesis, the model shows that internet penetration can significantly increase disorganised violence when repression occurs during the last protest week. This does not support the direction of my proposed hypothesis other explanations such as the role of emotions or severity of repression can explain this variation (Steinert-Threlkeld, Chan, and Joo 2022; Collins 2009). One should note that this model is limited as it looks at when repression occurs or not as mentioned in the research design section 3.4.3. The literature also highlights that the level and type of repression are also important therefore the effect could be different depending on this (Steinert-Threlkeld, Chan, and Joo 2022). This is further discussed in the discussion section with regard to the limitations of the study.

As mentioned, in the research design that there are extreme values that could be driving the regression results. In the next section, I evaluate the performance of the zero-inflated negative binomial model and remove the outlier case in my model as a robustness test. Then I take into account what implications this has in relation to my theory and highlight the potential limitations of my main model.

5.3 Count model diagnostics and robustness test

When interpreting the regression results, one must also examine whether it is the most appropriate model for the data. Therefore, this section seeks to evaluate the appropriateness of choosing the ZINB, the overall fit of the model, the presence of extreme values and also multicollinearity (as mentioned in the research design, there is collinearity between nighttime lights and population density therefore it was in reported in separate models).

The negative binomial model was selected due to overdispersion that is present in the dependent variable. Otherwise, a Poisson model would be the most appropriate where it assumes that the variance equals the mean. However, the Poisson distribution is based on the assumption that variance equals the mean which is not common in real-world data (Gelman and Hill 2018: 114). I check for overdispersion based on Gelman and Hill (2018) for the fitted Poisson model which indicates that it is statistically significant.[4] This test shows that there is overdispersion present in the data and thus a Poisson model is not appropriate. To see if a standard negative binomial regression is more appropriate, I conduct a likelihood ratio test (LRT)(Zeileis and Hothorn 2002). The LRT test assesses the null hypothesis that the model with fewer degrees of freedom is better (Zeileis and Hothorn 2002). The results are presented in the appendix that the null hypothesis is rejected and data is more appropriate to model under negative binomial distribution than a Poisson model. The appendix also presents the models fitted for a Poisson and negative binomial model (reference tables 6.8 and 6.6).

The next step is to see if zero inflation is present in the data and whether a zero-inflated negative binomial model is more appropriate. I conduct the Vuong test to compare the standard negative binomial and zero-inflated model (Kleiber and Zeileis 2016). This test looks at whether the null hypothesis is modelled equally well based on the maximum likelihood (Kleiber and Zeileis 2016). The Vuong statistics show that the zero-inflated model is more appropriate than the standard negative binomial model.[5]

A more intuitive way to show the goodness of fit to compare between the models is to present them in the form of rootograms (Kleiber and Zeileis 2016). Rootograms compare the observed frequencies and the fitted frequencies as the red line where the horizontal reference shows the difference between the observed versus fitted frequencies (Kleiber and Zeileis 2016). Figures 5.3 and 5.4 show rootograms that intuitively present the goodness of fit across different count models (Gelman and Hill 2018). The rootograms show the fitted models with all control variables (separate for models 4 and 5 due to different control variables). Both models show a perfect fit for the count 0 in both figures 5.3 and 5.4 however, this is common with data with too many zero values (Gelman and Hill 2018). In 5.3 shows that the negative binomial over predicts with counts 1 much more than the zero-inflated model. This shows that the zero-inflated model is an appropriate model as shown in 5.1. Figure 5.4 model 5 shows also shows that the negative binomial model over predicts much more than the zero-inflated. Hence, the analysis of the goodness of fit shows that a zero inflated model is the most appropriate model and table 5.1 presented is not distorted due to choosing an improper model.

4. I conducted a form over dispersion test, which showed that it was overdispersed by a factor of 23.99 statistically significant at the 90 per cent confidence interval

