The relationship between influential actors' language and violence: A Kenyan case study using artificial intelligence

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Abstract

Scholarly work addressing the drivers of violent conflict predominantly focus on macro-level factors, often surrounding social group-specific grievances relating to access to power, justice, security, services, land, and resources. Recent work identifies these factors of risk and their heightened risk during shocks, such as a natural disaster or significant economic adjustment. What we know little about is the role played by influential actors in mobilising people towards or away from violence during such episodes.

We hypothesise that influential actors' language indicates their intent towards or away from violence. Much work has been done to identify what constitutes hostile vernacular in political systems prone to violence, however, it has not considered the language of specific influential actors. Our methodology targeting this knowledge gap employs a suite of third party software tools to collect and analyse 6,100 Kenyan social media (Twitter) utterances from January 2012 to December 2017.

This software reads and understands words' meaning in multiple languages to allocate sentiment scores using a technology called Natural Language Processing (NLP). The proprietary NLP software, which incorporates the latest artificial intelligence advances, including deep learning, transforms unstructured textual data (i.e. a tweet or blog post) into structured data (i.e. a number) to gauge the authors' changing emotional tone over time.

Our model predicts both increases and decreases in average fatalities 50 to 150 days in advance, with overall accuracy approaching 85%. This finding suggests a role for influential actors in determining increases or decreases in violence and the method's potential for advancing understandings of violence and language. Further, the findings demonstrate the utility of local political and sociological theoretical knowledge for calibrating algorithmic analysis. This approach may enable identification of specific speech configurations associated with an increased or decreased risk of violence. We propose further exploration of this methodology.

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Evidence base and discussion of models/results

Objective

The use of big data, including online language data, is a rapidly emerging field of social science research, predominantly relating to consumer (Dai et al., 2011) and voter behaviour (Ceron et al., 2017). Increasingly, online public commentary has been employed to explain the risk of conflict onset (Chadefaux, 2014). It has been shown that using software to automatically analyse newspaper texts can be an effective tool to predict armed conflict (Mueller and Rauh, 2017), though miscalculations can easily occur (Corley et al., 2012).

In this connection, much work has been employed to identify what constitutes hate speech and vernacular of hostility (Somerville, 2011). However, identification of specific leaders' language associated with conflict onset has not been systematically explored. Though an examination of the language used in the Kenyan Hansard (the Kenyan Parliament) tested commitment to an agreement (Peter et al., 2016), not to violence, the impact of leaders' language over a significant period has not been explored.

A gap therefore exists in the evidence-base regarding the role of leaders' language in shaping group-specific perceptions of group-specific exclusion, or, of the intent of leaders to mobilise grievances to violence. Much work has been done to test the relationship between a number of variables and conflict onset or recurrence. The United Nations (UN) and the World Bank, in their joint flagship study on conflict prevention, suggest perceptions of these variables may be just as, if not more, important than their objective existence (United Nations and the World Bank, 2018).

Development actors have not seriously considered the role of influential actors in shaping perceptions - in mobilising people towards or away from violence. Instead they note that, "whether based on facts or perceptions, groups who feel excluded, relatively disadvantaged, or left out are much more likely to consider violence to be an acceptable response than those who do not" (United Nations and the World Bank, 2018: 7). The report identifies other factors, including "external support, proliferation of weapons, and absence of

deterrents" (Ibid.). It also notes that "actors are constantly faced with choices, weighing responses to a variety of pressures and changes" (Ibid., 8). While there is acknowledgment of the role of actors and their common accountability to short-term incentives rather than long-term prevention, little is said about how they mobilise people and grievances towards or away from violence.

Similarly, the study by the British Government's Commission on State Fragility, Growth and Development on "Escaping the Fragility Trap" defines fragility as "a syndrome of reinforcing characteristics that entrap the society" (Commission on State Fragility, Growth and Development 2018, 9). The fifth step out of the Fragility Trap cited in the report is a power-sharing and decentralised democracy that engenders harmony and inclusive governance (Ibid., 17-18). For this process to be successful, citizens should "come to feel some degree of overarching shared identity and recognise the scope for mutual gains from cooperation" (Ibid., 17). A knowledge gap exists regarding the role played by a society's influential actors in shaping public discourse or sentiment towards or away from shared identity and preference for cooperation. That is, expressions towards inclusion or towards the group-specific grievances associated with increased risk of violence.

We hypothesise that the scarcity of an evidence base for the relationship between leaders' intent or language and the onset of violence is precisely because methods of sufficient integrity have not yet been identified for objectively discerning subjectively employed and interpreted language.

Little scientific evidence exists about the relationship between leaders' language and violent conflict precisely because accounting for context is so critical to interpreting language. The potential utility of new technologies in measuring variance in leaders' online language to identify its relationship to violence is significant. The United Nations and World Bank study acknowledges that the triggers of violence are difficult to determine. However, it does cite exogenous shocks, such as commodity price change or natural disasters, as potentially interacting with social group-specific grievances to trigger violence. Whether such interactions cause violence or not may be informed by multiple other variables, including the intent of influential actors.This study seeks to take some first steps to fill the evidence gap surrounding the agency of leaders in affecting the incidence (or not) of violence. The study seeks to identify the specific forms of language social, economic, security, media, and influential actors use that is associated with the onset of violent conflict. To this end, an application ("app") is created that connects variations in sentiment in influential actors' language to an objective measure of political violence – daily fatalities as reported via the Armed Conflict Location and Event Data Project (or ACLED, also used in a study by Bi et al. (2016) to chart conflict trends in Nigeria).

The Uppsala Conflict Database Project (UCDP) codes the existence of violent conflict between a state and non-state group upon the observation of 25 or more conflict-related deaths per year. (Högbladh, 2004). UCDP data has been cited as significantly under-representing non-state conflict-related fatalities because of the difficulty of identifying the perpetrators of violence (Kishi, 2017). ACLED does not code conflicts as full campaigns of violence. Instead, ACLED employs an atomic format that codes only single days of conflict at a time while still adopting a dyadic format, coding two sides as being in combat with one another (Raleigh and Dowd, 2015). For the purposes of this project, ACLED's

more granular daily specificity of data relating to violence beyond its scale, including its nature, was of most significant utility for this project.

The app uses artificial intelligence (AI) software to parse through changing language configurations of identified leaders in multiple situations/time frames, and automatically assess violent conflict onset risk. The hypothesis is that by using knowledge of local politics and sociological theory to calibrate algorithmic analysis it is possible to identify specific speech configurations associated with an increased likelihood of violence.

This represents a departure from current practice for two reasons. First, while a number of studies identify patterns in online dialogue and violence, they often determine themselves what constitutes violence. See, as an example, Matsumoto and Hwang (2012) where the authors subjectively determine an act of aggression by using the following criteria: "(a) The act was motivated by ideological motives, including racial and political; (b) the act of aggression was not an immediate response to an act of aggression by the other party, such as a surprise attack or immediate retaliation; and (c) the act of aggression was a violent action against a defined out-group, with the intent of causing physical harm, reduced quality of life, and/or denial of basic human rights" (335-348). There is enormous discretion in interpreting events that meet the above criteria, which opens the door to conscious or subconscious confirmation bias. The approach presented in this study is much more rigorous and less vulnerable to bias, because the violence variable is externally produced, as noted above.

Second, this approach distinguishes itself from other conflict predicting systems by focusing primarily on the risk of violence associated with influential actors' language. Previous approaches, as noted above, have focused largely on grievances relating to exclusion of social groups from access to political power, land and natural resources, justice and security, and services, as well as external shocks (for example, rapid increases in food or fuel prices) (United Nations and the World Bank, 2018). Little is known about the role of influential individuals in mobilising people toward violent or non-violent responses when shocks interact with grievances.

Accounting for the agency of influential actors in the onset of violence advances knowledge about the circumstances associated with violent conflict onset. It is therefore necessary to identify language that has an association with actual violence. This task is approached by collecting 6100 Twitter speech instances by 30 influential actors in Kenya from January 2012 to December 2017, and then using AI to test for the language configurations most associated with violent conflict onset.

In this way the study determines if influential actor language is associated with a change in the risk of conflict onset, providing evidence as to whether language may accompany other quantitative and qualitative risk analysis tools – for example those reviewed by the Political Instability Task Force (PITF) and the Good Judgement Project (GJP) – to better identify the risk of violent conflict onset. A further contribution is that by identifying indications of intent in language, this approach may indicate early stages of discourse transition towards increased risk of violence. The end objective is to contribute to the development of an enhanced capacity to predict risk of conflict, by identifying indicators of intent to mobilise people to violence.

Methodology

This study analyses the relationship between language and political violence in Kenya. This particular country case study is selected because other studies have found that rhetoric from Kenyan media can in fact increase or incite ethnic tensions and violence. This has especially been found during periods of social and political instability, such as during and after presidential elections (Somerville, 2011), where the media were even found to be condoning violence in some cases (Cheeseman et al., 2018).

Electoral violence has become a prevalent form of political conflict in recent years (Malik, 2017). Electoral violence-related conflict occurs as a result of incumbents or challengers manipulating election processes to obtain an advantage over their opponent. Although Malik found that elections decrease the risk of violence in the year they are held, the risk of conflict occurring in the year following elections more than doubles. Therefore, elections don't reduce or increase the probability of conflict, instead they merely shift conflict to non-election years.

Malik used two event data sets – the Armed Conflict Location and Event Data Project (ACLED, the same one used in this study) and the Social Conflict in Africa Database (SCAD) – to examine trends in electoral violence across the Global South, and found that younger, lower income democracies experience higher levels of electoral violence, as do countries with presidential systems, and countries with some degree of regional governance. These parameters describe Kenya quite well, making it a good case study for research on political violence.

The methodology partly relies on a suite of third party software tools to collect and analyse 6,100 Kenyan social media (Twitter) utterances from January 2012 to December 2017. The tweets are collected using proprietary threat intelligence software accommodating several themes, including geopolitical risk criteria. This software (of which the proprietors have asked to remain anonymous) also reads and understands the meaning of words in multiple languages to allocate sentiment scores. It allocates sentiment scores using a technology called Natural Language Processing (NLP). The proprietary NLP software incorporates the latest advances in artificial intelligence, including deep learning, to transform unstructured textual data (i.e. a tweet or blog post) into structured data (including numeric scores) to gauge the changing emotional tone of authors over time. The sentiment scores used in this study are positive, negative, and violence. Each metric, computed using a bag-of-words model, has a word list associated to it, so that sentiment scores are determined by the frequency and intensity of specific words used in a piece of extracted text (Taspinar, 2016).

This technology is not flawless. First, it cannot always collect and process all targeted reporting available on the net and consistently filter out incorrect or biased data (see Gundberg and Timle, 2012); and second, though few, false positives cannot be entirely avoided. An author may have negative sentiment but write politely, using neutral or even positive words; or, an author might use words that indicate strong negative sentiment sometimes, but not in all contexts. For this reason, the most reliable way to use sentiment scores is across many data points.

This technology is often used in studies of language on social media platforms such as Twitter. Twitter Sentiment Analysis (TSA) uses NLP to identify

and obtain information regarding consumer or political trends through tweets. Researchers are better able to classify and understand emotional reactions to various types of language and/or political events in this way (Bravo-Marquez et al., 2014). Indeed, language in online communication is often quite emotional. Social media facilitates information sharing and the ability for people to communicate during times of crisis and political instability when emotions are very often running high (Ramadan, 2017; Zeitzoff, 2017), and have also been found to be an effective method to avoid censorship (Abdelsalam, 2015), or for enjoying anonymity, thus allowing for a wider range of expression. Furthermore, it enables, according to a Rand Corporation congressional testimony, "manipulation of our perception of the world … on previously unimaginable scales of time, space and intentionality" (Waltzman, 2017: 1).

An example of a TSA study, also by the Rand Corporation (Bodine-Baron et al., 2016), examines the language of potential extremist actors on Twitter, and considers: (1) How can we differentiate ISIS supporters and opponents on Twitter? (2) Who are they, and what are they saying? and (3) How are they connected, and who is important? They used a ten month sample of Twitter users and found that supporters and opponents are differentiated based on the name used to refer to ISIS ("Daesh" or "Islamic State"), and that "ISIS opponents outnumber supporters nearly ten to one." However, "ISIS supporters routinely out-tweet opponents, as they produce 50% more tweets per day." They further distilled Twitter users into "36 distinct communities and ultimately into four major meta-communities" and used language analysis to characterise their identities and prominent themes. They find, for example, that greater division exists among Sunni and particularly Gulf Cooperation Council communities, than among Shia or ISIS-supporting communities (xi).

These approaches fall under the category known as Open Source Intelligence (OSINT), or a means of gathering intelligence from data collected from sources available to the public. It is becoming more frequently used by intelligence analysts (Johansson et al., 2011), since information that is extracted can be used to detect emergent trends, such as those that can predict upcoming conflict. Gathering such large amounts of data (from web pages and web feeds) is nearly impossible to do by human intelligence (HUMINT) alone, or manually. Tools that have been created primarily in response to commercial need are increasingly also of utility in considering conflict risk.

The main challenge here is not having access to enough information, but being able to make sense and use of it (Truvé, 2011). An example of extracting useful information can be seen in a study by Kallus (2014), who looked at social media's impact on predicting major protest events in the Middle East. He used software to gather data from over 300,000 open content web sources in seven languages and organised them by time-stamp. He then compared the time-stamps with the dates of major occurrences. For example, if a post mentioned the future date 22 August, Kallus then time-stamped that post with that date and sought out a correlation between it and a significant political or social event in the future. He found that it is possible to predict mass protests due to an increase in online mentions of a particular future date.

Four days prior to a 9 June Beirut protest against Hezbollah, for example, there was discussion on Twitter calling for people to protest on that date. In the case of the 2013 Egyptian coup d'état that began on 3 July, evidence of

a mass protest in the works went as far back as 6 June. Discussion on social media expressing distaste for Egypt's then-President Mohamed Morsi and reports about rising tensions preceded the onset of protest, demonstrating how automated analysis of online discourse can predict major events.

These types of automated text analyses work best when combined with a critical discourse analysis of individual text samples. The following study by Coesemans et al., also on Kenya, is a good example of this. The authors investigated the benefits of combining text mining – described as "constructing classification models and finding interesting patterns in large text collections" – with discourse analysis. The research was conducted through a case study comparing media discourse between "local (Kenyan) and Western (British and United States/US) newspapers" during and after the 2007 Kenyan elections (Coesemans et al., 2011: 647). Methodologically, the goal of the study was to examine the application of text mining to support discourse analysis. The thematic aim of the study sought to reveal differences between lexical choices applied by local and Western newspapers that can be explained through ideology.

The selected data included 464 Western and local news articles starting 22 December 2007 and ending 29 February 2008. Half of the articles were collected from four Western newspapers including *The New York Times, The Washington Post, The Times*, and *The Independent*. The other half were taken from two Kenyan local dailies; *The Standard* and *Daily Nation*. The study was built around the hypothesis "that a comparison of different newspaper articles will show a discrepancy between local (Kenyan) and international ('Western') news coverage" (Ibid., 648).

The methodological framework, as mentioned, included a combination of text mining and discourse analysis. Text mining allowed the discovery of contrasts between local and Western press coverage. The interpretative methodology of discourse analysis allowed the results from the text mining to be evaluated and interpreted from a social and cultural perspective. The study followed a four steps process; "selection of a corpus, document pre-processing, text mining, and finally the interpretation and human evaluation of the automatically discovered models and patterns" (Ibid.).

