Battles Over Perceptions Among Violent Non-state Actors

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There is a growing consensus in the political violence literature that competition between violent non-state actors contributes to longer conflicts and more dramatic forms of violence. However, violence, as a solitary tactic, is too blunt of an instrument for political groups, to effectively compete with rivals and mobilize support. Instead violence, without additional context, leads to a series of ambiguities, which undermine a group's short and long term goals. I detail how messaging allows groups to clarify the innate ambiguities of violence, and helps mobilize resources. To identify evidence for the proposed mechanism I first develop a typology of the strategies used by these actors, then use a machine learning model to extract these occurrence from their statements. By moving beyond bag-of-words based representations and leveraging additional tools from natural language processing I am able to show significant variation in group communication, both in the strategies employed and the aspects discussed. I observe that groups devote considerable attention both to promoting their broader political agenda, and to undermining the goals and actions of their rivals.

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1.1 The Puzzle of Rebel Media and Their Messages

A growing literature[1] has made the case that competition between violent non-state actors can have significant impact on broader conflict dynamics. For one, competition may lead to "outbidding" dynamics, where groups increase the quantity or severity of terror attacks, to overtake rivals [15, 28], or lead rebel groups to engage in increased civilian victimization [150]. More generally, competitive relationships between violent non-state groups may spur innovation and lead groups to endure longer [117], while making conflict recurrence more likely [154]. This conceptual and broad empirical research mirrors recent real world conditions, as competition between ISIS and al-Qaeda has been identified as a contributing factor to increased violence in Syria, as well as the attack on civilians at the Radisson Blu hotel in Bamako, Mali, which resulted in 20 deaths.[2] Similarly, competition between Palestinian groups Hamas and Fatah is thought to have led to a proliferation of suicide attacks [15], and in part, to the failure of the Oslo peace process [82]. In Burundi, rebel infighting escalated civilian killings, while leading to widespread displacement and sexual abuse of the civilian population.[3] These consequences reinforce why studying rivalries between non-state actors is important, since they appear to generate violence, abuses, and destruction around the world. When attempting to understand the drivers of competitive dynamics scholars have tended to focus on material interests such as capturing market share [105] or the desire to control natural resources [41, 150].[4]

However, the existing research leaves two important sets of nested gaps. The first is where do the material resources, so crucial for group competition, come from? Acquiring the resources needed to compete with rivals necessarily requires a group to be able to mobilize resources. This might be from state or domestic funders, or from persuading individuals

[1] Pitt's ETD requirements have led the document's formatting to be suboptimal, please contact the author for an updated version.

[2] https://www.foreignaffairs.com/articles/2015-11-23/isis-and-al-qaeda-race-bottom

[3] https://www.hrw.org/report/2003/12/21/everyday-victims/civilians-burundian-war

[4] [118] is a notable exception, as he aims to assess the broad correlations of rivalries. Importantly, he finds rivalries are associated not only with material interests but also ethnic motivations.

to join their group. While some might assume that increased violence itself might generate more resources for violence, this bandwagoning perspective cannot explain why rebel groups would form against a stronger, repressive state in the first place, or why violent groups might attempt to moderate the interpretation of their violence by highlighting the more extreme violence of other competitors, including the state. Second, because violence has been assumed to be the primary means of competition and mobilization, researchers have often ignored many of the other public signals composed by violent groups. If groups mobilize resources, not only by engaging in violence, but by attaching political meaning to these actions, and promoting their broader goals, then by ignoring these messages our understanding of competition is incomplete

These gaps have led past explanations to fall short of explaining the observed actions of violent non-state groups. Groups not only engage competitors by direct conflict or by escalating violence, but are also compelled, by the same competitive dynamics to also invest their scarce resources into complex political messaging operations. Further, these messages aiming to mobilize support often contain nuanced messages, distinct from the "death to America" bluster featured in popular media. These massage also target a variety of audiences, not only to gain support, but to demobilize potential opposition, including from the international community. An important example of the latter occurs in 2003. At this time the War on Terror was in full swing with US and coalition forces involved in direct conflict in Iraq and Afghanistan, while financial and military support was being provided to aid dozens of countries in their fight against terror. While Hamas had not been included in the broader War on Terror, there were previous discussion within the Bush administration to extend the conflict to include the group [130]. Israel, Hamas's chief enemy, seeking to place Hamas in US cross-hairs, claimed that the US;s failure to include Hamas on their terror list was leading the group to engage in additional attacks [111]. Similar efforts saw Israel claim that Hamas had joined forces with bin Laden's terror network [123], and thus were a direct theat to the West. This narrative was reinforced by Fatah, Hamas's domestic rival, who again aimed to link Hamas with al-Qaeda by claimed that Hamas had allowed international terrorists into Gaza [79]. For Israel and Fatah linking Hamas to al-Qaeda would damage the reputation of the group, while potentially solidifying support for themselves. For Hamas, however the