5. The AIC-corrected shows that z = -1.9262, with $p < 0.01$

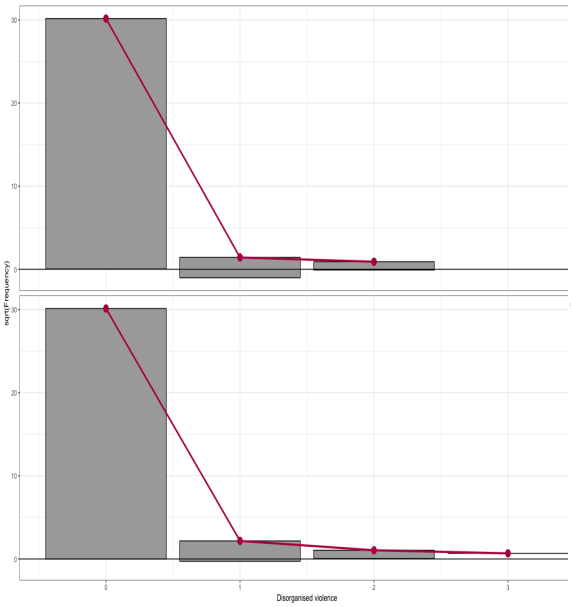

Figure 5.3. Rootogram for model 4

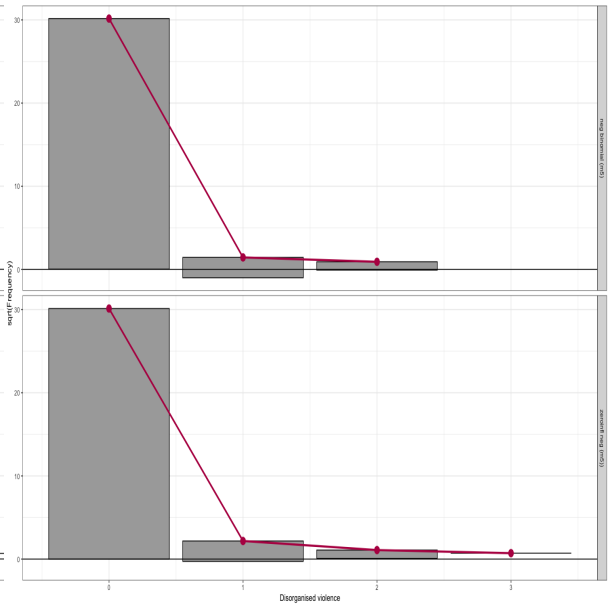

Figure 5.4. Rootogram for model 5

In addition, I also compare Appendix B also presents rootograms with the Poisson models. It shows that the standard Poisson model in 3 over predicts the 0 counts and over-predicts 1 and 2 counts. When taking into account the excess zeros, figure 3 and 4 shows a better fit for the model. However, the zero-inflated negative binomial shows a more appropriate fit than the zero inflated Poisson model. Therefore, the rootograms also support that the use of zero-inflated negative binomial model was the most appropriate model shown in table 5.1.

This section has shown that the zero-inflated negative binomial model was the most appropriate model compared to other count models. The standard Poisson model was shown not to be the best fit due to overdispersion present in the data. Taking into account, the overdispersion, the model was also re-run with the standard negative binomial regression. This shows a better fit however it still overpredicts without taking into consideration the excess zeros present in the data.

In addition, I also look at the issue of multicollinearity between my independent variables. Multicollinearity can be an issue as it can lead to increased standard errors and inflated precision of the estimates. As mentioned before, I put the variables population and nighttime lights in different models due to high collinearity between them as shown in Figure 2. The correlation between other variables has very lower correlation scores, this means that multicollinearity is not an issue in the models presented.

5.3.1 Adjusting for extreme values

In this section, I adjust the regression for possible extreme values that could be driving the regression results presented in 5.1. It is important to consider the difference between outliers present (versus outliers) and influential cases that could be present in the regression model (Kellstedt and Whitten 2018). As figure 5.1 shows that there are extreme values such as Syria which has 65 recorded 'fatalities/causalities', which indicates that extreme values are present. In order to see

the effect these influential cases have on the regression results, I have re-run the models to adjust for extreme values as shown in table 5.2.

One way of adjusting for extreme values is by winsorizing the dependent variable. This is a way of treating outliers by altering their values to be close to the sample values. This means you can adjust the uni-variate outliers by a given percentile and set it to an accepted value (Gosh and Vogt 2012). To winsorize, I transformed the statistics of the dependent variable by limiting the values to the 99.9 percentile, this set my dependent variable to the accepted value.[6] This allows to reduce the effect of any extreme values without dropping values. Another way you can adjust for extremes is by 'trimming' where you can eliminate influential cases that are identified by Cook's Distance (Gosh and Vogt 2012). However, due to a limited number of non-zeros, I choose to 'winsorize' to adjust for extremes rather than dropping an observation. Then I re-ran my model and it reported in 5.2.

Table 5.2 does not show support for my proposed hypothesis when adjusted for extreme values. Across all models my independent variable of interest is not statistically significant, this shows that the regression results reported in 5.1 is driven by extreme values. In addition, the effect of repression and the internet is also not statistically significant across models 4 and 5. This show that my main model is limited and my hypotheses are not supported when taking into account extreme results. The log-likelihood score and AIC also improve in the winsorized model indicating more robust standard errors compared to the main model presented in 5.1.

However, the control variables are significant. Models 2 and 4 show that population density is statistically significant at the 99 per cent confidence interval and has changed coefficient signs, showing that it increases disorganised violence. In addition, it shows that nighttime lights are also statistically significant in reducing disorganised violence across models 3 and 4. Similar to the main model shown in 5.2 that capital cities remain statistically significant in reducing disorganised violence at the 90 percent confidence interval across all models. Overall, the adjusting for extreme values does not support my proposed hypothesis and therefore I fail reject the null hypothesis.

However one should note the limitations of winsorsizing as a robustness check, as you set an arbitrary way to impute for extreme values. Therefore can be problematic, especially with count models as the extreme value can also be of interest and may severely bias the results by removing important observations or artificially changing values. Recent research has looked to alleviate this problem by using an extreme value and zero-inflated negative binomial models (EVZINB) (Vegelius and Randahl 2022). This type of model is an extension of the ZINB but deals with issues caused by extreme values by including a separate component for the extreme values. They highlight the limitations of winsorizing as its arbitrary exclusion or inclusion of data. This approach allows the researcher to draw conclusions about which factors can influence the 'extremeness of values' (Vegelius and Randahl 2022: 1). Their model in line with the ZINB logic seeks to extend this logic where excess zeros and extreme values are modelled separately, where the third component regression can be seen as a regression model with latent states (sub-processes from which data is generated) (Vegelius and Randahl 2022: 4). Their paper shows that it leads to stable and less biased parameter estimates for each process.