The Coesemans et al. study found that the local press described the major political parties (Party of National Unity and Orange Democratic Movement) by their acronyms "PNU" and "ODM." They did not reference ethnicity and had a strikingly high use of the words "mediation" and "talks." Western media on the other hand, used words such as "opposition" to describe political parties. They also referred to political parties by their associated tribe and expressed other ideologically loaded words such as "tribalism." According to the authors: "Our experiments indicate that most significant differences pertain to the interpretive frame of the news events: whereas the newspapers from the UK and the US focus on ethnicity in their coverage, the Kenyan press concentrates on sociopolitical aspects" (Ibid., 647).

Methodologically, Coesemans et al. acknowledge that their results would not have been as strong if they had only relied on either text mining or discourse analysis. For example: "Quantitatively the topic of violence is more or less equally covered, but a qualitative pragmatic analysis combined with text mining reveals that the Western press often puts instances of violence into a tribal

frame, either explicitly labelling violence as tribal and ethnic, or linking it to the ethnicity of the perpetrators. In the local press the violence is connected either to political protest or to criminal behaviour without any explicit references to the ethnicity of the people involved" (Ibid., 672).

For the purpose of this project, the main takeaway from Coesemans et al.'s research is that for automated text analysis to be methodologically effective it must be accompanied by a more qualitative layer. This layer in our study is represented by the process through which influential political, military, and civil society actors are selected to be included in our data collection phase. In other words: Whose language are we interested in monitoring and correlating with increased risk of conflict?

To this end we have adopted a qualitative methodology, interacting with academic and policy experts on Kenya, located both locally and internationally, to create a short list of 30 key actors. These have been selected according to their perceived potential for contributing to political developments in the nation, including their influence over large groups of people. We consulted twenty-four Kenya experts (most of whom prefer to remain anonymous), including academics (historians and political scientists), policy commentators (from both the media and policy organisations), and policy practitioners (from government). We selected the 30 persons that were most commonly identified by the experts as the most influential actors in Kenya.

Daily sentiment scores connected to Twitter utterances are collated by our specifically designed app, called "Ethnographic Edge," via an API and organised into two data sets: A training data set (4300 tweets from January 2012 to December 2015) and a test data set (1800 tweets from January 2016 to December 2017). The test data set contains exactly the same type of data as the training data set, except for occurring chronologically later. Both data sets are overlaid with the dependant variable we have selected to act a as a measure of political violence – the daily number of political violence fatalities as reported by ACLED – in addition to other independent variables extracted from the same source (including daily number of riots/protests, acts of violence against civilians, incidences of remote violence, and strategic military developments). Next, the training data is processed by AI software housed on our app to find a model that best identifies patterns. Once a model is found, it is applied to the test data set and measured for predictive capacity. AI models and results are discussed in the 'Findings' section below.

Limitations

Perry (2013) finds that the increased use of big data surrounding conflict will prove to be useful in creating early warning systems and will ultimately help international organisations and non-governmental organisations to mitigate the consequences of conflict and develop means of prevention. By testing a machine learning algorithm of his design, Perry was able to successfully predict outbreaks of conflict in Africa. The algorithm tended to over-predict conflict but was overall highly accurate. When using larger and more varied samples of data there was an increase in accuracy and specific locations could be pinpointed. The results of Perry's experiment show that technology can play a major role in

conflict prediction, and that by incorporating more qualitative data – although hard to compute – one can achieve fairly high rates of accuracy. However, he notes that the high costs of state-of-the-art statistical forecasting models limit organisations to more rudimentary systems, resulting in less reliable intelligence.

There are a host of other limitations. Despite the techniques and software programs developed in recent times, textual analysis cannot be used as a silver bullet to predict political trends, as "real-world outcomes can change in ways that are not anticipated by data-based models" (Schoen et al., 2013: 529). Also, there are a number of caveats unique to this study. This includes the methodological difficulty to allow for changes in media type over the past seven years, how comprehensive the data sources are, the inability to account for the relationship between the language used in social media and that used in the small group meetings that are so important in Kenyan politics, the place of the vernacular, and the inability of the software to deal with dog-whistle language. Questions also surround the definition of "influential" actors, as the list mostly includes politicians with a national profile in terms of office and ambition but omits many local actors that may be key in mobilising to violence, or perhaps even working as proxies for national actors that prefer not to expose themselves via compromising language. This pilot study is, of course, designed to help us think more about these limitations.

A further risk is that influential actors may choose to not make utterances online, and therefore the intent captured in the language of observed actors is not representative. It is important to clarify that our methodology engages qualitatively with leading historians, political scientists, and security sector collaborators to identify the most influential persons without regard to their online utterances profile (i.e. number of tweets). While this may mean that for some actors, little can be gleaned from their sparse online utterances, it prioritises the methodological integrity of the project.

To mitigate the risk of being perceived to draw conclusions concerning causation, it is necessary to clarify that the approach put forth in this study is focused on testing for association (not causation) and to acknowledge that multiple factors contribute to violence. Nevertheless, by identifying connections between past language and violence, it will be credible that present-time language can indicate increased risk of – not the absolute prediction of – violent conflict onset in the future.

Regarding risk of confirmation bias, this is dealt with methodologically by dividing the data into two sets; one upon which the model "trains" itself, and one in which it "tests" itself, as explained above. In the first data set the model will parse through different language configurations and their association with violence. In the second it will test its ability to use identified patterns to accurately predict the onset of violence. The second data set contains exactly the same type of information but for a different (immediately later) time frame. There is no scope for the authors of the study to select a second data set that has better potential to confirm the research hypothesis.

Finally, the use of AI and "big data" itself, of course, raises concerns to be cognizant of, for example surrounding prejudice, bias, and brittleness (Athey and Imbens 2017, Ioannidis 2005, Domingos 2015). There is a very present awareness among the AI academic community of the technology's power to do harm (see Part II, section 2 below). Models make predictions by extrapolating from patterns
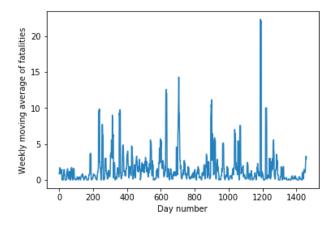
found in data on which they are trained. Yet, there may be considerable bias concerning the collection and presentation of data to the algorithms, or the way classification categories are decided. This bias may be present in the social and cultural environment of the researchers and may unconsciously drive the very decision to collect certain data or to classify it according to certain standards. Also, given the involvement of supposedly "dispassionate" technology, AI predictions gain the kudos of being "evidence-based." This makes the bias that may be there even more opaque and harder to see. Finally, since so much of machine learning occurs autonomously, the technology can remove meaningful human control from important intermediate steps that determine outcomes.

A further limitation is that modern NLP and AI methods are not well tuned for minor languages. Recent successful language understanding techniques do not extend to indigenous languages with little data. Major languages, like English, benefit from a large corpus of digital language – i.e. Twitter and the Web. The very successful NLP techniques being used today extract meaning from words by uncovering their frequent association with nearby words. However, for indigenous and even creole languages the same volume does not exist, making it difficult for machines to understand the many nuances of language. This is not to say that in common languages NLP technology is flawless. First, it cannot consistently filter out incorrect or biased data; and second, though few, false positives cannot be entirely avoided. Sarcasm and colloquialisms, for example, can create false positives. For this reason, as mentioned, the most reliable way to use sentiment scores is across many data points; which this study does.

Findings

We divided the collected social media data into two sets, one for training and one for testing our model, using Random Forest techniques. The data collected from the years 2012-2015 are used for the training of the model and the data from 2016-2017 are used to test the trained model. Random Forest classifiers are state of the art methods for robust classification tasks. Unlike Deep Learning models, which are known to be data hungry, Random Forest models require a moderate amount of data and almost no parameter tuning.

The historical data for training contains data for 1460 days, where each day contains information about the sentiments of tweets from 30 different key influential persons in Kenya, in addition to the contextual ACLED data described above. We also have similar data for testing; this data belongs to a different time frame and captures 730 days. In this section, we shortly describe how the first set of data can be used to create a model that can predict relative levels of violence in the second set. The variable we are attempting to predict is the level of average fatalities due to political violence in Kenya. See Figure 1 for one way to visualise this variable.
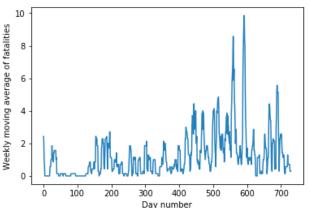
Figure 1: Change in weekly moving average of fatalities in Kenya for the periods 2012-2015 (left) and 2016-2017 (right).

For this purpose, we feed our model sentiment information associated with influential actors' language for the last 30 days. We predict if the average fatalities of the timeframe within the next N days will be higher or lower/in-range relative to the overall average fatalities of the entire data set. Higher is 25% higher than overall average, otherwise it is considered lower/in-range. N is a variable that refers to the 'look ahead' period of our predictions. For instance, if the look ahead period is 60 days, the sentiment data belonging to the last 30 days will be used to predict if the average fatalities in the next 60 days will be higher or lower/in-range relative to the overall average.

Based on this scenario, first, we create a training dataset using the data from 2012-2015, where each sample contains sentiment data from different 30 day periods and a label that indicates if the average fatalities in the next 60 days, which is the look ahead period, will be up or down/in-range relative to the overall average (for shorthand, increase or decrease). This training set is fed into the Random Forest classifier model to learn the correlations between the sentiment data and the increase or decrease in the fatalities for the given 60 day look ahead period. Once the model is trained using this data, we test it on the test set, which is created using the same technique but with data from 2016-2017.

We perform experiments using different look ahead time frames in order to explore variations in the model's performance. Each experiment is repeated ten times to measure the confidence of the results. Figure 2 demonstrates the performance of the model, measured as the accuracy percentage, on the test set for different look ahead days with error bars representing the standard deviation. Predictive accuracy nears 85% when the look ahead period is between 100 and 125 days.

To evaluate the performance, we use the ROC Area Under Curve (AUC) metric, which is used to confidently measure success of machine learning models. It is especially useful for imbalanced datasets, where data for one category (i.e. increase in average fatality) is significantly smaller than data for the other category (i.e. decrease in average fatality). ROC AUC becomes 0.5 as the model makes random or uninformative predictions and it nears 1.0 as it makes correct predictions.
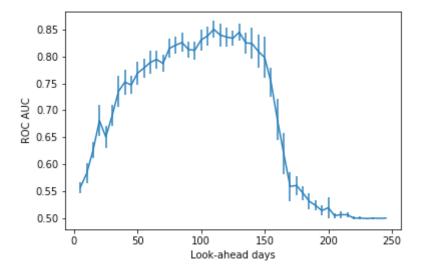
Figure 2: Performance of the model for the test set at different look ahead days.

In order to better interpret Figure 2, in Figure 3 we show the prediction accuracy separately for the categories representing an increase and decrease in the average fatalities (at left). The figure also shows the number of samples for each category (at right).

Figure 3: Prediction accuracy for each category (at left) and the number of samples (at right) for the test set.

These figures indicate that our model can most reliably predict both increases and decreases in average fatalities for look ahead periods between 50 and 150 days, with overall accuracy approaching 85%. For longer look ahead periods, the success rate decreases dramatically. Interestingly, for much shorter look ahead periods (i.e. five or ten days), the predictions are also very inaccurate. This may be explained intuitively by suggesting that the effects of influencer language on violence may appear with a delay.

Also, Figure 2 shows that when the model cannot learn the correlations necessary to make confident predictions, it chooses to predict the majority category exclusively. We find that the model almost always chooses to predict a decrease in average fatalities for very small look ahead periods and an increase in fatalities for very high look ahead periods. For these marginal cases, the

model's predictions are not useful, and are considered uninformative according to our ROC AUC metric.

We hypothesise that these results can be improved further with larger training data and further testing of various machine learning models, including deep neural networks. With additional resources we may also begin an exploration of the relative influence of individual lines of input (i.e. individual actor sentiment type and/or individual lines of ACLED contextual data) on the overall capacity of the model to predict risk of violence correctly. Moreover, given the time and resources we would like to further explore language and sentiment fluctuation in additional types of online media, including mainstream news. For this pilot project, sentiment data about key influential Kenyan actors was also collected for the same time frames, but limited resources did not allow sufficient exploration of its impact on the capacity to predict violence. Nevertheless, with existing resources and available data, this preliminary analysis indicates a statistically significant correlation between language and future political violence, providing ample proof of concept to warrant further investigation of the topic.

Photo: Getty | Petr Kiama/EyeEm

Literature review

2

Big data, AI, and risk of conflict onset

Online and offline political participation

The Internet has become a significant factor in shaping political dialogue by providing a platform for citizens to voice their concerns and criticisms (Rodgers, 2003; Jenkins, 2011; Zhou et al., 2011; Dalton, 2006), while assisting political actors to coordinate action (Ayres, 1999; 2003; van Aelst and Walgrave, 2002). Observers have noted that online communication has resulted in increased citizen participation (McCaughey and Ayers, 2003) and scope for action (Flanagin et al., 2006; Castells, 2009; van Laer and van Aelst, 2010; Lievrouw, 2011). It has also been observed that online communication can be prefigurative of offline expressions of discontent (Diani, 2000; Pickerill, 2003; Della Porta et al., 2006).

Socialisation in general has been long recognised as one way in which individuals not associated with political movements may develop similar mentalities and social relations that lead them to involvement in high-risk protests (McAdam, 1986). Observers cite online socialisation, in particular, as a powerful channel to recruit for political action (Diani, 2000; Lusoli and Ward, 2003; van Laer, 2010). Online socialisation helps information circulation beyond intended audiences and builds bonds with individuals involved in political organisations (Diani, 2000; Pickerill, 2003). It can also "activate" citizens who have the potential to become politically active but have hitherto not been, by exposing them to new facts, viewpoints, and interpretations (Postmes and Brunsting, 2002).

However, scholars have noted that while it is an efficient method of communicating for political purposes, online socialisation does not replace the importance of personal bonds, which are also necessary for recruitment (Wellman et al., 1996). Online interactions alone do not provide the opportunity to form bonds of trust established in interpersonal communication (Diani, 2000).

The literature considers the question as to what the nature of the relationship between online communication and offline events is. For some, like Margetts et al. (2015) "tiny acts of participation" on online media create "chain reactions" that can lead to significant political change. According to Aouragh (2016), the use of digital media enables political change and can even alter the direction of that change. Jenkins et al. (2016) argues that far from being politically apathetic,

individuals today are successfully and engagingly mixing popular culture with new communication technologies to impact politics – unleashing a new "civic imagination" and political dynamism. Others have found that increasing access to the internet in new locations and among new demographics has fostered increased mobilisation and collective political action (Rodan and Mummery, 2017; Schumann, 2015). Online media, therefore, provides a platform where different voices and stakeholders can come together and participate more forcefully in democratic processes (Ardizzoni, 2016), and where protest movements may be transformed around the world through the rise of the "communication revolution" (Shumow, 2014).

Other observers, like Fenton (2016), urge a more critical approach to the study of online media and offline events, challenging easy parallels sometimes drawn between the rise of online media and contentious politics. Dencik and Leistert (2015) are also critical of the relationship between online media and protest and propose a contextualised picture of the commercial and political objectives of the social media platforms themselves. They suggest that the technology offers not simply new communication tools in citizens' hands but constitutes part of an economic environment – motivated by specific corporate profit objectives. Roberts (2014) doubts whether digitally mediated politics is actually anything new or effective, discussing the extent to which we are "instead being transformed into subjects of online consumption and orderly surveillance."