stakes were potentially much higher. If Hamas was perceived as being allied with, or having similar aims as al-Qaeda, this might lead to international mobilization against the group. Hamas leadership, seemingly aware of these risks, responded to Israel's claims by issuing a statement saying that the struggle of Hamas and al-Qaeda are different and that "Israel wins if she makes links between the two issues" [123]. Hamas similarly responded to Fatah's claim by releasing a statement that distanced themselves from al-Qaeda and claimed that Fatah made the statement to sway international opinion in favor of international forces deploying to Gaza [79]. This would be one of many statements released by the group in the years after 9/11, where they attempted to demarcate their group and al-Qaeda. Hamas has further made appeals to the West that they are actually the moderate group in Gaza, and if they were removed more radical groups would take their place [99]. While the direct effect these statements had on deterring US action is difficult to assess, there very existence raises several points. The first, is that Hamas was concerned enough to release several statements which aimed to counter arguments made against them. In particular, making appeals that their organization was not a threat to the West. Second, the fact that these statements were released publicly, suggests at least some attempt to influence not only US decision makers, but to send a message to the broader international community. Finally, we observe Hamas both laying out the goals of their own organization, while also denigrating the motivations of competitors such as Israel and Fatah. That is, rather than the messaging of Hamas being independent of that of their competitors, it directly responds to it.

This strategic use of media operations is far from a Hamas specific occurrence. During the Algerian civil war, The Armed Islamic Group (GIA) would frequently claim that their competitor the Islamic Salvation Army (AIS) were traitors because they were willing to cooperate with the Algerian government. This lead to frequent threats against AIS leadership and even including them on a publicly released "hit list." The AIS in turn would condemn the GIA's use of violence against the civilian population, distance themselves from the group, and issue their own threats. According to the Rebel Governance Dataset (RGD) around two-thirds of the civil wars occurring between 1950 and 2006 featured at least one rebel group which managed their own communication outlets [58]. [138] similarly find that for terrorist groups roughly 40% of the group-year observations feature a group with ownership

of a TV or radio channel. The use of digital messaging has also become more widespread over time with the rise of information communication technology (ICT). According to The Institute for Homeland Security (2019), in 1998 there were only 12 terrorist-related websites, while there were 6940 by January 2009. Aside from the frequency of use by violent groups, these operations are both extensive and expensive. For example, Hezbollah operates over fifty websites, while their international TV station has a yearly budget of around 15 million dollars [22].

The widespread adoption of media usage, as well as the potential costs placed on groups without media capabilities raises several puzzles. First, if it is violence that matter for groups to achieve their goals, not messages, why do so many groups engage in messaging alongside violence? Second, why do we observe such diversity in the aspects being discussed and positions taken, rather than a pooling of messages we might expect from cheap talk. Third, why, contrary to expectation of the outbidding literature, do groups not always try to one-up competitors by taking a more extreme position, but often condemn extremist actions and positions of rivals, and make the case for their own relative moderation?

1.2 The Battle Over Perceptions

I theorize that we observe media usage from violent non-state groups, because groups cannot compete on the battlefield without first mobilizing resources for their cause. As this mobilization involves not only shows of strength, but also winning hearts and minds, this leads to additional battles over perceptions. These battles over perceptions expand the arena of conflict to the airwaves, cyberspace, and across traditional media outlets. In these arenas groups compete not only by carrying out more attacks, but by attempting to define themselves (and denigrate their competitors) to domestic and international audiences. The use of media operations provides unique opportunity for groups to create and manage their group's perception, and crucially to differentiate their organization from rivals. When we focus on the difficult and competitive process of mobilization (and demobilization) of resources, how groups are perceived becomes a critical factor in a groups endurance and success. By conceptualizing violent groups as political actors in search of scarce societal resources, violence and messaging are no longer competing but complementary strategies