6. Only one value was winsorisized, extreme value of Syria

Table 5.2. *Zero inflated negative binomial regression, winsorized*

	Dependent variable:				
	Disorganised violence				
	(1)	(2)	(3)	(4)	(5)
Internet penetration	−0.615	−0.160	0.028	0.323	0.469
	(0.574)	(0.467)	(0.473)	(0.638)	(0.619)
Population density		4.974***		8.517**	
		(1.596)		(3.629)	
Night time lights			−6.334***		−9.624***
			(1.928)		(3.604)
Capital city		−2.776*	−2.857*	−2.844*	−2.928*
		(1.537)	(1.512)	(1.570)	(1.515)
Last protest repressed				0.569	−0.209
				(2.789)	(2.252)
Internet* repressed				−8.028	−5.606
				(7.001)	(5.416)
Constant	−1.898**	−8.954***	−8.015***	−13.209**	−10.369***
	(0.860)	(2.158)	(1.772)	(5.266)	(3.485)
Observations	917	917	917	917	917
Log Likelihood	-62.536	-53.464	-53.531	-49.173	-49.685
Akaike Inf. Crit	143.452	124.927	125.062	124.346	125.370
Note:					*p<0.1; **p<0.05; ***p<0.01

5.4 Concluding remarks

The first section compared different count models and their assumptions to see whether the zero-inflated negative binomial was the most appropriate fit for the data. It showed that the use of the zero-inflated negative binomial model is the most appropriate model based on over-dispersed distribution and also excess zeros present. Next, I looked at the effect of extreme values in my regression model by replacing my extreme values with less extreme ones. It showed that my main results were driven by extreme values that influenced the direction and significance of the coefficients. Therefore, my findings are limited as it shows that it may be one case that causes the significant relationship as proposed in the main model in table 5.1.

However, one can conclude that the regression is driven by the extreme value that shows support for the hypothesis. The descriptive statistics show that it was the case of Syria that resulted in the extreme value. One should note that the sample also includes cases where civil war has broken out, which could be a possible explanation for the extreme value in violence that needs to be considered. This could be a problem due to operationalising and assuming that the violence within the nonviolence campaign is due to violent events related to civil war outbreaks. The next section will discuss these findings, and reflections and provide some alternative explanations.

i

6. Discussion

The previous chapter presented the analysis of the main statistical findings and robustness tests by adjusting for extreme values. This chapter will discuss the results and implications of the proposed theory and hypotheses. I also reflect on the limitations of the research design and discuss how it has impacted the validity of the presented findings in chapter 5. Finally, I also discuss broader theoretical implications and present some alternative explanations.

6.1 Interpretation of the main finding

Based on the theoretical underpinnings of nonviolent theory, I argued that greater internet access should reduce disorganised violence intensity within nonviolent campaigns as it reduces their campaign success. From this, I proposed the hypothesis (H1a) that highlights that increased internet penetration reduces disorganised violence within civil resistance campaigns. The main model presented in the table 5.1 shows support for this relationship, as the direction is negative and statistically significant across most models. Therefore, this does provide some support for the direction of the relationship and the null hypothesis can be rejected in my main model. However, when taking out extreme values in the model through winsorization, I found no significant relationship between internet penetration and disorganised violence. Taking both of these models into account, this provides some support for my proposed hypothesis but it shows it is driven by one extreme case that needs to be taken into account for the generalisability of the results.

Based on the theory of nonviolent strategy, one would expect a reduction in disorganised violence when there is greater internet access due to increased audience costs. The theoretical argument is briefly repeated here, to understand the implications of the finding. Previous research argues any type of violence used within nonviolent campaigns is highly costly to dissident's goals and therefore they maintain their nonviolent strategy to gain political concessions (Chenoweth and Ulfelder 2017). This shows that communication networks are important in nonviolent dissident campaigns and can mitigate disorganised violence. Within the scope of nonviolent tactics, increasing internet access can increase audience costs for nonviolent dissidents and therefore can reduce the disorganised violence due to both international and domestic audience costs. Therefore, these findings can only provide tentative support for the direction of the relationship. However, the findings presented here cannot provide evidence for the proposed causal mechanism as it cannot be proved with a large-N study.

However, when considering the results when adjusting for extreme values it shows that there is no significant relationship between the proposed hypothesis. In addition, it was previously mentioned that it was driven by the case of Syria. Further research should be conducted in this case to explore the factors of the relationship in Syria.

Looking at the second part of the proposed hypothesis proposes that greater access to the internet when repression occurs can decrease the disorganised violence within social movements.

My main model showed that it significantly increased disorganised violence. This is not in line with my proposed hypothesis and theory. I argue that when repression occurred nonviolent dissidents would use political jiujitsu to generate backfire and thus maintain their commitment to nonviolence (Sutton, Butcher, and Svensson 2014). Nonetheless, the relationship is significant, opening up alternative explanations that can drive this interactive effect. One factor, that was not considered in this study, is the different types of repression that could also mediate this effect. As research has shown highly severe repression can demobilise protest movements whereas lower ones can increase mobilisation (Steinert-Threlkeld, Chan, and Joo 2022). In addition, indiscriminate repression has also been highlighted as increasing violence that has not been taken into account in the model (Della Porta et al. 2018). However, when adjusting for extremes, there is no relationship between repression and its interaction effect with the internet. Thus, it also shows that this relationship is driven by an extreme case and, therefore, one can argue that the unreliability of this interactive effect is limited. As mentioned before, a quantitative study cannot test the causal processes, the effect could be due to other alternative explanations driven by extreme cases. Overall, these findings above only show limited support for the first part of my proposed hypothesis.

In addition, to the main findings with regards to the independent variables of interest, there are also other findings that are worth noting. Based on previous research one would expect capital cities to have an increased risk of disorganised violence as more people are likely to mobilise. However, the models presented in 5.1 and 5.2 show a significant decrease in disorganised violence within social movements. This is presented across both the main model in table 5.1 and 5.2. This shows that these findings are robust and not driven by extreme cases. However, there is also potential it could also be in line with the proposed theory as capital cities also have an increased audience cost through increased media reporting that dissidents are aware of. However as I cannot directly test the causal mechanism, I cannot conclude support for the proposed theory. This needs to be explored further to explain why in capital cities there is a reduction in disorganised violence using a case study design.