More needs to be understood about the challenges involved in using the internet to mobilise large numbers of people (Tufekci, 2017). Research is warranted to add to the debate focusing on the nexus between online communications and offline mobilisations. One thing most observers agree on is that the online media revolution has had a significant impact on politics. Baldwin-Philippi (2015) looks at how use of online media has been taken up in political campaigns, and how these technologies have changed the understanding of political participation, creating a need for new norms and new vocabulary for speaking about citizenship. Kreiss (2016), too, notes that electoral campaigns today rely massively on online media and have become "technology intensive" to the point where the party that makes best use of this technology can potentially gain great advantage in the election.

Monshipouri (2017) proposes that new technologies are changing the definition of civic engagement in paradoxical ways. They have, on the one hand, made citizens less associational in person and therefore driven us further from traditional civic life, but on the other have made mobilisation easier to organise, and galvanised populations against their governments. Gainous and Wagner (2013) find that since information is no longer structured by media gatekeepers – as was the case with television and print newspapers – there is now a much freer flow of information, which facilitates mobilisation. Costs of information have been lowered, says Zeitzoff (2017), allowing more people to participate in public discussion, thus changing the dynamics of communication between individuals.

In Asia, for example, the rapid growth of independent online news websites has had a significant impact on electoral politics, challenging media laws and a culture of self-censorship in the mainstream press, driving a sense of digital citizenship (Kent et al., 2017; Seto, 2017; Chinnasamy, 2017). The advent of immediate and participatory online media has given groups such as opposition parties, non-governmental organisations (NGOs), and social movements

enhanced capacity to access and circulate information to the public.

Morris et al. (2016), on the other hand, ask whether these technologies have really revolutionised elections, whether hyperlinked society is truly different from its previous iterations, and whether the Internet increases or decreases democratisation. Their work finds a great diversity of uses and nuances of change. One central question is what kinds of political change are brought about by such transformations in different geographical places? Biswarup (2017) argues that the conceptualisation of state power as uniformly hostile to the free flow of information – as made possible by the Internet – does not always apply to the Global South. Some states, notably India, regard the democratising power of online media positively – as capable of catapulting the nation into an era of modernity and increased equality. Jurriens (2017), conversely, suggests that digital technologies in the region have contributed to increasing inequality; while many have benefited from technology-related changes, many others – the poor, elderly, and otherwise digitally marginalised – have not benefited at all and are perhaps even worse off.

While the technological revolution in the Global South and elsewhere may indeed be unequal and politically unpredictable, it appears, qualitatively, to hold significant potential for social change. Online media's perceived potential also renders it a highly contentious space, used by powerful elites and a mobilised citizenry alike, in attempts to advance their various agendas (Tapsell, 2017). This all begs the question: Can it be used to predict political events?

Assessing risk using online data

By exploring correlations between online communication and offline events, can one also better understand more theoretical questions regarding potential causation? Do increases in particular forms of online utterances by influential individuals repeatedly precede offline conduct including violence? Prior to the start of a political conflict, for example, Chadefaux (2014) notes there is often an increase in the spread of information and news stories surrounding a particular issue of social or political concern. Statistical evidence also revealed that Internet and mobile phone usage caused socio-political disruption and democratic change throughout the 2011 Egyptian revolts (Groshek, 2012).

Of course, causation can go the other way, too, where offline events impact online language. Studies on the content of tweets identified a relationship between major offline occurrences and shifts in a population's online sentiment (D'Avanzo et al., 2017; Gillies and Van Der Vyver, 2017). Another study on negative political discourse on social media platforms concluded that high amounts of traditional campaign advertising with a negative tone leads to higher levels of political engagement by citizens, but also facilitates the onset of online incivility (Hopp and Vargo, 2017).

Similarly, in certain contexts, language in particular publications may signal forthcoming conduct or policy change. This has been demonstrated by (Zhong and Chan, 2018) in their Policy Change Index (PCI). They demonstrate the relationship between text within the People's Daily newspaper, which they cite as the Chinese Communist Party's mouthpiece, and Chinese Communist Party policy change – the PCI. The PCI allows Zhong and Chan to "predicts the timing

of policy changes but also understand the substance of these changes before they are realized" (30). Further, discrepancy in the PCI of regional papers, Zhong and Chan hypothesize, may indicate levels of independence enjoyed by regional authorities (29). They also hypothesize that levels of newspaper or media outlet bias relative to one another might be quantified in an index using a similar approach to theirs. In fact, they cite potential for identifying the role of legislators' language in predicting change in their voting behavior (30) – a method which, similar to ours, uses the language of influential actors (legislators) as the independent variable.

As participation on social media increases, the opportunity for private and public organisations to make more accurate predictions based on collected information also increases (Udanor et al., 2016; Hwong et al., 2017). Sutton et al. (2014) looked at Twitter to predict communication patterns during disaster response. They examined factors influencing serial transmission – the passing on of information from one source to another – and created a model predicting retransmission probability by analysing message style, thematic content, and follower dynamics. Another analysis demonstrates social media's significant capacity to predict electoral results (Ceron et al., 2014). Weinberger (2017) believes that initiatives such as the Open Source Indicators (OSI) project, sponsored by the Intelligence Advanced Research Projects Activity (IARPA), will be critical in providing the intelligence community with predictions on a wide variety of social and political events, including cyber-attacks. The project gathers digital data from social media feeds, but also traffic cameras and television sets.

Yi (2017) says that even as violent conflicts have been occurring more frequently and less predictably (Global Risk Report, 2016), the ability of research institutions to predict conflict has been enhanced due to newly accessible information and communication technology (ICT) tools – such as mobile devices and social media platforms. These new sources make it easier to gather data in real-time. However, Yi also notes there are three challenges that researchers face when using ICT tools and data to predict conflict and use the findings as a basis for policy making. The first is timeframe. It is easier to predict conflicts in the short-term because it is reliant on big data and ICT tools, which acquire data that will remain relevant only for the forthcoming days or weeks. Regarding long-term predictions, much more can happen in the period of time between the present and future political, economic, and social end points, which can affect the projections' accuracy. The second challenge is that it is still unclear as to how beneficial the results that come from forecasting are to policy making. The third issue is that there is a margin of error for prediction models. No matter how modern, advanced, or detailed the tools used for analysis are, it is possible for the findings to be incorrect.

The limits of online language

Despite the possibilities, several academics have acknowledged the limitations of using social media data in predictive research and stress the need for a deeper understanding of this type of data in forecasting events (Schoen et al., 2013; Silfverskiöld et al., 2014; Landwehr et al., 2016; Cederman and Weidmann, 2017). Social media is more accessible in some locations than others, for

example, which may significantly impact the results of a study (Volkova et al., 2017). Furthermore, the actions and intentions of humans differentiate according to culture and context (Duranti 2015).

For this reason, some insist that to understand social media use it is necessary to keep the focus on what occurs offline – where we may learn about the cultural context. Scholars have suggested that there is a co-constitutive relationship between digital and physical worlds (Juris, 2008; Gerbaudo, 2012; Milan, 2013), and that it is becoming more and more difficult to easily delineate boundaries between these two worlds (McCullough, 2005). To look solely at online conversations does not grapple with complex social environments that inform those conversations. Social media usage is localised, in this view, and regulated according to local customs (Horst and Miller, 2012; Miller, 2011; 2016; Miller and Sinanan, 2016). State et al. (2015) found that digital communications are bound by cultural, religious, and ethnic boundaries. This has led to a great number of studies focused on social media use as distinguished by gender, ethnic, or class identity. Anthropologists have immersed themselves in the lives of people using various types of social media – as opposed to earlier studies focused on the virtual worlds themselves (Boellstorff, 2008).

Studies in this vein have looked at, for example, the great migration from offline to online in industrial and rural China (Wang, 2016; McDonald, 2016); the interplay between more conservative public-facing social media identities and actual offline lives in Turkey (Costa, 2016) and Italy (Nicolescu, 2016); and the encapsulation of social media usage in India within local caste practices (Venkatraman, 2016). One major finding in this domain is that political participation on social media looks very different when studied in connection to local social contexts than when studied without such connection (Costa, 2016). It is easy to draw the wrong conclusions when social media is studied only off the screen. Oman-Reagan (2012), in studying the Indonesian version of the Occupy Wall Street movement, found that the local Indonesian online adaptation of the global Occupy discourse interlaces with local histories of colonialism to become very much its own enterprise.

Similarly, scholars in political anthropology examining relationships between new protest movements and increased online media usage find that this use is not only part of a virtual, or cyber reality, as often portrayed, but immersed in physical reality – and part of a re-appropriation of public space (Gerbaudo, 2012). Milan (2013), too, finds that online media use among activists is only part of an ongoing and ever-evolving experiment in contentious political communication that started with radio. There are simply more "channels" available now. Ruiz (2014) observes that this has resulted in a fracturing of the political message, which suggests why it is difficult for mainstream observers to identify coherent political platforms in new movements.

The data science solution

Scholars in anthropology and protest studies address the issue of increasingly blurry lines between the digital and physical by rooting analysis predominantly in the physical world. They have not gone beyond a key tenet of social science developed in the pre-digital era: The researcher is still cognitively interacting with

a given political subject at a particular time. This may no longer be sufficient.

Carty (2012, 2015) points out that levels of co-penetration between online and real-world political participation have reached a point that merits a more radical reconceptualisation of the field. While it is agreed that researchers need to be able to keep the focus on the micro level and on the cultural context to understand online political participation, she prompts the question of how we may actually go about doing that, given that the scale of users has increased so quickly and digital penetration has disrupted those local cultural dynamics so radically that face to face analysis simply does not keep up.

Some social scientists are attempting to solve the problem through engagement with data science. Ackland (2013) argues that social scientists, to better understand online activity, must draw on disciplines like computer science. So much of our lives are now recorded online that the scale of data we can collect has reached unprecedented levels – this cannot be ignored. The need has grown to find new ways to interact with web activity (Cantioch et al., 2014), so much so that data scientists have become, in a fashion, the new demographers (Rudder, 2015).

The benefits of integrating AI (Artificial Intelligence) into the social sciences are numerous (Wang, 2013). The collection and organisation of open source online data now far surpasses human capabilities. It is possible to use automated algorithmic analyses to extract knowledge from online sources (Bi et al., 2016). Yet, the availability of large amounts of data can complicate research (Buchanon, 2017). Consider the great complexity of measuring online chatter: There is much noise, and many false signals in this ocean of data – as for example, those generated by robotic activity that simulates human behaviour.

Another challenge is the influence of powerful actors on the broader online dialogue as a whole (González, 2015a, 2015b; Hansen and Porter, 2017). Everyday conversations, which have to a large degree moved from the physical to the digital world, are now more easily and continually monitored by businesses, governments, and politicians (Moe and Schweidel, 2014). Brooks and Gupta (2013) recognise not only the power that online media has to shape politics, but also the power that political actors (from governments to spy agencies) now have to use online media to realise their own objectives. As countries begin to cooperate multilaterally in the collection and monitoring of data, Slaughter (2011) notes that citizens will have to keep pace with the increased potential for the abuse of power.

A measured and critical approach to the use of AI in social science research, therefore, is warranted (Reed, 2014; Elmer et al., 2015), that engages with a growing tradition in the sociology of AI (Woolgar, 1985; Findler, 1991; Leonard, 1997; Hakken, 1999; Forsythe and Hess, 2001; Smith and Morra, 2006; Whitehead and Wesch, 2012; Richardson, 2015; Guo, 2015). This tradition differs from AI's straightforward application to research objectives in that it seeks to understand cultural and professional presuppositions built into the very AI models that are employed. Forsythe and Hess (2001), for example, sought to find the hidden cultural assumptions in "computerised explanation systems" which, beyond being simply technical tools, are value laden and reflective of reasoning embedded in the knowledge systems of which they are a part. Researchers must therefore reflect critically on the inputs, parameters, and outcomes of AI models.

Using automated algorithmic analysis to research relations between online

text and contentious politics in this way relies not so much on an autonomous statistical capacity, but more on a prosthetic intelligence of the researchers' (Smith and Morra, 2006). This perspective allows us to humanise the technology (Hakken, 1999), bridge the gap between the fields of sociology and machine thinking (Wolgar, 1985), and embrace a view of AI for which the technology – essentially long strings of code – becomes a constitute part of the researchers' psychological self (Turkle, 1984, 1995, 2007). This requires more than simply using the technology alongside traditional research methods (Anderson et al., 2009; Burell, 2012), but using an innovative and self-reflective deployment of AI to significantly expand the scope of the field (Findler, 1991).

Triggers, sources, and dynamics of conflict

Identity as a source of conflict

Scholars, proceeding on assumptions of the rationality of actors in fragile and conflict-affected situations, identify rationalist, material, and structural factors to explain mobilisation to collective violence, including: horizontal inequalities (Stewart, 2008; Muggah, 2014); relative deprivation and long-standing ethnic or religious grievances (Gurr, 1970; Giuliano, 2011); weak state capacity, political instability, poverty, rough terrain, and large rural populations (Fearon and Laitin, 2003); ethnic exclusion from state power (Cederman et al., 2010); the availability of lootable natural resources or illicit markets (Berdal and Malone, 2000; Collier and Hoeffler, 2004; Ross, 2004; Felbab-Brown, 2009); information asymmetries (Fearon, 1995); credible commitment problems (Walter, 1997); ethnic or sectarian security dilemmas (Melander, 2009; Posen, 1993); coercion (Eck, 2014); and selective incentives (Olson, 1965; Popkin, 1979; Berman, 2009).

As can be noted from the above list, persistent inequalities between socio-economic groups can cause social discontent to rise. Increasing grievance, particularly group-specific grievances, can interact with shocks, such as commodity price change or natural disaster, to cumulatively elevate the risk of conflict. Humiliation is one of the most prominent causes for grievances. Khosrokhavar (2017) finds that with new communication technologies and new media outlets, people are more informed and events reach a wider audience than before. These outlets make it harder to hide humiliation now than in the past. Governments are known to also use communication technologies to spread their version of events and suppress alternative accounts.

Khosrokhavar also notes that people react to humiliation in variant ways. Reactions can differ from violent and non-violent protests to total passiveness and apathy. Culture plays an important role in determining the reaction of victims that have suffered humiliation. For example, in some cultures, "specific forms of humiliation cause losing face in a deep damaging manner, in others, the same type of humiliation can be more or less tackled without definitively losing face" (14). In multiple cases (The Rohingya crisis, Arab Spring, Chechnya, Kashmir, and Palestine) social group-specific humiliation, along with the denial of dignity, resulted in major violent protests by groups who felt targeted by societies and

governments. Critical characteristics that can lead to either violent or non-violent protests, Khosrokhavar finds, are a strong sense of identity among members of a group and a lack of economic and social opportunity.

Social identity theory may therefore be helpful in understanding what triggers violence. This theory refers to a person's self-perception based on membership to a group (Kang, 2017). Encompassed in this theory are collective identity and identity competition. "Collective identity" refers to a group's shared sense of belonging, which includes "common language, religion, national or racial origin, shared cultural practices, and attachment to a particular territory" (Gurr, 2000: 1). "Identity competition" refers to the need for one group to be superior over another. While identity plays a key role in conflict, it is important to note that differences in culture do not directly cause disputes, otherwise no regions with co-existing cultures would be peaceful (Cohen, 1974; Fearon and Laitin, 1996). However, violence can easily occur due to identity competition. Violence becomes more likely when a group perceives that it needs to demean another group, especially when they are at risk of losing power or feel unsafe or insecure (Demmers, 2012).