deployed by groups to further their goals. Messaging then helps groups overcome some of the inherent ambiguities of engaging in violence to further political goals. For instance, without the ability to signal the perpetrators of an act of violence, or to lay out the underlying motivation for the act, it is unclear how a group could receive even short term benefits, let alone pursue their long term organizational goals.[5] As we detail later. simply having a messaging apparatus, might not provide mobilization benefits, if it sends contradictory signals, or is unable to adapt to relevant events. While a related literate on alliance formation in civil wars, [21] argues explicitly that it is power considerations, not identity that drives alliances. [21] does acknowledge that "... while identity factors do not determine alliance choices, the fact that leaders feel compelled to justify their choices in these terms implies identity narratives are useful for public consumption (p.7)." By observing that groups not only engage in messaging, but in the crafting of complex messages to promote their group, and attack the reputation of their rivals, presents evidence that messaging are not merely window-dressing, but a key component in the competition between violent non-state actors. While the pen (or the tweet) are not as mighty as the weapons of modern war in and of themselves, they can be used to mobilize support for their use.

1.2.1 Group Perceptions and Support

The mobilization of support is necessary for all political actors both violent and non-violent. The incentives for political actors to attract support and cultivate positive perceptions has been well studied in the American and Comparative politics subfields of political science. For example, in order to win elections candidates in the US need supporters to fund their campaign, to promote their cause among the broader population, and crucially, to cast ballots for them. Even in autocratic countries that either do not hold elections, or hold elections that are not free and fair, leaders still may have a "winning colation" of political leaders or party elites who's support they need to secure in order to maintain power [33].

As violent non-state groups are also political actors, they need support to endure and achieve their goals. For violent non-state groups their are two broad groups of supporters

[5] An important assumption is then that the groups themselves have a centralized media operation that can be controlled.

civilians, both international and domestic, and the international community, including both state actors, and NGOs.[6] Similar to party candidates, non-state groups also aim to gain domestic support. This includes support from civilian non-combatants.[7] At the most basic level individuals within the state are potential recruits for a movement and can provide income through voluntary contributions or involuntary taxes [74, 61]. However, civilians also play more complex strategic roles for violent actors. In particular, civilians can provide information about state activities to rebel groups and allow them to hide among the general population [74, 151]. As these resources can instead be given to the state or a competing group [92], securing civilian support can be an existential issue for groups.

However, while support is crucial for the survival of organizations, this support is not allocated randomly. Rather, past work has noted that individuals choice to support political movements both due to the closeness of an actors policies and their own, as well as their broader perceptions of the group. In traditional politics, namely elections in democratic systems, a broad literature on "spatial voting" has theorized about how individuals evaluate and choose who to support. In the model laid out by [34], he assumes that citizens compare the closeness of the ideology (assumed to be unidimensional) of a given candidate to their own ideology, with voters favoring candidates who's ideals points are closer to their own. Building on these insights addition work has found that economic conditions at the time of the election have a large impact of voting decisions [107, 87]. Second, individuals are not only motivated by the objective economic conditions or candidate positions, but also by their *perceptions* of these aspects. Differences in perceptions allows for individuals to evaluate the same objective economic conditions in vastly different ways [35] or for negative descriptions of a candidate to lead individuals to make more negative evaluations of candidates [142]. Because perceptions do not always align with the objective on-the-ground conditions, parties

[6]In fact the comparison between political parties and violent non-state groups is compatible given that highly studied groups like Hamas and Hezbollah are both violent non-state groups and political parties. Similarly, former rebel groups such as the FLN in Algeria and ZANU-PF in Zimbabwe went on to control these states for decades.

[7]This is not to say that difference funding source have the same impact of group actions. Existing evidence suggests that support from external supporters, and natural resources may decrease a group's reliance on domestic support leading to more violence [145, 125]. Similarly, this effect may vary across group type and effect other group responses [137]. The broader point of this section is simply to highlight that support more generally is crucial for non-state groups.

and candidates have a need to focus perception in directions that benefit them. This can be done thorough the use of emotive language to increase mobilization of supporters [29], or to demobilize opposition. Parties may also select the types of content that they promote. This may involve altering the attention to various economic issues [147].