Overall, there is limited support for the proposed hypotheses about the role internet has on dissidents' decision to use violence. This is shown as there is support within the main model but is limited once winsorizing extreme values.

6.2 Limitations and reflections

This section will highlight some reflections on the choice of research design and the implications it may have had on the results. In addition, it will also highlight broader theoretical implications and alternative explanations.

6.2.1 Research Design

As Chenoweth, Pinckney, and Lewis (2018) highlights, one of the trade-offs that occurred was having a limited sample that captures the event of interest versus a large but more heterogeneous sample. Due to resource constraints, the NAVCO 3.0 database was over-sampled from the MENA

and Africa region and also in part due to interest from the researchers and regions that are sampled (Chenoweth, Pinckney, and Lewis 2018). In addition, the aim was to understand popular uprisings within the sample period therefore they highlighted that the sample present within NAVCO could potentially be more 'eventful' than the global average. This trade-off is also present in this study which explains the inherent bias within the sample of cases.

Upon reflection due to time constraints when merging the data, more observations could have been kept. In order to create the data set at the city level, I used a python package which dropped cities that were not named correctly to get the longitude and latitude.[1] However, if there was more time, one could obtain a larger sample by manually cleaning the strings of localities to its appropriate city name and thus potentially have a larger number of observations.[2] However, this will not alleviate the inherent bias from the NAVCO 3.0 dataset as it over samples from the MENA and African region that are popularly represented as inherently violent (Chenoweth, Pinckney, and Lewis 2018). Therefore, trade-offs exist between attempting to capture a global sample of nonviolent campaigns versus capturing a limited sample that captures the phenomenon. Thus, one needs to consider the effects this has on the generalisability and validity of the findings presented in the study.

As mentioned, in the research design section there were limited data available to be able to study all the population in the universe of cases. One advantage of using a large-N study is that there is generally a high degree of generalisability and external validity that can be applied to other nonviolent protest movements (Kellstedt and Whitten 2018). However large-N studies tend to have lower internal validity (Kellstedt and Whitten 2018). Therefore, considering the limited sample of this study, one must highlight its bias toward the Middle East and Africa region that captured the Arab spring movement. As highlighted before, Syria as an extreme case in the period of the civil war could have a potential bias in the model. This can be problematic for drawing generalisable conclusions from the model. However, there are some cases compared that are outside of this region such as China and Pakistan. Therefore, there is a degree of generalisability and external validity but it is limited due to data availability.

In addition, the validity with regards to the main variables should also be discussed and the limitations it can have. The theoretical logic of using ´fatal/ causalities' from the NAVCO 3.0 dataset was the assumption that violence that occurred within nonviolent campaigns was inherently *disorganised* (Chenoweth and Ulfelder 2017). However, one can question whether this assumption holds therefore using the variable of 'fatal/causalities' as a way of measuring disorganised violence could be limited as it may capture organised violence. As previously mentioned, this could also be problematic when capturing events where civil war has occurred which also needs to be taken into account. Future research should also take this into account.

However, the decision to use this operationalisation was that it was the main way to capture levels of violence within nonviolent campaigns. Ideally, data collected which categorised the type of violence such as riots would have been the most appropriate within campaign events that are categorised as nonviolent. One should note that there are other databases that capture riots such as ACLED, as mentioned in the research design, it does not capture the type of protest campaign (Raleigh et al. 2010). However, due to limited data availability in capturing this phenomenon,

1. See appendix A for the appropriate python package
2. In addition, further inspection of actor side should also be considered when sub-setting the dataset.

I assumed that the violence reported within nonviolent campaigns was disorganised by nature. Nonetheless, this is important to highlight as it could possibly bias the findings and therefore implications it can be drawn from.

More recent studies have also highlighted the importance of having disaggregated, to a daily level (Chenoweth and Ulfelder 2017; Rød and Weidmann 2019). Due to limited data, the findings presented here are at the weekly level. However, data available at the daily level would be ideal to be able to study the micro dynamics of the increase of violence within nonviolent movements.

Another issue highlighted before within the research design section was the use of news report-based event data (Weidmann 2016). I will briefly repeat the reporting bias issue and highlight how it has affected the findings shown in the paper. Reporting bias has affected the findings in two ways: first through under-reporting a smaller number of fatalities and bias towards reporting from capital cities. Weidmann (2016) highlights reporting bias and how it can affect the demand and supply of reporting. This highlights how lower causalities are often underreported, this could an important source of bias inherent in the data due to the large number of zeros that are reported. The issue with news reports is that fatalities or causalities are only reported if deemed newsworthy, therefore, events with a high number of fatalities tend to be reported compared to when there are 1 or 2 counts of fatalities. Therefore, due to reporting bias in the data, there could be incongruence with regards to the observed data collected versus what occurs in reality. However, this is a common problem within any data set especially those reporting on fatalities.

Second another potential issue of reporting bias is that event reports tend to occur from capital cities, therefore there could also be a source of over-reporting from capital cities compared to other cities. Media outlets tend to be based within the capital city of the country compared to other smaller or regional capital. This needs to be taken into account when presenting the findings as the event data inherent with the NAVCO data could have more disorganised violence reported within capital cities compared to others (Chenoweth and Ulfelder 2017). This highlights the issue that, disorganised violence that occurs in smaller cities goes underreported causing potential bias. The sample shown in table 7 shows that the majority of the sample included cities that were not the capital of the country apart from Algeria. Taking into account this, the reporting bias which highlights that fatalities tend to be reported from the capital cities of the country. Therefore another source of bias that needs to be considered is that there is probably underreporting of disorganised violence in smaller cities.