Globalisation and new sources of identity

Identities are transient. People may choose identities as a matter of what is contemporaneously convenient, especially regarding the gain of political and economic resources at a certain point in time or location, and achieving stability in life (Posner, 2005; Kinnvall, 2004). Processes of globalisation are also beginning to have a large influence on one's personal identity (Kang, 2017). While it is not a new concept, globalisation is occurring now at such a rapid pace with the help of advances in technology, that it is affecting ever larger amounts of people politically, socially, and economically. Furthermore, the rise of mass communication and the accessibility of networks on a worldwide scale have led to a rising salience of certain identities over others. Online networks such as Twitter, Instagram, and Facebook, among others, have facilitated mobilisation, especially in regard to assembling armies, as in the case of the Islamic State of Iraq and Syria (Wiktorowicz and Amanullah, 2015). Overall, as globalisation continues to take place, grasping the concept of identity will be increasingly critical to understanding conflicts.

It is important to understand, therefore, what leaders seeking to understand how to mobilise support may focus upon. One factor may be radicalism. Walter (2017) notes that the more extreme a rebel group is, the more power they gain in society. Those that have more moderate beliefs fail to reach the same level of dominance socially and politically. Groups with extreme ideologies have more advantage over groups with moderate ideologies, "especially in environments of heavy competition, weak rule of law, and bad governance" (Ibid., 1). This is especially true in Muslim majority countries in the Middle East and Africa. Radical Islamist groups are on the rise and leaders of terrorist organisations are becoming more aggressive in their mobilisation, recruitment, and means of control.

According to Walter, there are three obstacles that radical groups have to overcome to become more dominant. The first is establishing a level of

"collective action" in which rebel leaders can ensure that supporters will remain loyal. Within moderate groups, rewards are monetary and material, whereas extreme groups – which often incorporate religion into their cause – promise bliss in the after-life, which is eternal as opposed to temporary. Conveniently, it is also free. The second is identifying a "principal agent". This agent is a leader that has the responsibility of making decisions for the group. It is common that followers may not necessarily believe in the cause they are fighting for. The act of forming or joining a group is often a matter of self-interest or convenience. When you have a principal agent, he or she can factor out who is and is not really dedicated to the cause, thereby reducing the risk of betrayal. The third obstacle leaders may be conscious of is the "destabilising commitment" problem. Leaders need to ensure that followers will not defect from the cause once they (the leader) have achieved power. They do this by communicating to the group that they are making just as many personal sacrifices as the rest.

In the context of civil war, Walter notes that when these factors are all taken into account, meaning extremist groups outperform moderate groups. During times of political instability or corruption, society becomes more polarised (Makrehchi, 2015), and when such division occurs, people tend to drift into separate factions, some extreme and some moderate. The rise of extremist groups in the Middle East and North Africa since 2003, primarily in contexts of weak institutional constraints, proves that "scholars can no longer close their eyes to the role of ideology in civil war" and that extremist groups pose one of the biggest international security threats (Walter, 2017: 31).

The role of group exclusion

Mounting dissatisfaction can eventually increase the propensity of groups and individuals to engage in political violence and crime. Justino (2017), like other observers identified above, notes that ordinary citizens, living in high-inequality countries or weak states – states who are unable to provide basic functions to individuals such as taxation and the rule of law – are excluded from political decision-making. Their exclusion is often as a result of neo-patrimonial power structures in which political parties draw support from ethno-regional or other social groups rather than policy beneficiaries (Mamdani, 2018). Moreover, governments in weak states are more susceptible to experiencing challenges from opposing political groups as they are more vulnerable to military, economic, and political crises.

The lack of accountability for past crimes can also exacerbate grievances and lead to further conflict. Payne et al. (2018) conducted a study to provide an initial exploration of the relationship between conflict recurrence and a selection of legal factors, including: The establishment and function of constitutions, transitional justice processes, and human rights institutions. In their study, they found that "new constitution and trials of certain perpetrators of violent crimes are correlated with conflict non-recurrence." Moreover, their "findings suggest that international agencies could most directly target conflict non-recurrence by focusing, first, on the creation of new constitutions and the promotion of prosecutorial mechanisms to advance accountability for middle and low level perpetrators of abuses." (Ibid., i).

On the other hand, strong states – states that provide a stable political, legal, and economic environment for citizens – are more likely to maintain peace as they have more inclusive institutions. Strong states are characterised by anti-discrimination legislation. These policies prevent social mobilisation — "the social and political process through which individuals come together to achieve that common interest" — from becoming violent (Justino, 2017: 4). As a result, violence is unlikely to materialise in societies where groups cooperate and interact with one another. In fact, Nygård et al. (2017b) found that most participants to violent movements are members of a social minority.

To better understand how exclusion interacts with drivers of conflict, Nygård et al. (2017a) reviewed different types of inequality in Africa (objective vertical and objective horizontal as well as perceived vertical and perceived horizontal). Vertical inequality is inequality among households or individuals. Horizontal inequality are inequalities among groups, specifically shaped around culture, such as ethnic groups and religious groups. Perceived inequalities are people's perspectives on the inequality itself. They note that there has been a shift over time in the primary driver of violent conflict from vertical inequality to horizontal inequality, and that high levels of perceived political and economic horizontal inequality make violent conflict more likely. The way that people perceive inequality plays a key role in mobilising, recruiting, and retaining people in the lead-up to and during conflict. The authors further add that elites play a key role in perception, as they have the ability to amplify or mediate it, or even fabricate it completely.

They also found that horizontal inequality appears to be decreasing, which will mitigate the risk of future conflict. In addition, there are policies that can effectively reduce horizontal inequality, thereby further minimising the risk of conflict. Examples are territorial decentralisation, better education, and power-sharing in the military and government.

For these reasons, perhaps, broad political participation is considered to be prominent in preventing civil war recurrence. Peaceful channels of participation help reduce grievances and prevent new conflicts from becoming violent. Fiedler (2017) notes, if peaceful channels to participate beyond national elections exist, previous and potential future rebels can explore them to solve potential conflict instead of resorting to violence. Peaceful channels, such as an active civil society and subnational elections — either local or regional — are significantly and regularly related to a reduced risk of civil war recurrence. She further finds that parties who want to implement policy change do a cost-benefit calculation before acting. Peaceful channels are a less costly strategy than war. "However, this changes if peaceful channels to participate do not exist, if the rebels believe they can win or that they can renegotiate a more favourable settlement", or if the cost of war is seen to be comparatively low and expected benefits high (Ibid., 6).

Constraints on the executive also are cited as important in decreasing civil war recurrence. Institutional constraints make "a polity more inclusive and prevent electoral winners from excluding and aggravating election losers." States that effectively constrain electoral winners from punishing and marginalising losers reduce conflict risk by preventing new grievances from emerging and becoming violent. In addition, constraints on the executive branch can also prevent election winners from excluding political rivals from governmental positions (Ibid., 2).

Gaps in the literature

We know much about the triggers and dynamics of conflict as they relate to matters of social exclusion and radicalisation. Yet, this knowledge has not necessarily translated into effective prevention, particularly for societies that experience violence recurrence. Nygård et al. (2017b) found that 41% of post-conflict societies return to violence. They calculated that "a (low-income) country with no previous conflicts that experiences 2-3 years of conflict will have nine additional years of conflict over the next 20 years, compared to one that remains peaceful," and add that armed conflict has strong "trapping effects", meaning conflicts involving weapons are much harder to end (Ibid., 11).

While multiple drivers of conflict are observed in the literature, little is known about the relationship between drivers, including between macro-drivers, grievance, and public discourse. The United Nations and World Bank study (2018) on conflict prevention, for example, cites group-specific grievances surrounding access to political participation, land and resources, justice and security, and public services (Ibid.), but we know little about, for example, how public discourse relating to specific justice processes or institutional integrity, drives grievances. Different institutions or justice processes affect people in different ways, to different degrees, and enjoy variant levels of public technical understanding. Social science is yet to begin exploring these questions, let alone attribute levels of influence to leaders, elites, or other social strata.

In fact, from the literature above, it emerges that little is known about decisions regarding the triggering of conflict by individuals, and how this interacts with broader conflict drivers such as exclusion and grievances. Nygård et al. (2017a) noted, for example, that elites play a key role in fomenting – even creating – perceptions of inequality that can lead to violence; however, quantitative cross-national or national data indicating the nature of the role played by elites has not been gathered or analysed.

Similarly, Fiedler (2017) points out that political actors do a cost-benefit calculation before choosing violence over peaceful means. If the cost of conflict is seen to be comparatively low in relation to the expected benefits, then that course of action is preferred over peaceful ones. Yet, indicators for whether leaders believe peaceful methods or violent ones are preferable have not been scientifically demonstrated. This is an important gap in the literature on conflict drivers and conflict prevention, as well as in the exploration of online speech.

Language, media, and political change

Media and conflict

The role of media in conflict-ridden areas has changed significantly in recent years. The media is a multi-dimensional tool, which has an important relationship with conflict. Both the media and conflict are irregular and complicated, with no structured processes. The media plays various roles in regard to both the government and the public, and has the ability to herald change in society. It has

the capacity to educate citizens about policy and current events, while holding governments accountable for their actions. However, for the media to have a positive impact, the "public sphere must have free access to information and enable ordinary citizens' views to be heard" (Betz, 2018: 1). That being said, Betz acknowledges obstacles, including unequal access to media and the difficulty of measuring the reliability of sources. For the media to benefit society, she states, policymakers need to focus on how the media can be utilised in a non-violent way to combat conflict.

Sargsyan (2017) notes that the media has the power not only to shape perceptions and emotions, but to use these to potentially mobilise a community to violence. She conducted a study to understand how political entrepreneurs use narratives, shape perception, arouse emotions, and manipulate memories, often through the media, to mobilise individuals to collective violence. She believes that these factors play an important part in politics, for they refer to how an individual reacts and makes sense of facts and events that happen in one's reality.

Narratives can "influence people's perceptions of identity, culture, politics, and reality more broadly, [as] they are key to both shaping behaviour and producing change." In this regard, narrative "entrepreneurs" play a vital role in society, due to the fact that they are "individuals who generate and spread new norms" (Ibid., 7). These narratives can be used to predict or explain violent mobilisation. For example, one narrative can cause civilians to fight while another can cause them to flee. This was seen in the Abkhaz-Georgian War of 1992-1993. In the war, Abkhazians learned that they were in danger, which led them to joining the fight against advancing Georgian forces. On the other hand, "individuals who did not strongly identify with the group and with local social structures prioritised personal security and fled, hid, or remained neutral" (Ibid., 8).

Moreover, as a result of the power of perception in influencing how narratives are received, rebel leaders may opt to "launch a psychological offensive to shift the attitudes of uncommitted civilians and encourage their participation in collective violence." Leaders of rebel groups are known to commit acts of violence and manipulate violent images that portray strength to civilians, to promote the perception that they are winning against the government. It is the level of perceived strength that determines how likely civilians will support the rebels or the government. Overall, Sargsyan finds that rebel leaders aim to achieve three types of perception effects from rebel violence: Agitation, provocation, and demonstration. Agitation is a form of propaganda to persuade popular attitudes in favour of rebels. Provocation is defined as rebels "instigating the state into applying excessive force or indiscriminate repression against the population and thereby alienating civilians from the government." Lastly, demonstration aims to create an illusion of government weakness and rebel strength (Ibid., 9).

The individuals delivering these narratives must have legitimacy locally and must generate powerful emotional messages. For this to happen, the discourse must be delivered, interpreted, and received in a "permissive" structural condition. Permissive structural conditions are poor socioeconomic and security environments that do not meet the needs of civilians. These individuals are usually homegrown leaders who have gained legitimacy by suffering like the local population. For example, during the violent social movements in Iraq from 2003-

2011, homegrown leaders — such as Muqtada al-Sadr, an Iraqi militia leader — focused on "capitalising on the collective emotions of anger, humiliation, and fear" and therefore "sustained violent collective action and became a potent political figure", whereas foreign-born aggressors — such as Jordanian militia leader Abu Musab al-Zaqawi — "failed to maintain popular support" (Ibid., 11).

Emotions can also lead to another type of violence, referred to as "ethnic violence." Ethnic violence is an intense and devastating attack by individuals belonging to one ethnic group on individuals belonging to another ethnic group. Here, mainly four emotions are found to be at play by Sargsyan; rage, hatred, resentment, and fear, with resentment being the strongest. "For example, exogenously induced changes or sudden shocks — such as war or loss of government stability and protection — activate fear in people and provoke an attack against the group perceived to be most threatening" (Ibid.). Violent experiences generate the emotions of anger and fear; prejudice and stigma give rise to contempt and hatred; and status reversal fuels resentment. Emotions, therefore, serve as resources (similar to weapons and money) for conflict entrepreneurs, who use them against enemies with superior material capabilities.

Furthermore, in addition to narratives, perception, and emotions, collective memory also plays an important role in the outbreak of violence. Scholars such as Emile Durkheim, Gustave Le Bon, Jacques Le Goff, and William McDougall, put forth the idea that groups have communal memories and minds, just as individuals do their own. This concept of collective (or historical) memory — introduced by Maurice Halbwachs — is possibly more powerful than an individual's memory, for "it extends beyond autobiographical memory and experience to encompass the facts and events that occurred before one was born, and provides a social framework for the development of individual memory" (Ibid., 13). Memories of conflict and war form a continuum that allows individuals to link past injustices to current suffering and aids in legitimising the use of violence. In this regard, memories and emotions are just as important as cognition and reason to taking political action and making political decisions that can cause acts of violence.

In all of this, modern mass media plays an important role, for it is able to "amplify the effects of narrative, perception, emotion, and memory in mobilising violence… and facilitate the diffusion of propaganda and emotions and influence perceptions" (Ibid.,16). It is important to note that while in some cases "access to media has influenced public perceptions negatively and contributed to violent mobilisation," in other cases "media has played a positive role" (Ibid.,17). For example, in the Western Equatoria State of South Sudan, those who received radio broadcasts expressed a rise in fear of the Lord's Resistance Army (LRA) when compared to those who did not have access to this form of media. In addition, those who expressed a rise in fear also expressed a rise in support for militias that provided them with protection that the state forces, the Sudan People's Liberation Army (SPLA), did not. However, other studies confirm that radio stations, such as the ones operated by the United Nations, helped decrease violent conflict in countries such as Liberia and Cambodia.

In sum, for Sargsyan, narratives inform people's cultural self-image. Perception, whether supported by evidence or not, informs individual behaviour and decision making. The use of emotion within rhetorical narratives is influential when mobilising to collective violence. Finally, memories of events such as war

and conflict are used to motivate and reassure that actions are justified. Leaders can use these as tools to incentivise and justify collective violence, including violence that draws on social group-specific grievances (Ibid., 7). In some instances, the manipulation of these emotions by leaders can lead to civil war. Collier et al. (2003) found that civil war is associated not solely with economic variables, such as the availability of extractable natural resources and low income, but also with subjective variables such as the ones described above.

Evidence of language's impact on politics

Language matters, and certain linguistic configurations have a higher impact than others. Barasa and Ndambuki (2016) found that in political discourses, the increased use of modal auxiliary verbs – such as will, shall, can, must, should, would, and need – is critical when trying to persuade others and convey a sense of trust and commitment. Likewise, researchers found that when speakers reproduce specific parts of a prior utterance, they are more likely to reach their communicative, cognitive, and collaborative goals (Du Bois and Giora, 2014).

Matsumoto et al. (2012) found that speeches made by world leaders can influence and increase Acts of Aggression, or "AOAs", depending on which pronouns are used. In speeches, the use of words such as "we" suggests attention to one's in-group. Moreover, leaders choose their words carefully to portray a sense of belonging and inclusion that justifies aggression against the out-group.