For violent groups participation has been theorized to be a function of cost-benefit analysis among individuals. These benefits might include private benefits (those paid to the individual) [88, 27] or public goods (those provided to their group) [109]. Similar to citizens in democracies, individuals may also evaluate the goals and ideology of a violent organization before choosing to support them.[8] [62]'s survey of former combatants in Sierra Leone's civil war finds that 70% of former Civil Defense Forces (CDF) members joined because they supported the political goals of the organization. Thus what groups claim to stand for appears to provide important markers that potential supports can evaluate when deciding to support the group. However, again perceptions also come into play. [60] find that the public perception of violent political groups impacts their overall level of support. This is further supported by work assessing the motivations of individuals joining rebel movements. Further, non-material consideration may also influence individuals likelihood of supporting a given groups.[149] finds that individuals in El Salvador were motivated by moral considerations. Again violent groups are also proactive in aiming to shape the perception of their group. This notion of shaping perceptions is at the core of the growing literature on violent groups quest for international legitimacy. Actions such as providing social services [58, 134] and engaging in democratic selection of their leaders [30] are thought to signal to the international community that a group is not just a violent actor, but that they have some legitimacy in their operations. Engaging in acts of public diplomacy further increase publicity for groups, while weakening the state's claim to being the sole holder of legitimacy [24]. Similarly, [59] suggests diplomacy allows groups to make the case that they are more than just a violent organization, and that they have the willingness and capability to cooperate with international actors. Crucially, it is not just what groups do, but how these actions influence other actors perceptions of the group.

[8]Important differences remain as both the cost of participation and the cost of non-participation are considerably higher during civil conflicts [75].

1.2.2 The Ambiguities of Violence

However, violent groups face a special challenge when aiming to shape public perceptions of their group in order to mobilize support, because their primary tactic, violence, is inherently coarse, relative to the tools available in electoral politics. For one, legislation typically has public sponsors and co-sponsors, linking actors to actions. Additionally, since votes are cast in favor or in opposition to a given policy, a politician's political positions are more easily inferred by potential supporters. It is unclear that violence, by itself, consistently provides this information. However, much of the previous work has focused on the relative credibility of violence vs. speech. The claiming is that violence credibly communicates a group's aims, as they are costly signals of a group's commitment and of their ability to impose costs on advisories, while speech is simply cheap talk [83]. [83] illustrate this point by suggesting that had al-Qaeda simply threatened to carry out the September 11 attacks against the US, it is unlikely that the US would have taken this at face value and met the group's demands. However, while violence may be a more credible signal than words alone, the coarseness of violence, when used as a standalone tactic, still suffers from a series of ambiguities, which undermine the previously theorized mobilization benefits of engaging in the tactic. These ambiguities and how they can undermine the mobilization potential of engaging in violence are detailed in the following sections.

1.2.2.1 Unclear Perpetrator The first ambiguity when violence is used as a solitary tactic is that the perpetrator of these acts are not obvious from the act itself. If, as often proposed, groups want to receive credit for the violence they carry out, to gain instrumental benefits of using violence, it is unclear how these benefits are conferred if the perpetrator is unknown. In fact, being able to attribute an actor with an act of violence is a necessary, if implicit, assumption that previous theoretical work on competitive mechanisms relies on. One example, is the finding by [28], that groups compete with one another not just by carrying out more violence, but by engaging in more shocking forms of violence to differentiate their group from it's rivals. However, it is unclear how violence could help to differentiate one group from another without a publicly attributed perpetrator.[9] In fact in these competitive

[9]This notion is supported by [77] who finds that competition between violent groups leads to an increase in the likelihood of groups claiming credit for their attacks, although [2] find inconsistent evidence of the

situations where attribution is theoretically most necessary, the presence of multiple groups also makes the perpetrator of a given act harder to distinguish.[10] This creates a need to demonstrate that a given action was carried out and sanctioned by a given organization, to ensure they and not their competitor receives credit. For a more general example, imagine that the well known Pepsi Challenge adverting campaign, lacked attribution to Pepsi Co. and was instead the "Some Cola Challenge." The campaign would have essentially been pointless and would not have allowed Pepsi to capture additional market share, or to drive competitor Coke into the disastrous launch of New Coke.[11] While there may be strategic reasons to claim credit for only some actions [54, 53, 2], not being able to link your group to any of the actions you carry out severely limits any organizational benefits of carrying out the actions in the first place. In addition, given that some actions may damage a group's reputation, they also want to be able to distance themselves from actions taken by rival organizations. Thus there is a need not only to assign their groups as the perpetrator of an action, but to clarify that they are not responsible for other actions.