Another issue could be the presence of endogeneity that may be present. From a theoretical perspective, the level of internet access could be determined by the infrastructure and development of the country. This could also impact dissidents' likelihood to protest and their decision to use violence. However, since the data is at the city level the issue of endogeneity is limited as the sample includes major cities which are assumed to have relatively developed. This would be a bigger issue if comparing urban and rural areas but this is not within the scope and aims of this paper.

In addition, the choice to use a zero-inflated negative binomial model as the estimator can be questioned. This was based on a theoretical explanation for excess zeros that explains the two data generating processes and the overdispersion that exists in the data. As previously mentioned, the ZINB also performed the best in terms of the overall goodness of fit. However, more recent

studies proposed using the Extreme Values Zero Inflated model (EZINB) which extends the ZINB model capturing when extreme values are present (Vegelius and Randahl 2022). As highlighted in the analysis, when adjusting for extremes the imputation is artificial and arbitrary. Therefore, if I had more time I would have also run an EZINB model to account for the extremes rather than winsorization that could take into account the extreme values shown in the data. This could provide more robust results that take into account extreme values present in the data. Vegelius and Randahl (2022) show that the EZINB also performs better with improved AIC and log likelihood scores than other forms of adjusting for extremes.

In evaluating the goodness of fit, the model presented was kept simple with a limited number of controls. Literature highlights that there is a tension between specifying a model that can capture the complexities present in the real data and keeping it parsimonious (Kellstedt and Whitten 2018). In addition, literature has also highlighted the limitations of null hypothesis testing. This is important as it highlights the difference between explanatory versus predictive modelling. If there was more data available across time that could capture multiple peaks of fatalities then one could conduct an out-of-sample predictive performance test as part of a robustness test (Ward, Greenhill, and Bakke 2010). In addition, more recent studies have highlighted that predictive performance can provide greater support for the proposed causal mechanism (D'Orazio 2020).

As mentioned previously, the findings presented here are limited in relation to the direction but they cannot provide evidence for the causal mechanism that is proposed. Although there is some evidence in relation to the proposed direction, it is difficult to draw conclusions about the causal mechanism. Further research using qualitative methods needs to be conducted to provide evidence for the claims based on the causal mechanism.

6.2.2 Theoretical implications and alternative explanations

This section seeks to explore the broader theoretical implications of the findings presented. It also highlights alternative explanations that need to be taken into account and highlights the limits of the findings presented.

As mentioned in the additional findings section, capital cities were shown to have a significant and robust reduction in the level of disorganised violence. From a theoretical perspective, large protests tend to occur in the capital cities of the country due to the national political status that it holds. Therefore, anti-regime protests tend to be concentrated in the capital cities as it holds the national office of government. In addition, capital cities tend to have higher population density and make it more accessible for dissidents to mobilise. One would expect that there could be a possible increase in disorganised violence that occurs within capital cities as dissidents are most likely to mobilise. However, the findings presented show that there is a significant reduction in disorganised violence. This could also be explained by the nonviolent literature as dissidents would want to maintain their legitimacy of nonviolence (Chenoweth and Ulfelder 2017; Sharp 1973). As previously mentioned, capital cities tend to have more media coverage which can increase audience costs for nonviolent dissidents. As this finding is found across both the main model and the model where it is adjusted for extremes, it can be shown to be a robust finding. This is can provide some evidence that there are structural factors which can shape nonviolent dissidents' decision to use violence. This goes against the literature which argues that disorganised

violence within nonviolent campaigns is random or spontaneous as it does not consider the logic of using disorganised violence. However as mentioned in the limitations, this finding could be driven by a reporting bias that is inherent in the data. Therefore, further robustness tests could be conducted and highlight the extent to which this relationship holds.

An alternative explanation that could also explain the increase in disorganised violence is the *severity* of repression. As mentioned the different types of repression have been overlooked in this study when considering the second part of the hypothesis. This study considered when repression occurred in the last protest week as a dichotomous variable. Literature has highlighted that the type of repression that occurs is also important. The different types of repression can impact, the level of violence Della Porta et al. (2018) highlighting the more indiscriminate form of repression can increase the likelihood of protester violence that could potentially lead to escalation of protest violence. In addition, other research has looked at how the severity of repression can affect future mobilisation. (Steinert-Threlkeld, Chan, and Joo 2022) also highlights how the severity of repression can also affect future protest likelihood. They highlight that low levels of repression can trigger more mobilisation compared to high levels of repression which can demobilise protests. This highlights potential alternative explanations for the second part of my hypothesis. Future research also needs to take into account how the severity and type of repression can also impact disorganised violence as it affects how likely people are to protest

In addition, research has also looked at how greater internet access can also affect how the type of state repression. Research has shown that higher internet access can also affect how targeted state repression and therefore areas with more limited access experience more indiscriminate campaigns of violence (Gohdes 2020). Therefore, future research should also take this into account when looking at the effect of the internet on disorganised violence as its type of repression can impact dissidents' choice to use violence. This has not been explored in this thesis but it is important to note that different types of repression can also impact the dissident's violence in social movements.