In another example, Dowell (2011) found that leaders' language changes before and after a political crisis. The author investigated characteristics of Fidel Castro's speeches before and after the Cuban Missile Crisis in 1962. Using two computational linguistic tools (Coh-Metrix and Linguistic Inquiry Word Count), findings supported the argument that leaders' rhetoric and language changes after a crisis, becoming more simplistic and upbeat. Analysts have also used linguistic content analysis – a technique of encoding textual data by classifying key words and finding the relationships among those words – to research topics like whether a politician is lying, or whether a leader wishes to take a country to war (Smith, 2013).

Tones change as tensions rise. Online language tends to quickly radicalise at the onset of social or political conflict. This is particularly true in societies that are already highly politically polarised. To study this change, Mahkrenchi (2015) created a metric identifying and calculating the difference between neutral and radical language in social debates, and proposed a concept called the "Language Gap" to considers the relationship between the use of extreme language and political crises.

His analysis of the Iranian Farsi blogosphere during the 2009 presidential election delved into the theory of a Language Gap. By manually gathering popular terms from 120 Iranian blogs, Mahkrenchi was able to refine the number of most commonly used political terms down to 183. The terms were divided into three categories: L ("politically left" or liberal), R ("politically right" or conservative), and M ("mainstream" or neutral). Examples of an L term would be "dictatorship", which political left people would use to refer to a conservative, controlling government. An example of an R term would be "socialist",

in reference to what the political right would call progressive people. By geolocating areas in which L, R, and M terms were used, Mahkrenchi concluded that more extreme (or L and R) terms were used in posts on social media by those who were geographically closer to the physical location of the conflict. More M terms were used in posts by those who were located further away from the conflict. His findings revealed – with up to 90% accuracy – that increased polarisation of language routinely prefigures social and political crises in an area.

Social media is increasingly viewed as a strategic tool that changes how conflict participants fight. For example, it is used to track conflict, to attract political and material support, and to improve the odds of success. Zeitzoff's (2016) study focused on how international public support through social media can influence conflict dynamics. He constructed a disaggregate data set — numerical and non-numerical information collected and grouped together by categories — from social media sources relating to Israel and Hamas during the 2012 Gaza Conflict. To gather his data, he created nine conflict related variables (such as the attention of the mediators and levels of public support) and tracked them every hour during the 179 hour long conflict. He employed a statistical analysis to learn if Hamas and Israel based their actions on changes in international public support.

By using this model, Zeitzoff concluded that shifts in public support can change conflict intensity. If there is an increase in support for an actor, then rival actors will decrease their conflict intensity. The study also suggests that changes in international public support on social media has a greater influence on conflict participants than international mediators. An increase in attention from international mediators (US, UN, Egypt) actually increases both actors' conflict intensity. Interestingly, "while increases in public support for Hamas constrains Israel's militarily, it actually increases the activity of its communication on social media" (32). Social media allows states and actors, particularly those with limited financial means, to sway opinions and communicate to both domestic and international audiences.

Social media can also be "weaponised" for peaceful, democratic change. Udanor et al. (2016) studied social media's influence on the 2015 Nigerian presidential election. They used a program called NodeXL – which uses algorithms to find relationships on Twitter such as exchanges and mentions – to extract data from over 5,000 accounts that tweeted or retweeted a post using the hashtag #NigeriaDecides. Influential actors on social media tend to have high in-degree and out-degree levels, or a large number of incoming and outgoing connections, as their opinions reach a wide audience. The researchers found that the most influential actor in the Nigerian election was *Sahara Reporters*, an online news outlet that promotes citizen journalism, especially reports on corruption in the government. *Sahara Reporters* encouraged citizens' participation online, which was a key factor in exposing the corruption occurring in Nigeria's incumbent presidential administration. This contributed to a surprisingly large victory for the opposition candidate.

In another study Mooijman et al. (2018) collected tweets relevant to the 2015 Baltimore protests. The tweets collected extended across several weeks and included periods of both peace and violence. Their objective was to see if the rise in violence was a result of individuals' increased moralisation of a cause, and the degree to which those individuals believe others moralise the cause.

Morality was the main focus of the study because once a protest is effectively moralised, they say, it turns into an issue of right and wrong as opposed to mere personal preference. As a result, moral sentiments can establish the foundation for violence at protests. Moreover, if individuals see protests as a moral issue, their attitudes are more definitive and less likely to change.

In their study they found "that not only did the degree of moral rhetoric used on social media increase on days with violent protests, but also that the hourly frequency of morally relevant tweets predicted the future counts of arrests during protests, suggesting an association between moralisation and protest violence" (Ibid., 1). Furthermore, "moral language used on online social networks can be directly linked to violent protests, implying that online social networks can also be used by policy makers to track and predict the emergence of violence at protests" (Ibid., 21). They note that "strong moral convictions can increase the acceptability of violence and that this happens mostly when convergence is high" (Ibid., 20). Convergence occurs when different parties or groups with different ideologies come together to support a single cause.

Language on social media networks, which has come to be seen to "reflect current public opinions, sentiments, and trends, in a local or global community" (O'Connor et al., 2010: 85), can therefore have a very real impact on politics. Politicians, policymakers, and researchers now have to take online discussion into account in understanding the dynamics and triggers of conflict and political change.

Leaders' speech and public discourse

Findings around the topic of the effect of language on politics prompt questions about the impact of leaders' speech on public discourse and conflict. While a study to identify the specific language of leaders that is associated with conflict onset has not been undertaken, many studies have considered how public opinion is shaped by leaders' remarks, including surrounding social group-specific or violent conflict-specific issues.

Cohen (1995) concludes that the public cares more about certain issues as a result of more time dedicated to it in the State of the Union Address. Page and Shapiro (1984) make similar findings, while emphasising the role of the particular president's popularity on their ability to shape public policy preferences. Edwards (2003) observes the bi-directional nature of the attention an issue receives, noting that a president is also more responsive to the public in his speeches on issues he knows the public pays attention to. Gershkoff and Kushner (2005) related the high levels of public support for the 2003 invasion of Iraq to the administration's framing of it as part of the War on Terror. Additionally, Bligh et al. (2004) were able to use textual analysis to assess change in themes and certain elements of President Bush's speeches and media coverage on either side of the 9/11 attacks. Both studies used the case of President Bush to reinforce the idea that presidential rhetoric matters in response to, and in shaping the narratives of, a crisis.

Zaller (1992) developed a comprehensive theory that explains how individuals choose political preferences based on information obtained from the media they are exposed to. Information in the media, in turn, the author argues, is shaped

largely through elite and leader discourses – since actions and utterances at the elite level set the tone for further discussion among citizens. The theory rejects the notion that individuals have structured beliefs and political preferences that cannot be changed, finding instead that individuals – particularly those who are otherwise not very involved in politics – assimilate information quite uncritically. On the other hand, individuals who are more politically aware are less likely to have their beliefs altered after being exposed to news and information from mass media and the elites. This finding emphasises the importance of identifying the intent of elites, particularly those that have the capacity to utilise the media to trigger violent conflict. This becomes important in that elites have greater capacity to shape the perspectives of persons less involved in politics through their capacity to expose persons to news and information.

Schaffner (2017) conducted a study on the "Trump Effect" – the belief that Trump's offensive and prejudiced rhetoric in events leading up to the 2016 US presidential election, caused people to express more prejudice toward out-groups. An out-group is a social group with which a person does not identify. The study focused on how words and cues during an election can affect an individual's opinion about certain out-groups. Schaffner uses data from the 2016 Cooperative Congressional Election Study (CCES) pre-election questionnaire, which was composed of "1,186 non-Latino white respondents who were interviewed between September 28th and November 6th." The purpose of the study "was to test whether respondents who were exposed to Trump's offensive comments about minority groups would express more negative sentiments about those groups themselves" (Ibid., 6).

Schaffner finds that individuals who are exposed to Trump's quotes about Mexicans are more likely to make offensive or negative remarks about Mexicans, Blacks, and Millennials. He also finds that individuals took the offensive quotations as a sign that expressions of prejudice are becoming more socially acceptable. Moreover, Schaffner also finds that individuals who do not interact with out-groups are more likely to hold higher levels of prejudice. The fact that the use of negative rhetoric is not seen as being as inappropriate as in the past, is allowing politicians to feel that they can use explicitly prejudiced rhetoric during their campaigns. For Schaffner, these actions will result in "increasingly heightened inter-group tensions which pose a threat to political and social stability in the United States" (Ibid., 21).

A large portion of the research discussed thus far makes it clear that quite often politicised language, particularly that of leaders, relies on the exacerbation and/or creation of group differences and in-group solidarities. This sits well with the findings in the previous chapter that states that group exclusion/inclusion play a significant role in the dynamics of triggering political violence.

There is evidence in the literature to support these claims. Leyens et al. (2000: 186) argues that "most individuals are sometimes tempted... to treat other groups as 'infrahumans'". The concept of infrahumanisation is described as perceiving someone as less human. They investigated secondary emotions such as affection, pride, remorse, and admiration through an essentialist perspective. Their essentialist perspective is one that chooses to perceive secondary emotions as connected to "human essence." The study concluded that people attribute secondary emotions to their in-group, while denying such emotions to, and thus infrahumanising, outgroups. Moreover, they found that attributions or

denials of secondary emotions are not dependent on social constraints, such as stereotypes, but may come and go more easily. This coincides with their finding that in- and out-groups are malleable and context dependent. For example, Canarians and Peninsulars are considered to be in two different in- and out-groups in Spain, however, when confronted with a Portuguese group they both identify as merely Spanish.

Cortes applied the infrahumanisation theory to the familiarity hypothesis in the study of in-groups and out-groups. The familiarity hypothesis states that the more one is familiar with information presented to them, the more comfortable they are with it. This hypothesis predicts that "individuals will attribute more secondary emotions to the self than to the in-group, and more secondary emotions to the in-group than to the out-group, because the self is more familiar than the in-group, and the in-group is more familiar than the outgroup" (2005: 3). To explore this hypothesis, 73 students from the University of La Laguna were asked to describe themselves as an in-group or an out-group. It was seen that participants applied more information regarding feelings such as likes, dislikes, and values to describe themselves as opposed to other people. Specifically, participants used such language 32.7% of the time when describing themselves, but only 16.7% when describing familiar others, and 8.4% when describing unfamiliar others.

Limits of automated text analysis

Many of these studies that look at language in politics use automated text analysis software to parse through large amounts of textual data. There are a host of difficulties when using computer programs to extract meaning from text. One is that words can convey information that goes beyond what the actual words mean (Labov, 1965). In many instances, the way something is said can be more important than what is actually said. An individual's choice of wording can unveil many things about them such as family background and economic class. This in turn can modify the intent implicit in those very words (Duranti, 2009). Rhetorical elements in textual data, that are often difficult to understand from outside a specific culture, can also influence meaning (Ordonez et al., 2017).

Language analysis technologies therefore require a level of sophistication necessary to provide an in-depth look at text that goes well beyond the tallying of positive and negative words, providing indications as to people's emotions and thought processes as well. Pennebaker et al. (2007) have attempted to address the issue by developing the Linguistic Inquiry and Word Count (LIWC) program – a computer program that provides an efficient way to study emotional, cognitive, and structural aspects in text – to study the use of language in certain documents: Specifically, blogs, scientific articles, novels, and speeches.

The LIWC application divided words from a standard dictionary into four groups: Linguistic categories, psychological processes, personal concerns, and spoken categories. The LIWC then ran through target words – or words extracted from a file – and processed them one by one. For example, take the sentence "Um, I am nervous at work." The word "um" falls under the spoken category, for it is a murmur. "I" falls into the linguistic category, as a first person singular pronoun. The word "am" would fall under the same category as a verb.

"Nervous" would fall under the psychological category for it represents an emotion, specifically a negative emotion. The word "work" would fall under the personal concerns category, as it represents an aspect of one's personal life. The program then analysed documents word-by-word to divide the pieces into emotional writing and content writing – or writing with feeling or without feeling.

In another study, Pennebaker and Tausczik (2010) divided all words into two broad categories: Content words and style words. Content words are words that convey or describe content, explaining what is being said. These are generally nouns, adjectives, and regular verbs. Style words convey how people communicate. These words require basic social skills to use and understand. These are generally pronouns, prepositions, auxiliary verbs, and conjunctions, among others. In the sentence, "Um, I am nervous at work," the content words are "am," and "nervous," for they describe the situation in a way that requires no knowledge of context. The style words are "I" and "at work," due to the fact that unless one is familiar with the situation being described, it is unknown who the subject ("I") clearly is and where the subject "at work" is located as it is not explicitly stated.

Using LIWC, researchers found different rates of usage of certain categories of words depending on the text being analysed. Sentences such as the one mentioned above would fall under the emotional writing category. Their findings showed that blogs had higher rates of emotional words than scientific articles did, as the former generally recounts personal experiences as opposed to the latter, which consist strictly of systematic information with no sentiment. Context is also very influential; for example, novels and speeches vary in topic. A fiction romance novel will be more emotional than a non-fiction biography; and a motivational speech will contain more emotion than a general lecture.

Another study by Chung and Pennebaker (2007) investigated "how word use can reflect basic social personality, cognitive, and biological processes." They found that function words – i.e. words that are "the cement that holds the content words together," for example "I," "the," "and," "to," "a," and "of" – can in fact "reveal a tremendous amount of information about our social interactions and personality" (Ibid., 344-355). This study also relied on LIWC, counting the function words in essays that were related to positive and negative emotional categories. The results were analysed in view of finding a link between function word use and specific types of psychological activity. The authors found that function words reflect the introduction of thoughts, feelings, and personality traits, and "set the tone for social interactions" (Ibid., 355).

Abe (2012) investigated different cognitive styles in online comments in connection to positions on war. The study used LIWC to examine responses to an online discussion titled "Should the United States Declare War on Iraq?" The purpose was to classify different groups of commenters as "pro-war," "anti-war," or "neither," and identify their different cognitive styles. The data was collected from a Wall Street Journal online discussion forum from August 2002 to February 2003. The study differentiated between two cognitive styles. Cognitive processing ("the degree to which a person is actively searching for causes and explanations and seeking to make sense of events") and cognitive complexity ("the degree to which a person differentiates between multiple competing solutions and is attempting to integrate among the solutions"). Cognitive processing is recognised by insight words such as "think," "know,"

and "consider", as well as causation words such as "because," "effect," and "hence." Cognitive complexity on the other hand is recognised by words "involved in making precise distinctions", such as exclusive words, tentative words, and negations, as well as conjunctions integrating several thoughts together (Ibid., 213-214).

The research revealed considerable differences in the cognitive styles of different groups. For example, the pro-war group "scored lower on cognitive processing than the anti-war group and scored lower on cognitive complexity than the 'neither' group." The author proposes that this can be explained by the fact that a simplistic style of information processing is often associated with military action support. However, Abe also noted that the pro-war group's high use of time-related words reflecting urgency shows a time pressure, which may account for their superficial information processing style. Furthermore, the pro-war group was found to focus more on themes outside of the US, while the anti-war group predominantly discussed internal themes. Lastly, the anti-war group used the highest level of words with negative connotations. The frequency of these negative emotions by the anti-war group increased over time, which may be explained by their increasing minority status as opponents of the war. These findings suggest that "individuals who oppose the war generally actively process information but may not necessarily be receptive to diverse points of view" (Ibid., 219).

Much can be surmised using this technology. Yet, a major caveat that remains: LIWC interprets words literally (Pennebaker and Tauszcik, 2010). The program cannot pick up on certain aspects of the context, including irony, idioms, and sarcasm. Take for example the use of the word "mad." It is generally defined as "angry," therefore the sentence "He is mad" means the subject is angry – giving the word a negative emotional connotation. In modern slang, however, "mad" can mean "very," which has no particular emotional effect. To this day, even the best automated text analysis programs struggle with these challenges.