1.2.2.2 Unclear Actions A related ambiguity is that while the potential perpetrators might be well known, the wide variety of actions undertaken by a given group may be unclear. While unclear perpetrators can be thought of as, given an action occurred, who did it? Unclear actions can be thought of as, given an actor, what are all the things they did? This ambiguity is important given that we know the public is often unaware of the variety of actions taken by political actors even in open and information rich environments like the Untied States [47]. A lack of information on the variety of actions taken by violent groups creates the potential information environment, where all individuals know about a group are coarse representations, such as "violent" or "terrorsit", without an understanding of the larger portfolio of actions groups may undertake. This lack of clarify is particularly limiting for groups that carry out violence but also other actions which might build legitimacy. For

effect.

[10] If only a single actor exists in a environment it might be assumed that the only violent group carried out the attack. However, even in these scenarios being able to clarify if a group carried about an attack should still be useful as the state could carry out acts of violence and blame it on the violent group, while the group would likely prefer to receive credit for their actions, rather than them be attributed to random or criminal violence.

[11] https://www.history.com/news/cola-wars-pepsi-new-coke-failure

instance groups often provide social services [134], hold elections [30], and control territory [74, 136, 135]. Again, a lack of clarity about the variety of actions groups carry out can be limiting for groups that aim to appeal to a broad set of potential supporters. While some supporters may be attracted to a group's use of violence, potential external state sponsors may want groups to demonstrate that they also carry out actions which signal legitimacy. Without being able to signal to multiple audiences the variety of actions a group engages in, it would be more difficult to mobilize resources from these variety of sources. Further without information about the variety of actions taken by a group, to outside audiences may see all violent groups as interchangeable.

1.2.2.3 Unclear Goals An additional ambiguity is that an act of violence does not always allow an individual to infer an organization's motivations [56]. Even attacks on clearly symbolic targets may have numerous potential motivations behind them that are unclear without additional information. For example an attack on a religious institution is clearly political, yet, is the goal to intimidate member within the attackers community because their practices are too strike/moderate? Or is the attack from another religious group to maintain their dominance? Or might the attack actually be targeting the ethnic group which communes at that location? If, as generally believed, that rebel and terrorist organizations have larger political goals, then not only the act of violence, but the intention of a given act is important. This ambiguity of goals is also important in light of existing work finding that individuals actually assume that groups that use extreme violence are themselves interested in only extremism, rather than other political goals [1]. Thus without a means of communicating the intention of the violence, these acts can actually undermine a group's aims. Further, it seems unlikely that groups could overcome the inherent delegitimizing effects of violence, if they were unable to communicate to the public why they engaged in an attack [128]. At the extreme end groups might be regarded as simply bloodthirsty murders, a brand that has a rather narrow support base. This was he case for the MNLA who were viewed internationally as criminals, committing theft, and rape, with connections to terror groups [66]. This in turn harmed their international reputation and chance for external assistance [17]. The cost for groups then is losing out on potential supporters that may be in favor of their goals, even if they do not necessarily approve of their means.

1.2.2.4 Unclear Competence

A final ambiguity of violence is that it does not clearly signal a group's competence. By competence I mean the alignment of a group's actions and their expressed goals. For instance, groups often claim to represent an ethnic or religious group, but also frequently engage in violence against these same groups. This creates an incoherence that can not be remedied by simply using more violence. Without a justification for group behavior, and an effort to form a connection between actions and messages, groups may seem unorganized, and in the worst case be deemed as criminal rather than political actors. [98] points out that as the dissonance between the facts on the ground and the image projected through a group's media becomes larger, it becomes more difficult for a group to maintain morale and to recruit new members. A well known example of these difficulties occurred as ISIS begun to lose its territorial control, and thus needed to find additional strategies to reconcile their actions with the new state of the group [64]. Thus violence, can actually make groups look disorganized or insincere, when they are unable to link it to their goals. The was the case for Pakistani Taliban groups such as Tehrik-e-Taliban Pakistan (TTP) who lacked a strategy to justify the causes of their violence. Their later attempts to make religious based appeals were undermined by their lack of political vision, along with seemingly senseless civilian victimization [39].