Another point to consider is that this study only looks at internet access between 2005 to 2012. As Rød and Weidmann (2019) highlights, the internet has changed over time, it has become cheaper and easier to access than before. They also highlight in their findings the role of autocratic regimes using digital means to repress the onset of anti-regime movements (Rød and Weidmann 2019). In the long run, more autocratic regimes are also employing digital means of repression and surveillance to quell civil resistance movements (King, Pan, and Roberts 2017; Rød and Weidmann 2019). Future research should also consider these impacts within the research of Nonviolent Resistance.

Overall, this section has discussed the theoretical implications of the findings presented in 5.1. In addition, it has also re-evaluated the operationalisation of variables in the research design. It has also highlighted how assumptions made in the theory can impact the operationalisation of the dependent variable and how it limits the findings of the model presented. Finally, it has discussed alternative explanations that drive my results and how provided future avenues for research.

7. Conclusions and recommendations

This thesis has explored how greater internet access can affect disorganised violence within nonviolent campaigns. This thesis contributes to the wider modernisation theory that argues technological changes can lead to democratisation and liberal peace. Previous research highlights how modernisation can contribute to the onset of nonviolent movements. However, research has not looked at how the internet can mitigate disorganised violence within nonviolent social movements.

Based on emerging literature on the use of disorganised violence in nonviolent movements, I asked how greater internet access can impact nonviolent dissidents' decision to use violence. Based on nonviolent theory, I argue greater internet access would reduce the intensity of disorganised violence as dissidents would be more exposed to international and domestic audience costs. I also argued when the state uses repression, nonviolent dissidents would use political jiujitsu through digital means and maintain their commitment to nonviolence. Thus, I hypothesised that with greater access to the internet, there would be a reduction in disorganised violence.

To assess the proposed hypotheses, I merged data at the city-week level capturing all nonviolent campaign events with sub-national data on internet access between 2005-2012 (Chenoweth, Pinckney, and Lewis 2018; Rød and Weidmann 2019). The initial descriptive analysis over time shows that their disorganised violence is a rare event. Then I employ a zero-inflated negative binomial model to test my proposed hypothesis. The results of my main model indicate support for the first part of my hypothesis. However, I do not find support for the second part of my hypothesis, instead, the direction indicates it increases disorganised violence. Therefore, there is some support for the proposed theory.

In addition, I also conducted robustness checks by adjusting for extreme values present in my data. From this I found my proposed hypotheses not to be supported, this shows that the extreme case of Syria drives the proposed hypothesis. I highlight this could be due to internal validity issues of my dependent variable that captures other types of violence. Thus, the findings presented in this thesis are limited and further scrutiny of the data is needed to show test the proposed hypotheses.

An additional finding highlighted in this paper is that there was a significant decrease in disorganised violence in capital cities across the main and adjusted model. I argue this could provide tentative support for my proposed theory as protests in capital cities can have more audience costs due to greater media coverage. Thus, nonviolent dissidents would want to maintain their commitment to nonviolence. However, this is a limited finding as the data is inherently biased towards cities. In addition, there are also major issues with overreporting violence in major cities than in smaller ones. Thus, this finding is extremely limited and future research needs to be conducted with a diverse sample of cases. Although the findings presented in this thesis are limited, it opens up future research avenues to test the proposed theory using alternative research designs. Future research on this topic is essential as the consequences of increased digitisation need to be considered in contentious politics.

Using qualitative case study analysis to look at the extreme case to see if there is support for the causal mechanism is one way. In addition, in order to look at this phenomenon, one would also need more granular data that captures it at the daily level. Due to resource constraints, I aggregated the data weekly; however, looking at daily changes could also provide some more insights into the micro dynamics of nonviolent movements.

Another interesting research question that could be explored in future research is to look at how internet access can affect campaign success. This paper assumes that nonviolent dissidents would not use disorganised violence as it can reduce the chances of success. However, the relationship between internet access and campaign success has not been explored yet using a large-N design.

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Appendices

Appendix A

Continents		
Asia	Middle East	Africa
China (26) Pakistan (19)	Egypt (21) Jordan (9) Syria (11)	Algeria (8) Tunisia (4) Sudan (22) Libya (7)

Table 1. *Sample of countries*

Countries								
China	Pakistan	Egypt	Jordan	Syria	Algeria	Tunisia	Sudan	Libya
Wuhan	Sukkur	Damietta	Irbid	Aleppo	Algiers	Tunis	Wad Medani	Tripoli
Suzhou	Quetta	Suez	Amman	Damascus		Manouba	Omdurman	Tunis
Shanghai	Multan	Cairo	Annaba	Latakia		Ben Arous	Nyla	Manouba
Pudong	Larkana	Alexandria				Ariana	Port Sudan	Ben Arous
Ningbo	Karachi						El Obeid	Tobruk
Neijiang							Khartoum	Benghazi
Lanzhou								
Yangjiang								
Hangzhou								
Handan								
Guangzhou								
Beijing								
Tngliao								
Hothot								
Chifeng								