Another challenge of current language identification systems, is distinguishing between similar languages (for example, Bosnian, Serbian, and Croatian) or dialects within the same language (Brazilian and European Portuguese) (Tiedemann and Ljubesic, 2012). Malmasi et al. (2016) carried out an analysis on the performance of state-of-the-art machine learning language classifiers to examine this difficulty. The purpose of the analysis was to explore and learn more about the machine learning classifying system called DSL (Discriminating between Similar Languages). The main findings of the study show that DSL has a perfect accuracy when distinguishing between completely different languages, like Slovenian and Indonesian, but that the system is less accurate when distinguishing between similar languages, like Serbian and Croatian.

There are many variables that can cause errors in the integrity of data that are provided through these systems. For example, it is possible that programs incorporate false or biased information, without understanding that it is false or biased. Another main difficulty here is that software programs may easily misinterpret human instructions due to their inherent lack of context. Kissinger (2018) gives the example of the chatbot "Tay." The machine was designed to converse in the friendly language patterns of a 19-year-old girl. Tay proved unable to properly understand and define the meaning of "friendly" and "reasonable" language as installed by its instructors. Instead, it became inflammatory in its

responses and even racist and sexist. This exposes an underlying ambiguity: "To what extent is it possible to enable AI to comprehend the context that informs its instructions… or will AI, left to its own devices, inevitably develop slight deviations that could, over time, cascade into catastrophic departures?" (Ibid., 1).

Discourse analysis in Kenyan political studies

Introduction to Kenyan politics and media

A problem Kenya still faces is that Kenyan Internally Displaced Peoples (IDPs) are only tacitly recognised but are not offered protection or assistance. Kenyans who suffered violence-induced internal displacement became IDPs as a result of political competition in multi-ethnic regions and historical land injustices. IDPs are very important in politics and elections. Kamungi (2009) states, "displacement changed the electoral demography and predetermined election results" (351). In an effort to obtain the required minimum for a president to be elected – 25% of the popular vote in five of the eight provinces – political parties sought to depopulate opposition strongholds.

In Kenya, land ownership ranks high in socio-economic priorities as people link it to wealth, status, identity, and welfare. Institutions in Kenya took advantage of this as public land was allocated as political patronage to reward politically loyal individuals. As a result, inequality increased and land access was politicised, often along ethno-regional lines, fostering the social group-specific grievances that increase risk of violent conflict (United Nations and the World Bank, 2018). The fostering of these grievances increased the inclination of marginalised groups to take matters into their own hands and resort to violence.

In 1991, in an effort to show support for multipartyism, the Kenya African National Union (KANU) amended section 2A of the Kenyan Constitution to allow for the formation of multiple parties. However, newly created parties could not register for election and their leaders were barred from addressing their supporters. Furthermore, politicians instigated violence to persuade Kenyans that multipartyism would breed ethnic clashes. The instability caused people to relocate permanently to, and buy land in, ethnically homogenous areas. Furthermore, people living in urban areas who supported opposition parties were intimidated by the destruction of their slums and markets, and communities who did not vote for the winning party suffered displacement and dispossession.

Local language media in Kenya is important as it gives people access to information that has an effect on their daily lives. Without it, it is harder for Kenyans to make informed democratic choices. A majority of the population in Kenya – usually the poorest, whom are the most politically marginalised or feel excluded from Kenya's economic success – have for most of Kenya's history had access to only media controlled by their government who they distrust. In 2000, an FM station named Kameme FM, "broke the state monopoly on local language broadcasting." In the upcoming years, local language radio station

numbers increased as new laws further liberalised the media. The main reason for the creation of radio stations was principally for entertainment and profit rather than informational; nevertheless, radio stations increasingly became an outlet for public debate.

Today, Kenyan media is one of the most sophisticated, respected, thriving, and innovative in Africa. Kenyan citizens are increasingly reliant on the media for political news and information. Part of this has to do with the media spearheading the transformation of Kenya from a one-party state to a multiparty democracy. In addition, the media has gained a positive reputation for exposing corruption, acting as a platform for public debate, and is seen as an advocate for the public interest against state power. More recently, observers have found that social media has become an additional alternate means for communication between Kenyan citizens, resulting in increased democratisation (Makinen and Wangu Kuira, 2008).

Yet the media has also been found to bear some responsibility for political violence in the country. The 2007 Kenya general election was believed to be flawed and possibly rigged by both national and international observers. Within an hour of the results, severe conflicts occurred. After watching interviews of 20 senior media figures in Kenya, Ismail and Deane (2008) along with the Kenyan government and international observers found that media organisations, in particular, local language radio stations, fanned ethnic hatred, turmoil, and conflicts. Local stations showed what were identified as clear examples of incitement, as one journalist notes: "The ethnic hate our radio station was propagating about those from outside the community was unbelievable" (Ibid., 323).

In addition, the political co-option of the media by key political figures undermined its capacity to report without bias. Some, like Mitch Odero of the Media Council of Kenya, believe future media policy should address concerns surrounding political ownership of local stations. He believes this would prevent or at least reduce the amount of bias in local stations owned by politicians. It is important to note that some stations aimed to promote peace and defuse tensions after the initial phase of violence from December 2007 to January 2008. Some talk show hosts and journalists tried to reach across ethnic barriers with calls for reconciliation, as people voiced their anger and dissatisfaction with the government, allowing tensions to be defused by public debate rather than violence.

Hate speech and power in Kenya

Kamungi (2009) notes that since the introduction of the multiparty system in Kenya, there has been an increase in the exploitation of political polarisation by Kenyan politicians – including via the issue of internal displacement. Not only does this hamper progress towards resolving serious issues, it ignites further aggression between social groups. This tool is especially used by elected leaders to enforce their authority (Peter et al., 2016), despite the fact that the grievances caused to specific social groups are precisely those associated with increased risk of violent conflict (United Nations and World Bank, 2018).

A study conducted by Bichang'a and George (2011), which analysed

newspaper headlines prior to the 2007 election, found that hate speech in the Kenyan media contributed to fuelling tensions. The authors proposed violence prevention via the implementation of laws to regulate content reported prior to general elections. To make the election process more peaceful, transparent, and fair, the Uchaguzi project was implemented to monitor the 2013 election, identifying and reporting instances of hate speech (Lucas, 2014). Hate speech has been described by some as a strategy of purposely eliciting people's negative emotions to assert political objectives; which, when coupled with the availability of small arms, can further escalate a conflict (Wezeman, 2003; Hartung 2015).

Peter et al. (2016) conducted a study on hate speech as a pragmatic strategy to proliferate socio-political dominance in Kenya. They collected data from the Kenyan Hansard containing recordings of parliamentary debates from the National Assembly. Through the use of a "guiding card," based on several defined elements of hate speech such as, "speech that solicits disdain against a person/group because of their ethnicity" or "makes use of cultural stereotypes," they located speeches with possible utterances of hate (Ibid., 82). These texts underwent a Foucauldian discourse analysis, studying how the orientation of the speech expresses power, to determine the use of manipulative language with the intent to increase dominance over other people or groups.

The study focused on parliamentary discussions as the political polarisation and increased tribalism in the National Assembly since the 1990s (Hirsch 2013) created the optimal antagonistic environment for hate speech to thrive. The authors used certain parameters to identify an environment fostering hate speech, including "a source and an audience, or a hate speaker and a hate listener" (Murray, 2011 cited in Peter et al., 2016: 80). There must also be a platform, media outlet, or channel for such speech. The Kenyan Parliament fits these parameters because it is an outlet where members enjoy immunity, protecting their utterances during parliamentary discussions. The authors acknowledge that such freedom fosters candid discussions, but that it also might lead members of parliament (MPs) to use language in an often unintentionally careless way that may foster hate.

Among others, the paper cited Dershowitz's (1992) definition of hate speech and his argument that utterances do not require intent to be considered hateful. The language used by parliament members therefore, according to Peter et al., fits this definition of hate speech, and conforms to Weber (2009) and Yasemins' (2010) findings that hateful utterances are often hidden behind seemingly plain and harmless discourse. A natural subsequent line of inquiry is whether that speech is readily observable and whether when leaders or influential actors employ such language it shapes public discourse and behaviour.

The results of the study found that MPs, intentionally or carelessly, "used explicit and implicit forms of hate speech such as inflammatory statements that were offensive and provocative" fuelling socio-political disputes. The focus of debate became centred on the attempt "to coerce others to support, embrace, or reject some people and to incite others against the establishment" (Peter et al., 2016: 84). The intention behind these utterances was to display or increase socio-political dominance.

A more balanced study by Somerville looked at the influence of vernacular radio stations on inflammatory political discourse and violence during periods of

socio-political tension in Kenya. The author first defined hate broadcasting, then analysed the socio-political environment in Kenya with an eye to the history of political discourse, then, in light of the definition and the context, examined the behaviour of radio stations accused of hate broadcasting, and then compared it with that of Radio Television, Libre des Mille Collines (RTLM) during the Rwandan genocide "in terms of the dissemination of fear, hatred, and the incitement to murder" (Ibid., 83).

The study revealed that Kenyan vernacular radio stations have a partisan agenda that influences discourses. For example: "local candidates were supported and praised, while the representation of opponents was couched in inflammatory language." Somerville described such behaviours as "lacking any clear standards of impartiality, balance, and responsible journalism" and recognised that "some statements that were broadcast could be interpreted as inciting violence." However, comparative to Rwandan media discourse surrounding the genocide, Somerville found that hate speech in Kenya did not reach the same impact levels. In fact, despite occurrences of hate speech, the research found that vernacular radio stations in Kenya "played no discernible role in setting an agenda for the extermination or systematic ethnic cleansing of groups" (96-97).

Lexical choices of political and media actors

As part of a larger project aimed at analysing discourse strategies employed by former President Mwai Kibaki and former Prime Minister Raila Odinga during the formation of the Kenyan Coalition Government in 2008, Barasa et al. (2016a) specifically explored the role of modal auxiliary verbs in ideological manipulation. Modal auxiliary verbs, such as "can," "could," "may," "might," and "must," are verbs expressing the degree of a speaker's involvement in a discourse (Palmer, 2001), and can encompass high or low modality, respectively reflecting strong or weak authority. Barasa et al. (2016a) focused on two types of modality to investigate manipulative capacity, and how it reflects power relations and ideology. Epistemic modality refers to the level of confidence in the truth of the utterance; and deontic modality reflects interpersonal power of the speaker relative to other participants. The deontic modals were further divided into the sub-categories of permission, obligation, and desirability.

They analysed four written political discourses from the 2008 post-election consultation between the two coalition leaders. The power sharing accord signed by Kibaki and Odinga in 2008, demanding a collaborative relationship between the two leaders, created the perfect environment for the authors to investigate ideological manipulation. The samples were collected from the former president's official website and the news source, *African News*. The texts, classified as official letters and press releases, were picked from the same group of dialogues to "reveal continuity in the negotiation process." Instead of analysing each text individually, a holistic contextual view was created by organising the texts along an "initiator-response structure of negotiation discourse" (Ibid., 10).

The results of the study found that "Raila Odinga and Mwai Kibaki use deontic modals frequently in their discourse to signal authority and power" (Ibid., 18).

Modals expressing "permission to carry out a specific function" were used by Mwai Kibaki three times, while this modal was not employed by Raila Odinga at all. Moreover, "the prototypical modal of obligation in the data is 'must' and both speakers use it. It can be observed that Raila Odinga employs heavy use of 'must' more than his counterpart, Mwai Kibaki" (Ibid., 15). The study also found that Raila Odinga expressed modals of desirability eight times as opposed to three times by Mwai Kibaki.

The study concluded that the two coalition leaders did indeed employ modal auxiliaries during the 2008 post-election consultation in Kenya. The authors found that "modals are not only just linguistic elements, but political strategies and ideological tools in political discourses" (Ibid., 18). Finally, in light of the increased number of coalition governments in Africa, the authors ask coalition leaders to be responsible with the use of modality in their discourse to avoid contributing to socio-political unrest.

Another study by Barasa et al. (2016b) was focused on lexicalisation — the process of choosing words (Janks, 2009). In this study, the authors sought to demonstrate that lexicalisation strategies employed by Odinga and Kibaki influenced the post-election consultation, which resulted in resolution and averted further socio-political violence. By doing so, the authors sought to demonstrate that language has an important role in power sustention and appropriation that can be utilised to consolidate peace. They found that "lexical choices such as 'invite,' 'appeal,' 'willing,' 'hoping,' and 'looking forward to' depicted both principals (leaders of the coalition government) as being personally committed to the negotiations," though both still showed signs of antagonism, for example: "Though Kibaki smoothed over divides by using amicable, personalised, and mitigated language, his lexicalisation reveals the propagation of single-party domination over the Grand Coalition Government." Nonetheless, they found overall lexicalisation to reveal "sustained tolerance and optimism and also reassurance for continued political support notwithstanding the struggle of power" (Ibid., 90). The study concluded that the lexical choices employed helped streamline further negotiations and sustain the signed agreements. The link between lexicalisation and the creation of political trust demonstrates the power of language as a tool that can help sustain peace.

Lexicalisation can go the other way around, too. A study conducted by Nyagioti and George (2012) revealed that media discourses were "expressing and legitimising unequal power relations, ethnic animosity, and personalised politics" during the 2007 Kenyan election campaigns (42). The study reviewed four mainstream local newspapers: *The Daily Nation, The Standard, The Kenya Times,* and *The People Daily*. Fourteen headlines from these newspapers were examined using the Critical Discourse Analysis (CDA) method. The method is described by Fairclough (1995) as the study of language as a social practice and is considered as preferable to other methods by the authors because it is interpretative, explanatory, self-reflective, and constructivist.

Using this method, Nyagioti and George analysed the linguistic constructions of the headlines according to several characteristics; such as, "referential, prediction, perspectivation, argumentation, and intensification or mitigation strategies". Referential strategies involve the use of "naturalising and depersonalising terms" that influence the construction of in- and out- groups. For example, one of the headlines "My Style, his style" from The Standard, uses

the words "my" and "his" to separate two groups. Furthermore, the strategy of "prediction" refers to the use of stereotypes, and "argumentation" to the "justification of positive or negative aspects." The use of "perspectivation", also called "framing", was found in the headline: "Is Kibaki avoiding Ralia's Turf?", from *The People Daily*. It is not intended to provoke critical thinking but to persuade the reader of the viewpoint presented. Lastly, the use of "intensification or mitigation" strategies involve intensifying or diminishing the "illocutionary force of an utterance" (Ibid., 51-53).

The study found that headlines employed such elements to "advance the newspapers' diverse ideological and political perspectives," and that they were biased and failed to present political neutrality, enabling the further polarisation of the country. Journalists often used "highly emotive and persuasive words" to convince the reader, empower a specific region, and promote a culture of violence (Ibid., 53). To prevent unethical behaviour and foster objectivity and moderation in Kenyan journalism, the authors encouraged The Communications Commission of Kenya (CCK) and The Media Council of Kenya (MCK) to create a journalism code of ethics and proposed the establishment of a comprehensive legal framework addressing news reporting.

Directions of further inquiry

A study by Cheeseman et al. investigates what Kenyan journalists consider to be their primary role and responsibility within the political life of their nation. They also discuss how the changing political environment might reshape these roles. The study was based on the reading and coding of 210 newspaper articles from two Kenyan newspapers, *The Daily Nation* and *The Standard*, as well as 51 interviews with journalists and civil society activists. The authors analysed the data in the context of "peaceocracy… a wave of 'peace' programming designed to retrain the Kenyan media… that implied that political disputes and controversies should be played down in order to maintain ethnic harmony" (Ibid., 2).