1.2.3 Mobilizing and Competing Through Messaging

These limitations of violence, as a standalone tactic, can be partially ameliorated through the use of an effective political messaging operation. The use of media can help to boost possible benefits of violence, such as receiving credit for the actions groups carry out. Perhaps more importantly, they can help groups minimize the costs associated with using violence, by providing a means of distancing themselves from some actions, while providing an outlet to explain why their group engaged in other acts of violence. Crucially, in situations were there are more than one group competing for the same resources, messaging is useful for organizations to make the case that their movement, not a rival's, is worthy of support. While actors will evaluate the actual actions groups have taken, without 1.) knowing about these actions 2.) knowing why a group carried them out 3.) seeing coherence in the variety of actions carried out, the potential to mobilize support is minimized. Imagine participating

in the 2020 Democratic primary in the United States, but instead of being bombarded by Mike Bloomberg ads on Hulu, the candidates all decided not to campaign or message. If none of the candidates released ads or statements explaining their goals for the future, or contextualizing previous votes, without closely studying the votes or legislation written by the candidates, individuals would have considerably less information about their given positions. More problematic for candidates is that this would lead individuals to ignore their campaign entirely or to create their own explanations for past votes, and interpolate a candidate's future positions from their limited information on their past record. The likely outcome here is that individuals that are positionally closer to a given candidate would not support them, either because they did not know their positions, or because they decided to abstain from the process entirely. In the context of violent political conflict messaging provides an even more important role, given that the information environment is less rich.

1.2.3.1 Evidence of the Importance of Messages Before laying out the variety of ways that media operations help overcome the ambiguities of violence and thus aid in group's mobilization of resources, it is worth providing evidence that the actors with the most at stake, violent actors and the states they challenge, each testify to the importance of messaging.[12] On the group side, leaders frequently emphasize the importance of a coherent media strategy. For example, Hamas's communication chief describes media outreach as "the decisive weapon", while Hamas's charter is explicit about the importance of maintaining the support of educators and media personal, in order to convince the broader public to support their cause [86]. Al-Shabaab, a Somali violent political group, also realized that having an effective media apparatus would allow them to communicate their message to both domestic and international audiences, including al-Qaeda [8]. Similarly, Hezbollah is aware that Israeli political and military leaders watch their TV station al-Manar, as well as cover it through print and news programs, allowing them indirect influence on the Israeli public [71]. The former editor of the PIRA's newspaper *An Phoblacht/Republican News* noted that due to English censorship, the magazine was among the only sources detailing the conflict from a Republican point of view [52]. While individuals may be skeptical of content created by vi-

[12]This is in addition to the behavioral evidence of the importance of messaging, that groups spend considerable sums on them, and that they are employed widely.

olent political groups, highly effective news operations such as Hezbollah's al-Manar, which is watched widely across the Middle East, provides an outlet for the group, even among individuals who are not necessarily active Hezbollah supporters. This increased attention generated from their media relations allows groups to reach out to potential supporters, allowing for new inflows of income and recruits. Similarly, the PIRA published several magazines such as *The Irish People* and *The American Gael* that promoted the republican cause specifically for the American market [22]. This buoyed PIRA support in the US and helped them maintain significant financial support from the Irish diaspora in America. A factual report on the PIRA compiled by the British government states that while they were able to counter PIRA claims within the UK, that misrepresentations from the group were more likely to persist internationally.[13] To ensure that they dominate the political discussion in areas under their control, the Syrian group Hay'at Tahrir Al-Sham regularly defaced billboards promoting competitor Hizb ut-Tahrir, even banning printers from working with the group [148].

On the government side, relevant actors are also clear that winning the messaging war is particularly important. Col. David Kilcullen notes that counter-terrorism is "now fundamentally an information fight" [72]. He goes on to say that attacks on US forces in Iraq are significant not just because of the impact they have on reducing force size, but because of the attention that a terrorist group can generate by showing dramatic images of a burning Humvee. He also notes the role media operations play in elevating groups like al-Qaeda to the global scale, stating that "if bin Laden didn't have access to global media, satellite communications and the Internet, he'd just be a cranky guy in a cave"[72]. The US government more generally, is also actively concerned with the role social media plays for violent political groups. The US State Department's Country Report on Terrorism notes that "The recruitment of violent extremists through social media remained central to ISIS's terrorist campaign..."[14] They similarly point out the lasting influence of these media operations, as the attack on the Pulse nightclub in Orlando, Florida in 2016 was inspired by videos of speeches made by Anwar al-Awlaki, who was killed in 2011. Additionally, in testimony