Table 2. *List of cities included in sample*

MERGING THE DATASETS: latitude and longtitude

```
[173]: import geopy
       from geopy.geocoders import Nominatim
       import geocoder
       import pandas as pd
       import numpy as np
```

```
[56]: path= '/Users/forogh/Library/CloudStorage/OneDrive-Uppsalauniversitet/second year/Masters Thesis/data_real/'

      df = pd.read_csv(r'test_nv3.csv')
      morocco = pd.read_excel(r'morocco.xlsx')
      algeria = pd.read_excel(r'algeria.xlsx')
      tunisia = pd.read_excel(r'tunisia.xlsx')
      sudan = pd.read_excel(r'sudan.xlsx')
      egypt = pd.read_excel(r'egypt.xlsx')
      libya = pd.read_excel(r'libya.xlsx')
      syria = pd.read_excel(r'syria.xlsx')
      jordan = pd.read_excel(r'jordan.xlsx')
      uzbekistan = pd.read_excel(r'uzbekistan.xlsx')
      pakistan = pd.read_excel(r'pakistan.xlsx')
      madagascar = pd.read_excel(r'madagascar.xlsx')
      china = pd.read_excel(r'china.xlsx')
```

```
[ ]: from geopy.extra.rate_limiter import RateLimiter
     geocode = RateLimiter(geolocator.geocode, min_delay_seconds=1)
     df['locations'] = df['localities'].apply(geocode)

     df['geo'] = df['locations'].apply(lambda loc: tuple(loc.point) if loc else None)
```

Figure 1. Python function used

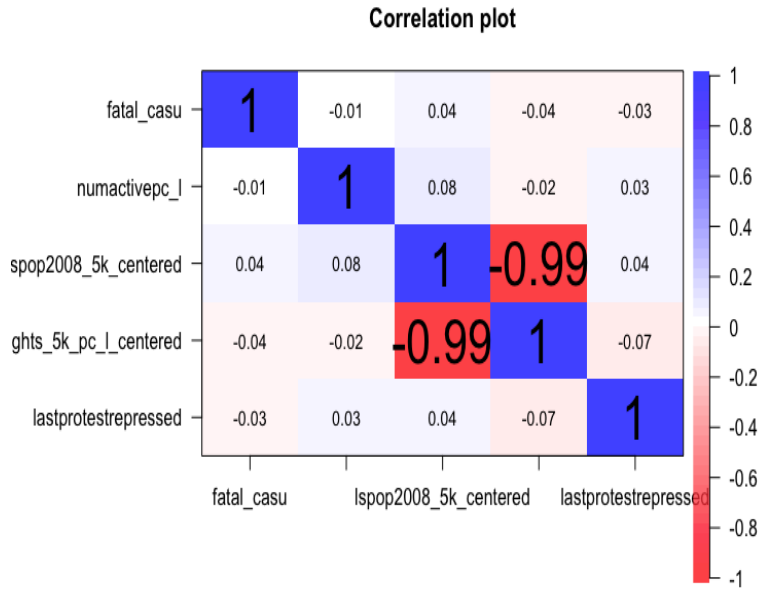

Figure 2. Correlation plot

Appendix B

Table 3. *Ordinary Least Squares model*

	Dependent variable:				
	Disorganised violence				
	(1)	(2)	(3)	(4)	(5)
Internet penetration	0.009	−0.011	−0.006	−0.010	−0.003
	(0.082)	(0.084)	(0.130)	(0.084)	(0.129)
Population density		0.122	0.114		
		(0.109)	(0.112)		
Night time lights				−0.142	−0.153
				(0.144)	(0.145)
Capital city			−0.095	−0.109	−0.099
			(0.157)	(0.155)	(0.156)
Last protest repressed			−0.131		−0.136
			(0.165)		(0.165)
Internet* repressed			−0.013		−0.011
			(0.168)		(0.168)
Constant	0.086	−0.022	0.088	0.046	0.107
	(0.082)	(0.127)	(0.166)	(0.134)	(0.154)
Observations	917	917	917	917	917
R^2	0.00001	0.001	0.003	0.002	0.003
Adjusted R^2	-0.001	-0.001	-0.003	-0.001	-0.003
Residual Std. Error	2.175 (df = 915)	2.174 (df = 914)	2.176 (df = 911)	2.175 (df = 913)	2.176 (df = 911)
F Statistic	0.011 (df = 1; 915)	0.623 (df = 2; 914)	0.519 (df = 5; 911)	0.571 (df = 3; 913)	0.534 (df = 5; 911)
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 4. *Zero inflated negative poisson regression*

	Dependent variable:				
	Disorganised violence				
	(1)	(2)	(3)	(4)	(5)
Internet penetration	−0.470**	−0.717***	−0.777***	−1.592***	−1.081***
	(0.211)	(0.190)	(0.197)	(0.400)	(0.258)
Population density		−1.390***		−7.063***	
		(0.427)		(2.526)	
Night time lights			1.728***		3.189**
			(0.569)		(1.331)
Capital city		−4.132	−4.441	−3.766***	−3.839***
		(2.973)	(3.388)	(1.404)	(1.288)
Last protest repressed				−7.089***	−5.259***
				(1.782)	(1.797)
Internet* repressed				14.276***	7.517***
				(4.273)	(2.519)
Constant	2.522***	5.063***	4.741***	13.927***	6.570***
	(0.154)	(0.690)	(0.637)	(3.823)	(1.396)
Observations	917	917	917	917	917
Log Likelihood	-169.618	-146.366	-147.320	-129.859	-132.415
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 5. *Negative binomial*

	Dependent variable:				
	Disorganised violence				
	(1)	(2)	(3)	(4)	(5)
Internet penetration	1.520**	−0.098	0.120	0.062	0.265
	(0.716)	(0.628)	(0.623)	(0.905)	(0.890)
Population density		4.811***		4.951***	
		(1.069)		(1.288)	
Night time lights			−6.403***		−6.575***
			(1.414)		(1.709)
Capital city		−3.294*	−3.249*	−3.412	−3.349*
		(1.813)	(1.716)	(2.133)	(2.024)
Last protest repressed				−2.688	−2.639
				(2.142)	(2.104)
Internet* repressed				−1.072	−1.065
				(3.159)	(3.011)
Constant	−3.154***	−8.555***	−7.928***	−8.232***	−7.554***
	(0.723)	(1.730)	(1.583)	(2.059)	(1.891)
Observations	917	917	917	917	917
Log Likelihood	-72.486	-66.169	-66.061	-64.001	-63.909
θ	0.003***(0.001)	0.006***(0.002)	0.006***(0.002)	0.006**(0.002)	0.006**(0.002)
Akaike Inf. Crit.	148.971	140.338	140.121	140.002	139.818
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 6. *Poisson*