The article found several responsibilities recognised and adhered to by Kenyan journalists, including: Exerting professionalism, facilitating peace, and promoting democratisation. Primarily, the interviewed journalists expressed a priority towards fostering professionalism characterised by political and ethnic neutrality. However, the authors recognised that the "role journalists see as most appropriate in a given context is not set down by a set of abstract principles but depends on the context in which they find themselves." They further state that; "in an ideal world, our interviewees would like to adopt a professional approach, but they live in an imperfect one, and were swayed by the pull of the peace narrative – while recognising its limitations – and then the call to defend democracy, when they felt that political factors outside of their control demanded it" (Ibid., 20). Cheeseman et al. found, therefore, that journalists censored their coverage to prohibit violence and promote peace.

Political and economic structures can also constrain – and thus define – the media's development. By examining how these structures intersect, Ogola (2011) sought to expose key factors that influenced the development of Kenya's media ecology. The goal of the study was to demonstrate "how Kenya's news media are

entangled in a complex power structure, which has enabled but also constrained its development" (Ibid., 77-78, 91). The study adopted a critical political-economy approach and found that even though the private media was found to be vibrant, the sector was not completely independent. For example, after the 2008 post-election violence, "parliament enacted legislation to curb hate speech – legislation that could also be used to criminalise or delegitimise alternative readings of the nation" (Ibid., 90).

In addition, the study finds that the two private Kenyan media houses, *The Nation Media Group* and *The Standard Group*, continue to dominate the sector and influence media development; "the local-language media, previously divided along ethnic lines, began to pitch for national reconciliation, but on terms set up by the state and the mainstream news media" (Ibid., 90). To combat this issue, Ogola emphasises the need for a more competitive media environment free from political influence and patronage. While little specificity is provided as to what exactly a media environment free from political influence and patronage is, Ogola cites greater diversity in media ownership, safeguards to its sustainability, as well as resolution of the threat posed to media freedoms by Kenya's penal code.

In sum, analysis of Kenyan political discourse has focused primarily on public commentary rather than that of political, social, and security sector actors identified as having influence over mobilising groups to violence. While no systematic approach has been taken to the language employed by influential actors, some attempts have been taken to consider the language of influential political and media actors in specific incidents of contestation. Observers identified a political economy of discourse dominated in the English language by two mainstream publications. They also identify the important role of local vernacular and the predominance of local radio as the platform for this discourse. While a number of studies identify the journalistic acknowledgement of principles of constructive discourse, the discretion of journalists to employ such principles was commonly observed to be shaped by the contemporaneous context. A study of the correlation of specific language configurations by influential actors to specific incidences of violence will represent a clarifying addition to the existing literature.

Conclusion

Scholars and practitioners have contributed much to our understanding of the broader macro drivers of violence in fragile settings. They identify how shocks interact with grievances to potentially trigger violence, and how these interactions demand consideration of the multidimensional nature of risk and the potentially self-reinforcing nature of multiple risks that entrap fragile societies (United Nations and World Bank, 2018; Commission on State Fragility, Growth and Development, 2018).

The UN and World Bank's flagship joint study on conflict prevention is premised on 'pathways for peace', based on three core elements of society: Actors with agency to define pathways, institutions that shape actors' incentives, and structural factors informing a society's organisation and overall environment (United Nations and World Bank, 2018: Chapter 3). However, the report, neglects to explore an empirical basis for observing when actors are employing their

agency in a way that increases or decreases the risk of violent conflict onset. Identifying a method for observing the impact (whether intended or not) of actors allows us to then more credibly observe the conditions under which actors are constructive or pernicious.

Our model, using natural language processing to identify the sentiment associated with leaders' language, predicts both increases and decreases in average fatalities for look ahead periods between 50 and 150 days, with overall accuracy approaching 85%. This finding is significant and suggests a significant role for influential actors in determining the positive or negative pathway of a society towards or away from violence. This finding is based solely on the sentiment of the language used by leaders. It is a first indicative step that serves to illuminate a significant unexplored sphere of social science, recently accessible as a consequence of emerging technologies.

We also collected sentiment data about influential actors in Kenya. However, limited resources did not allow for sufficient exploration of its impact on capacity to predict violence. Given additional time and resources we would also like to further explore change in language and sentiment in additional types of online media, including mainstream news.
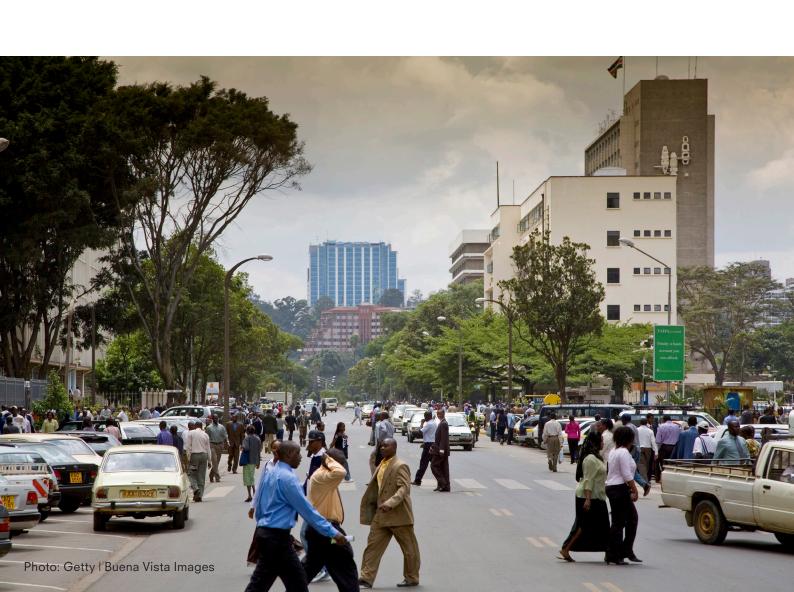
The analysis and findings in this paper indicates a statistically significant relationship between language and future political violence, demanding further inquiry. We hypothesise that larger training data and further testing of other machine learning models, including deep neural networks, could produce even more robust results. Further, our approach only addressed the cumulative body of sentiment among the selected 30 influential actors, rather than the relationship of specific individuals' language to violence. We will use the model to explore the relationship of the sentiment of individual actors' language to the risk of violence.

We further identify scope to explore specific language configurations associated with increased or decreased risk of violence. The data accumulated for this project, and the findings produced by the employed model, open the door to such a line of inquiry that could enable methods or applications for designating specific language as associated with a relatively increased or decreased risk of violence. This line of work might begin with a definition of incitement in very narrow legal terms and attempt to control for every possible/previously demonstrated linguistic, cultural, and context-bound variable.

This method may start with linguistic frameworks informing legal theories of incitement or hate speech (Gordon, 2017), asking: 1) Does it have an association with actual violence as evidenced through the app, and 2) Does this language configuration fit the legal definition of incitement? This task might be approached via the collection of 6100 Twitter speech instances by or about the 30 Kenyan influential actors from January 2012 to December 2017, using AI to test for the language configurations most associated with violent conflict onset. We might then examine specific text excerpts, including speech by single or multiple individuals, with or without references to specific social groups (such as ethnic groups) and organisations (such as private corporations, international organisations, government ministries) and with or without reference to particular political and social issues (such as elections and terrorism). With such data, the representativeness of legal frameworks might be tested.

Social science has retained a disposition towards considering factors external to the agency of influential actors in a given society when identifying risk of

conflict. However, we simultaneously acknowledge that it is actors that determine a society's pathway. Identifying the relationship between influential actors' behaviour and violence constitutes a first step in bridging a knowledge gap in the field, and empowering observers to hold influential actors accountable to an objective metric.

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Appendix: Biographical information of Kenyan influential actors

Robert Alai

Robert Alai is a Kenyan blogger who studied computer technology at the United States International University Africa. He has been involved in moderating websites, organising social events, and promoting citizen social involvement in governance. Alai has also started multiple online companies such as Kazi Africa Limited and My African Career.

Alai was arrested in August 2017, days after he allegedly leaked photos of members from the Kenyatta family in a hospital in Nairobi (Information Cradle, 2017b). More recently, in June 2018, Alai sued Headlink Publishers Limited for running a story painting him as a negative public figure. Alai stated that the article purposely labelled him as a "dishonest person who is involved in corrupt businesses, an extortionist, an unethical and unscrupulous individual who engages in fraudulent, criminal and illegal, and activities" (Omondi, 2018). The publication linked Alai with extortion of senior government officials, private sector managers, and parastatal bosses.

Francis Atwoli

Francis Atwoli is the General Secretary of the Central Organisation of Trade Unions (COTU) and vice President of the International Trade Union Confederation. He has advocated for an all-inclusive government via political reconciliation that he views as essential to enabling foreign direct investment and tourism (Kilonzo, 2014).

He has advocated for the 2005 Bomas constitutional draft, which called for a Prime Ministership and the fair distribution of power. He advocated for every region in Kenya to have a representative in the important departments of the government (Odhiambo, 2018).

Aden Duale

Aden Duale is a Member of Parliament (MP) representing Garissa County and a member of the United Republican Party (URP) of the Jubilee Party. He attended Moi University and the Jomo Kenyatta University of Agriculture and Technology. After his studies, he became a member of the Orange Democratic Movement (ODM) until 2013. He has also served as an MP for the Dujis Constituency. Duale owns several businesses, such as a four-story building named Lillac Centre in Garissa Town, a Nomad Hotel, a firm called Medina Chemicals that supplies veterinary products in Somalia, Djibouti, and South Sudan, and a large cattle ranch in Kenya (Information Cradle, 2018).

As National Assembly Majority Leader, Duale has stated that governors should not be given immunity against prosecution while they are still in office. This statement came after multiple governors requested to be granted immunity (Hajir, 2018b).

Kimani Ichungwa

Kimani Ichungwa is a coalition member of the Jubilee Alliance and a member of The National Alliance (TNA). He worked as a Senior Accountant and Head of Treasury for companies such as Madison Insurance and SafexAfrica.

In 2016, Ichungwa forwarded a petition to Parliament alleging armed militias were formed by governors for political reasons. He stated that people followed him around and that he found a note at his house hinting that people wanted to kill him (Information Cradle, 2017c). In February 2018, suspected robbers allegedly broke into his house and he has also allegedly received death threats (Keya, 2018).

He endorsed William Ruto to become the next Kenyan President by saying, "We are stating clearly that come 2022, we will be behind Ruto and he will be the fifth President of this country. We are with him or nothing and no one will change that" (Hakeenah, 2016).

Dennis Itumbi

Dennis Itumbi is a journalist and blogger who studied at Moi University in Nairobi, Kenya and at the University of Leicester in the United Kingdom. After his studies, Itumbi held key positions in various companies. He was Director of Digital Communication for the Office of the President of the Republic of Kenya, founder of Supreme Media, and co-founder of 25 Studios. He also worked at the Kenya Broadcasting Corporation. He won the Governance, Justice, Law and Order Sector (GJLOS) journalist of the year award for 2006-2007 (Information Cradle, 2013). He is currently enrolled in law school (Sosi, 2018a).

In 2012, Itumbi was arrested and detained for allegedly hacking the International Criminal Court (ICC) prosecution's office email. Itumbi responded by suing the government as he deemed the arrest illegal on the basis that his Constitutional rights were violated. He sought Kenyan Shilling (KSh) 50 million (USD497,135). He also sought to be free "from any further arrest and prosecution in relation to the issues, claiming he is still under close watch by the investigators even after President Kenyatta's case was terminated." In the end, the High Court awarded him KSh5 million (USD49,713) as compensation for his illegal detention and arrest in 2012.

Ali Hassan Joho

Ali Hassan Joho is currently the first Governor of Mombasa County. As a member of ODM and NASA, he is very close to Raila Odinga, the leader of Kenya's opposition party. He is the founder of Prima Pest, Bins Limited, M-Tech Kenya Limited, and East African Terminals Limited. These companies focus on garbage collecting, shipping, and logistics (Tubei, 2017a).

With a net worth of over UDS69,000,000, he is reportedly contributing to Raila Odinga's ODM campaign (howtodoit, 2017). He purchased a majority of the billboards in the country and later "donated" them after expressions of discontent from politicians in other parties (Mwamba, 2017). Joho has proposed to run for Kenya's top-seat for the 2022 elections as the ODM candidate (Arangi, 2018).

Uhuru Kenyatta

Uhuru Kenyatta is the current President of Kenya. He studied at Amherst College in the United States after attending primary school in Kenya. He is the son of Kenya's first President, Mzee Jomo Kenyatta. He is heir to one of the largest land holdings in Kenya. His family also owns Brookside Dairies, which is the largest dairy company in Kenya. They also have stakes in the television station K24 and in the Commercial Bank of Africa (Information Cradle, 2017a).

Kenyatta has a long established career in politics. In 2002 he lost the presidential election against Mwai Kibaki, obtaining 31% of the vote. As a result, he became the leader of the official opposition. During this time, he led his party, the Kenya African National Union (KANU), in advocating against proposed 2005 amendments to Kenya's Constitution. When the 2007 presidential election was approaching, Kenyatta formally withdrew his candidacy, stating he would only run if he was sure he would win the presidential race (Information Cradle, 2017a). Instead, he was re-appointed to the Ministry of Local Government in January 2008 and won the Gatundu South seat. He was also appointed as Deputy Prime Minister, Minister of Trade, and Minister of Finance. In 2013, he ran for the presidential election and won, beating his opponent Raila Odinga.

Maina Kiai

Maina Kiai is a human rights lawyer and activist. After receiving an education from the University of Nairobi and Harvard University, he founded and is the

Executive Director of the (unofficial) Kenya Human Rights Commission. He also served as the Executive Director of the International Council on Human Rights Policy from 2010 until 2011. He is specialised in political reform, anti-corruption, and responses to alleged violence surrounding the 2007 presidential elections (OHCHR, 2018). He also served as the United Nations Special Rapporteur on the Rights to Freedom of Peaceful Assembly and Association (World Movement for Democracy, 2018).

Elite squads were employed to protect Kiai and his family after alleged death threats were brought to the attention of the Commissioner of Police (Pambazuka News, 2008).

Mwangi Kiunjuri

Mwangi Kiunjuri is the Cabinet Secretary of the Ministry of Devolution and National Planning. He graduated from the University of Nairobi with a bachelor's degree in Law. He has held multiple political positions, including Assistant Minister in the Ministry of Water and Irrigation, Minister of Energy, and in the Ministry of Public Works. In 1997, he was elected to Parliament as the MP for Laikipia East where he served uninterrupted for 15 years (Information Cradle, 2018e).

Leaders from the Rift Valley called for Kiunjuric to resign based on alleged involvement in an alleged multi-billion shilling National Cereals and Produce Board scandal surrounding preferential suppliers. (Waithera, 2018).

Henry Kosgey

Henry Kosgey is a member of ODM and studied chemistry at the University of Nairobi, where he obtained a Bachelor of Science. He has held several ministerial positions, including Minister for Transport and Communications, Minister for Tourism, Minister for Education, as well as the position of ODM Chairman.

As a result of this, on 15 December 2010, the Prosecutor of the ICC requested the Pre-Trial Chamber II of the ICC to issue a summons for Kosgey along with William Ruto and Joshua Arap Sang to appear on charges of crimes against humanity relating to conduct surrounding the 2007 election allegedly directed at supporters of the Party of National Unity (PNU). On 23 January 2012, the ICC Pre-Trial Chamber decided that there was not sufficient evidence to confirm the charges of crimes against humanity against Henry Kosgey. However, they confirmed at that time, the charges against William Samoei Ruto and Joshua Arap Sang (Trial International, 2016a).