[13]Ronald Reagan Library (David Hannay to John Poindexter 3-25-1985)
[14]https://www.state.gov/j/ct/rls/crt/2016/272228.htm

before the House Homeland Security Committee, the former director of the FBI, Christopher Wray, said that a particular concern for the FBI was individuals who were inspired by propaganda before conducting attacks, or individuals who made contact with terrorist organizations after viewing propaganda.[15] The fight against propaganda from violent groups is also being taken seriously at the international level. During 2018 Europol conducted a series of operations against terrorist group's online capabilities, which included seizing servers and shutting down sites associated with ISIS's al-Bayan news agency.[16]

1.2.3.2 Clarifying the Ambiguities (Clarifying Perpetrator) As noted previously, a potential limitation of violence is that the benefits of using this tactic, (publicity, demonstrating capability etc.) are only conferred if it is public knowledge that your organization is responsible. An effective media operation helps solve this problem, by providing an outlet for groups to claim credit for their actions. To successfully convince outsiders of their group's responsibility for a given action groups often provide details about the attack. Hamas's military wing, the al-Qassam Brigades, includes a separate section of their website dedicated to official statements issued by the group. These statements are often used to claim credit for attacks on Israel. Each statement is titled Military Communiqué and follows a similar format, with their logo at the top and often includes an exact date, time and location of the attack. Other groups go one step further by prerecording a confession by the perpetrator or by releasing footage from the actual attack, which is then spread across the group's media channels.[17] This was ISIS's strategy after it attacked three US solders in Niger.[18]

Using messaging to clarify the perpetrator of an action allows additional attention to be drawn to the group. After the attack on London's Westminster bridge in 2017 ISIS conducted a recruiting surge, aiming to capitalize on the increased attention from the attack [103]. Demonstrating that a group was involved with an attack also allows them to show their organizational strength. Take for example recent "lonewolfs" attacks, inspired by ISIS. While one might view this ability to indirectly inspire violence as a strength of the group, others argue this actually projects an image that the group is in disarray, because it indicates the

[15]https://www.fbi.gov/news/testimony/keeping-america-secure-in-the-new-age-of-terror

[16]https://www.washingtonpost.com/world/national-security/in-fight-against-isiss-propaganda-machine-raids-and-online-trench-warfare

[17]https://www.npr.org/sections/thetwo-way/2017/05/24/529685951/what-does-it-mean-when-isis-claims

[18]https://www.washingtonpost.com/news/worldviews/wp/2018/03/05/

group was unable to actually recruit and be directly involved in the attack.[19] ISIS seemingly aware of this imaging problem, has increasingly used their media outlets to explicitly call for greater numbers of lone-wolf attacks, thus when these types of attacks occur they can point to their messages as evidence of their ability to mobilize, even if they had little connection to the attack [65]. When more than one non-state group exists within the state, there is increased need to demonstrate that a given action was carried out and sanctioned by your organization so that any benefits are conferred on your organization and not a rival's. In the past Islamic Jihad, who had a more developed media apparatus than competitor Hamas, used this advantage to steal credit for Hamas's attacks [86]. Similarly, leaders from the Taliban claim that their group's standing was diminished because other groups were taking credit for attacks they had carried out [104].

1.2.3.3 Clarifying the Ambiguities (Clarifying Actions) For groups, which often engage in a wide variety of both violent and non-violent actions, messaging provides a means to highlight this diversity of actions. While national and international news media are also important means for groups to get credit for their actions, because there is a finite amount of coverage that external press can devote to the activities carried out by a group, some activities risk not being covered. This might be particularly true if the actions occur in more remote locations [12]. Further, relying on external media sources leaves a group venerable to the shifting interests of media companies. For groups that have their own media outlets, they can ensure that their actions receive publicity.

Among the variety of actions that violent groups conduct are those aimed at gaining legitimacy [59, 134]. For instance, al-Shabaab, a famously violent organization that has carried out terrorist attacks against shopping malls and universities in Kenya, also frequently uses their media to highlight the social services they provide for civilians under their control. In these high quality releases they highlight social and religious activities, such as communal prayers, and contests to memorize and recite the Quran. As the group lost control of large amounts of territory in 2011 and 2012, their media operations aimed to put a positive spin on their governing, even having local civilians offer testimonials about the good care they received from the group [8]. [94] also finds that groups highlight the inclusion of female

[19] https://www.washingtonpost.com/world/national-security/a-battered-isis-grows-ever-more-dependent

combatants to further boost the legitimacy of their group. Importantly, this ability to publicize social programs and other legitimacy increasing activities is particularly important for violent groups as it may reduce the negative reputational costs associated with civilian victimization [42].