	Dependent variable:				
	Disorganised violence				
	(1)	(2)	(3)	(4)	(5)
Internet penetration	0.088	0.009	−0.040	0.016	−0.020
	(0.114)	(0.143)	(0.141)	(0.168)	(0.167)
Population density		−1.502***		−1.671***	
		(0.224)		(0.231)	
Night time lights			1.065***		1.235***
			(0.165)		(0.170)
Capital city		−3.450***	−3.389***		
		(1.007)	(1.008)		
Last protest repressed				−1.900***	−1.878***
				(0.377)	(0.377)
Internet* repressed				0.163	0.144
				(0.337)	(0.336)
Constant	−2.447***	−3.302***	−3.376***	−3.210***	−3.365***
	(0.126)	(0.276)	(0.291)	(0.287)	(0.303)
Observations	917	917	917	917	917
Log Likelihood	-507.251	-454.038	-456.256	-451.128	-452.092
Akaike Inf. Crit.	1,018.502	916.076	920.511	912.256	914.185
Note:					*p<0.1; **p<0.05; ***p<0.01

Table 7. *Zero inflated poisson regression, logit*

	Dependent variable:				
	Disorganised violence				
	(1)	(2)	(3)	(4)	(5)
Internet penetration	−0.343	−0.426	−0.435	−0.557	−0.666*
	(0.280)	(0.344)	(0.347)	(0.388)	(0.395)
Population density		−1.665**	−1.680**	−3.288*	
		(0.650)	(0.655)	(1.963)	
Night time lights					2.244***
					(0.861)
Capital city		−0.591	−0.925	−0.209	−0.377
		(2.578)	(3.091)	(1.421)	(1.457)
Last protest repressed				−0.350	−0.576
				(1.600)	(1.338)
Internet* repressed				2.817	1.435
				(3.097)	(1.539)
Constant	4.816***	6.989***	7.022***	8.177***	6.528***
	(0.402)	(1.308)	(1.322)	(2.461)	(1.241)
Observations	917	917	917	917	917
Log Likelihood	-169.618	-146.366	-147.320	-129.859	-132.415
Note:					*p<0.1; **p<0.05; ***p<0.01

	Dependent variable:			
	Disorganised violence			
	(1)	(2)	(3)	(4)
Internet penetration	−12.246	−44.168	−6.674	−18.467
	(11.723)	(84.080)	(4.141)	(45.288)
Population density		128.142		122.598
		(214.598)		(360.172)
Night time lights			−38.348	
			(28.389)	
Capital city		−10.132	−4.479	−7.767
		(21.691)	(4.611)	(25.123)
Last protest repressed			−20.736	−37.661
			(14.692)	(141.906)
Internet* repressed			62.487	106.068
			(44.843)	(367.498)
Constant	3.533**	134.908	59.733	125.427
	(1.760)	(228.861)	(42.406)	(366.808)
Observations	917	917	917	917
Log Likelihood	-66.726	-58.164	-51.263	-51.345
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 8. *Zero inflated negative binomial, logit*

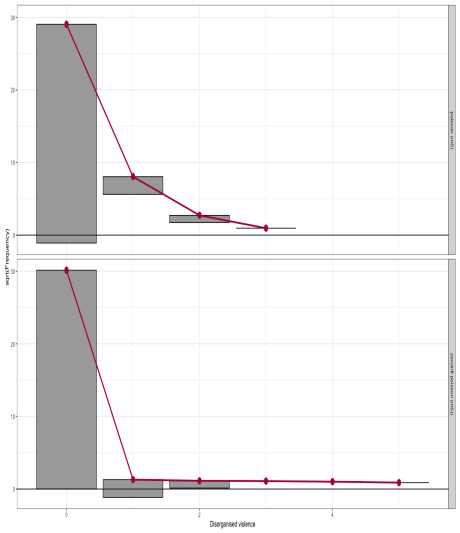

Figure 3. Rootogram for poisson models 4 and 4

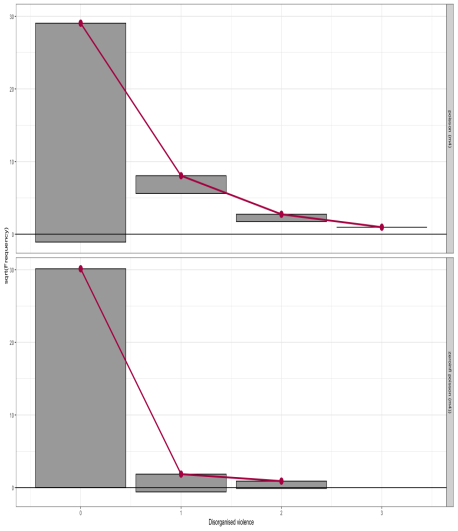

Figure 4. Rootogram for poisson models 5 and 5

	#Df	LogLik	Df	Chisq	Pr(>Chisq)
1	7	-62.91			
2	5	-452.09	-2	778.37	< 2.2e-16 ***

Table 9. *Likelihood ratio test*