Moses Kuria

Moses Kuria is an MP for Gatundu South. He became close with former Kenyan President Mwai Kibaki after holding numerous banking jobs. He became involved in politics under the Jubilee Party (Venas News, 2016).

Kuria was once arrested for promoting assassination attempts on former President Raila Odinga and was caught on camera inciting youth. He denied

these accusations on live television (Cherono, 2018; Sudi, 2017). He also candidly admitted to working with Martha Karua (a fellow Kenyan politician) to coach witnesses to testify against DP Ruto at the ICC (Gibendi, 2016).

He explicitly endorsed the recent truce between President Uhuru Kenyatta and Raila Odinga (Raballa, 2018).

Kuria has indicated he will present a bill to ban the export of unprocessed coffee to increase farmer's earnings via value-adding milling and marketing processes the government would support (Gakii and Reuters, 2018).

Samuel Kamau Macharia

Samuel Kamau Macharia is the founder and chairman of one of Africa's largest media outlets, Royal Media Services, which includes Citizens TV, broadcasting via television, radio, and internet. He also owns 11 radio stations broadcasting in both English and local languages (Musau, 2012). Citizens TV reached over one third of all households in Kenya as of 2017. The viewership peaked as high as 62.5% in past years (Ndungu, 2016; Business Today, 2017). After founding his media companies, he became one of the richest men in Africa and won the Lifetime Achievement Award at the EY World Entrepreneur of the Year event in 2015 (Macharia, 2015).

Macharia comes from a poor upbringing, but managed to migrate to Europe and then Seattle where he earned a bachelor's degree in Political Science at Seattle Pacific University and a Master's in Accounting at the University of Washington (The Standard, 2016).

In 2018, the Kenyan government shutdown Citizens TV and other news networks that aired the swearing-in ceremony of the leader of the opposition, Raila Odinga (Ngechu, 2018). However, some observers have suggested he has been generally careful not to mix his business with politics (Africa Intelligence, 2013). That being said, he once revealed to Kenya's senate that "only one of the five presidential elections held between 1992 and 2013 delivered the presidency to the candidate who received the most votes" (Gathara, 2017).

Jackson Mandago

Jackson Mandago is a Kenyan politician and the governor of Uasin Gichu County. He is a member of the United Republican Party and a coalition member of the Jubilee Alliance (Jackson, 2015).

Mandago has been a strong supporter of his party which some observers have associated with selective appointment of party officials to prime county government positions (Information Cradle, 2018g; Komen, 2018). Mandago cites lowering the retirement age to 50 years from 60 years as a potential mechanism to assist in responding to youth unemployment (Ndanyi, 2018).

John Mbadi

John Mbadi is the chairman of ODM and a coalition member of CORD. In December 2017 he was ejected from Parliament by Speaker Justin Muturi after

stating that Kenya has no President. Mbadi said, "there is no President in this country to make appointments. I would rather withdraw from the chambers than withdraw the remark" (Keter, 2017).

Mbadi has expressed support for President Kenyatta's anti-corruption campaign (Amolo, 2018).

Gideon Moi

Gideon Moi is the current senator of Baringo County and the youngest son of Kenya's second President, Daniel Arap Moi. He is also the Chairman of the KANU political party. In 2002 his father retired from politics. Gideon Moi ran for his father's position, winning election and holding office between 2002 and 2007 (Information Cradle, 2018i).

News outlets have reported that Moi announced he will run to become President of Kenya in 2022 with speculation that President Kenyatta will support him over Deputy President Ruto (Shiundu, 2018). Moi refuted these claims asserting that his focus is support for President Kenyatta's Big Four agenda — universal health, industrialisation, housing, and food security (Joseph, 2018).

Musalia Mudavadi

Musalia Mudavadi is the party leader of the Amani National Congress (ANC). His party and FORD-Kenya are significant political powers in Kenya's western region.

Mudavadi is an advocate of devolution of power to county governments and of life sentences for persons convicted of corruption while opposing ODM-backed Constitutional amendments that would allow President Kenyatta to seek re-election in 2022 (Onyango and Otieno, 2018; Sosi, 2018c).

Johnstone Muthama

Johnstone Muthama is a Kenyan business man and politician, belonging to the Wiper Democratic Movement. After graduating from the Gemological Institute of America, he devoted his time to his company, Muthama Gemstone Company. He has been involved in multiple development projects in Kenya. He advocated for MPs to be taxed the same as other Kenyan nationals (Information Cradle, 2017).

Muthama has publicly committed to the Wiper party until Wiper leader, Kalonzo Musyoka becomes President. He has signalled political aspirations including at the gubernatorial level if the Supreme Court accepts a petition for a by-election to be conducted in Machakos (Mueni, 2018a; Mueni, 2018b).

Alfred Mutua

Alfred Mutua is the Governor of Machakos County. He was the first Public Communication Secretary of Kenya. He is a member of the Maendeleo Chap Chap party, which he created, and was endorsed by President Kenyatta (Information Cradle, 2017e). He was a member of the Wiper Party — the party that endorsed him as Governor (Hussein, 2016).

In 2016, the Machakos County Assembly (MCA) motioned to have Mutua impeached on the grounds of alleged violations of the Kenyan Constitution, corruption, and a lack of integrity surrounding an accusation that his government made a fictitious payment of KSh89 million for repairing a dam. (Mbuva, 2016a; Mulwa, 2016a). On the day of the quorum, MCA members' departed to Tanzania breaching the minimum number of members needed to vote for impeachment (Mulwa, 2016b). In August 2018, Mutua was allegedly arrested by detectives from the Ethics and Anti-Corruption Commission (EACC) for corruption, alleging "graft claims of purchase of county vehicles," but Mutua denied these allegations (Mulwa, 2018c).

Josphat Koli Nanok

Josphat Koli Nanok is a member of the ODM as well as the first Governor of Turkana County (Turkana County Government, 2018). He majored in Political Science and History at the University of Nairobi. After graduating he went on to work for Oxfam in Kenya, South Sudan, and Uganda. He has worked as a consultant for the United Nations World Food Programme (UNWFP) in Kenya, Eritrea, and South Sudan.

As the Chairman for the Council of Governor's (COG), Nanok demanded that governors be awarded immunity after the arrest of Busia Governor Sospeter Ojaamong, soliciting criticism from MPs (Murimi, 2018). Nanok has publicly criticised budgetary cuts to the Judiciary DP Ruto (Wanjala, 2018c).

Charity Ngilu

Charity Ngilu is the governor of Kitui under the Jubilee Party. Ngilu was originally a member of the now defunct National Rainbow Coalition (NARC), which later merged with various other parties to form the Jubilee Party. She was first elected to Parliament in 1992 and became the leader of the Social Democratic Party. She made history in 1997 as the first woman to run for president in Kenya's history. Although she lost the election, she was able to retain her Parliamentary seat. She supported ODM's Raila Odinga in the 2013 presidential elections after supporting him in the previous election. In that same year, she signed a coalition agreement involving multiple political parties before opting to join the Jubilee Alliance (Information Cradle, 2018c).

Ngilu was one of the names on the Law Society of Kenya's blacklist, a document identifying public officials and their links to issues ranging from corruption to economic crimes. In 2013, the Kenyan Parliament questioned her process of appointing Ministry personnel as Cabinet Secretary for Land, Housing and Urban Development (Musili, 2018).

In January 2018, Ngilu banned charcoal trading in Kitui, because logging for charcoal severely hurts the environment and ecosystems. In June 2018 she appeared in court for charges regarding obstruction of investigations into the irregular allocation of land. (Information Cradle, 2018c).

David Nkedianye

David Nkedianye is a member of ODM. In October 2017, he withdrew his petition challenging Governor Joseph Ole Lenku's win after a 13 hour meeting with Kajiado elders and political leaders. Days later he joined the Jubilee Party and has since pledged support to President Kenyatta (Siele, 2017; Presidential Strategic Communications Unit, 2017).

Cyprian Nyakundi

Cyprian Nyakundi is a Kenyan blogger and attended the Meru University of Science and Technology. He was expelled in 2012 for "Tarnishing the Image of the University" through social media: He wrote that the road to Nchiru town be improved and complained about the unavailability and inadequate number of books available at the library (Information Cradle, 2018h).

Nyakundi has been charged multiple times in the Nairobi and Kiambu counties. Some of these charges include, "posting online derogatory remarks against Kirinyaga Governor Anne Waiguru, Nairobi's Mike Sonko and Kenya Power Managing Director, Ken Tarus. Nyakundi was also charged with posting hate speech against the Kikuyu community on social media." He denied all these accusations and was freed on bond (Bocha, 2018). At the end of July 2018, Twitter decided to suspend his account as a result of alleged violation of Twitter's rules. (Business Today, 2018).

Raila Odinga

Raila Odinga served as the Prime Minister of Kenya from 2008 to 2013 and is the son of the first Vice President of Kenya, Jaramogi Odinga Odinga (under the presidency of Jomo Kenyatta). As a result of him being the leader of ODM and NASA, he is the leader of the official Kenyan opposition. NASA MPs have been rallying support for Odinga's presidency in 2022, although he has expressed no interest in running (Otieno, 2018; Maosa, 2018).

Odinga lost to President Uhuru Kenyatta in the 2013 Kenyan presidential election and contestated the results of the 2017 election. To allay speculation regarding antagonism between Kenyatta and Odinga, the two shook hands in a televised joint press conference, referring to each other as brothers. They formulated a nine-point agenda to "deal with issues touching on devolution, inclusivity, poverty, divisive elections, unemployment, and historical injustices" (Wanjala, 2018b).

Babu Owina

Babu Owino is MP of Embakasi East constituency. Owino has stated that he will run for Nairobi Governor in 2022 and for the presidency in 2027 (Ngina, 2018). He studied at the University of Nairobi.

After his studies, he ran for MP for the Westlands constituency in 2017 losing to Hon Timothy Wanyonyi (Information Cradle, 2017d). He later ran for MP of the Embakasi East constituency, initially winning the election, before the High Court

overturned his victory as a result of "widespread errors." In June 2018, Kenya's Appeals Court overturned the High Court's decision to re-award Owino the seat (Ndonga, 2018). Recently, Owino has also been a victim of alleged death threats (Sosi, 2018b).

Isaac Ruto

Isaac Ruto is the former Governor of Bomet and leader of the lesser known Chama Cha Mashinani party. He was previously a member of the United Republican Party. He has held many positions in politics, including the Chairman of the Council of Governors in which he facilitated cooperation between national and local governments, as well as cooperation amongst local governments. As an MP, he was a member of the Select Committee on Constitutional Review, overseeing the creation of a Constitution that heavily supported devolved governance (Information Cradle, 2018d).

In the 1980s he became an activist, opposing the views of then President, Daniel Arap Moi (Ibid.). He was arrested in 1982 for an attempted coup as a student at the University of Nairobi, along with future opposition leader, Raila Odinga (Barasa, 2008; Mayaka and Sigei, 2013). Isaac Ruto also faced motions for impeachment by 40 MPs (Bryant, 2010; Daily Nation, 2013).

William Ruto

William Ruto is the current Deputy President (DP) of Kenya. He studied at the University of Nairobi where he graduated with a PhD. After finishing his studies, he began his political career with Youth for KANU '92. It was formed to campaign for President Moi's election under the KANU party in the first multiparty election. KANU and Moi won, which saw Ruto appointed as Assistant Minister for Provincial Administration, and later, Minister of Home Affairs.

In 2002, Ruto supported President Moi's backing of Uhuru Kenyatta's bid as flag-bearer in the year's general election. In the election, KANU lost to the opposition party, led by Mwai Kibaki. In 2005, he joined Raila Odinga in the ODM party. He then ran to become ODM's candidate in the 2007 presidential election, however, he lost the nomination to Odinga. He was later appointed as Minister for Agriculture and then moved to the Ministry of Higher Education Science and Technology.

Ruto was the chairman and a member of the Parliamentary Select Committee on the Constitution that produced the 2010 Constitution. In the 2013 presidential race, Ruto ran as Kenyatta's running mate under the Jubilee Alliance, which he now belongs to. Kenyatta won the presidential race in 2013, making Ruto Kenya's Deputy President (Information Kenya, 2018a).

Ruto has stated multiple times that he plans to run for president of Kenya in 2022. He has also stated that President Kenyatta will support his campaign come 2022 (Gitau, 2018).

Joshua Arap Sang

After graduating from the Kenya Institute of Mass Communication in 2006, Joshua Arap Sang became a radio broadcaster at the Kenyan radio station KASS FM. He is the host of a call-in program, Lene Emet — or "How is the Country." Arap Sang is commonly cited as a prominent ODM supporter.

In December 2010, the Prosecutor of the ICC requested summonses to be issued for Ruto, Kosgey, and Arap Sang, citing "reasonable grounds to believe that they were individually criminally responsible for murder, torture, deportation or forcible transfer and persecution on political grounds, as crimes against humanity" surrounding the 2007 Kenyan election. In January 2012, the ICC Pre-Trial Chamber confirmed the charges against Arap Sang and set the dates for his trial. After pleading not guilty to all the charges brought against him, Sang submitted a request to dismiss the charges and enter a judgment of acquittal. In April 2016, the Trial Chamber announced it was terminating the case, concluding that the charges be vacated and the accused be discharged as the prosecution did not present sufficient evidence to convict the accused (Trial International, 2016b).

Eugene Wamalwa

Eugene Wamalwa is Kenya's Cabinet Secretary for Devolution and Arid and Semi-Arid Lands. He is the former Minister of Justice, National Cohesion and Constitutional Affairs and a member of the New Forum for the Restoration of Democracy–Kenya (FORD-Kenya) Party under the Jubilee Party. He has a bachelor's degree in Law from the University of Nairobi and a diploma from the Kenya School of Law (Information Cradle, 2018b).

Wamalwa, along with 12 other MPs from the FORD-Kenya Party, left the party to create the New FORD-Kenya Party (one of the 12 political parties belonging to the Jubilee Party) after Wamalwa lost a 2003 party leadership contest to Moses Wetang'ula, Senator of Bungoma. Similar to the recent handshake between Raila Odinga and Uhuru Kenyatta, the two shook hands in 2018 (Wanjala, 2018a).

Wycliffe Wangamati

Wycliffe Wangamati is a member of the Forum for the Restoration of Democracy-Kenya Party (FORD-Kenya) and is the current Bongoma Governor. He has advocated for water and education standards as well as strong approaches to corruption (Nalianya, 2018).

Wangamati has implemented county cost-cutting, particularly in relation to county employee meetings, in order to finance student allowances and scholarships as well as salaries for early childhood development (ECD) teachers and doctors (Wanjala 2018b).

Agnes Zani

Agnes Zani is a Senator for Kwale for ODM. She received her Bachelor of Arts and Master of Arts from the University of Nairobi, before attending Oxford University where she obtained her PhD in Sociology. After graduating, she returned to Kenya and became a lecturer at the University of Nairobi in 2008. She worked for the University until her Senate nomination in 2013. Throughout this time, and before becoming a senator, she was involved in community projects and raising awareness about gender issues.

In 2014 she competed for the ODM Secretary General post against Ababu Namwamba and became Namwamba's interim deputy. After Namwamba resigned and abandoned ODM to create the Third Force Alliance, Zani became the party's Secretary General and was nominated to the Kenyan Senate (Mureithi, 2016). As the senator for Kwale, she has advocated for development focused on marginalized groups, particularly women.

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Chris Mahony provides his personal view in his capacity as a Research Fellow. The views in this paper in no way reflect, implicitly or explicitly, the views of the World Bank Group.

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