In fact, [36] makes the case that publicizing non-violent actions are a key part of group's messaging strategy. By focusing on actions such as community and state-building projects groups can help attract individuals that would be turned away by being bombarded with brutal acts of violence. They find that only a low percentage of al-Qaede and ISIS propaganda feature violent images. In addition these non-violent materials may be more difficult to effectively counter because they are less well understood and often not taken seriously, despite the central role the play in groups communication strategy.

1.2.3.4 Clarifying the Ambiguities (Clarifying Goals) As laid out by [55] the political purpose of any given violent attack may be initially unclear without additional information. Due to this potential for muddling of intentions, groups regularly make public addresses to clarify their motivations. In El Salvador the Farabundo Martí National Liberation Front (FMLN) used radio stations to build support for their movement among the population, while outlining their goals for the future of the country. The group also used these stations to announce when their group's operations might cause road closures, effecting travel. Their intention was that listeners would come to rely on the group for vital information, and thus accept the credibility and legitimacy of the group, leading to deeper engagement [31].

Messaging about a group's motivation can also have important impacts at the international level, as states may be interested in dealing with groups that share a similar philosophy or objective. Perhaps the most clear examples of state support for violent groups being a function of their perceived goals can be found throughout the Cold War. The United States was willing to provide support for a variety of movements that were perceived as being anti-Communist or anti-Marxist. This included groups such as the Contras in Nicaragua, the Mujahadeen in Afghanistan, and UNITA in Angola. When the Contras were aiming to gain support from the US, the group's leader Adolfo Calero said much of his time was spent aimed at convincing US leaders that his group cared about human rights and other US concerns. "I'm here to answer questions...and to show that we aren't killing babies." [97]. This and

further lobbying efforts helped resume aid for the Contras, while similar efforts repealed the Clark Amendment, which prevented the US from providing aid to UNITA in Angola [97]. Outside the Cold War, [70] finds that Libyan groups which were perceived as being more amenable to democracy were more likely to receive support from the United States. The US Secretary of State was explicit that he agreed to meet with the National Transitional Council (NTC) in Libya, in part, because the group made public statements about its support for democracy and its opposition to groups like al-Qaeda [70]. The Kosovo Liberation Army (KLA), also benefited from US led NATO air campaigns, because they were able to convince the US that their group was not fueled by sectarian grievances, and that they were not in contact with Islamist groups [115]. Similarly, the Mujahedin-e Khalq (MEK) in Iran, have gone from a group on the US terror list, to bipartisan congressional support by expressing opposition to the Iranian regime, and enlisting Western lobbyists.[20]

1.2.3.5 Clarifying the Ambiguities (Clarifying Competence) Messaging also provides the opportunity to connect a group's actions to their goals. This can be done by either pointing out how their actions are furthering their goals, or in cases were their actions deviate from their goals, providing an explanation for why that is the case. Most generally, groups aim to link their conflict to universal ideals of justice to change the perception of their group and to mobilize support [16]. [78] make a similar case that media wings can be used to frame armed group's use of terrorism as part of a larger revolutionary narrative. This is thought to help groups reduce the reputational costs of using terrorism. An example of this occurs in the first issue of al-Shabaab's magazine *Gaidi Mtaani*, the sole article in English aims to reach out to non-supporters in Kenya. The article aims to present "their side of the story", while comparing the actions of the Kenyan government to previous Western occupations of Iraq and Afghanistan.[21] This strategy was also pursued by The PIRA who attempted to present their use of terrorism as a defensive response to British oppression, focusing in particular on the internment and ill-treatment of suspected PIRA members by British forces [152]. At other time the group even invokes historical tragedies such as the Irish Famine or British response to the 1916 Easter Rebellion [19].

[20] https://www.middleeasteye.net

[21] https://azelin.files.wordpress.com/2012/04/gaidi-mtaani-issue-1.pdf

One common tactic of demonstrating competence is to provide explicit justification for the actions carried out by a group. [153] notes that providing justifications for the use of terrorism in particular, is necessary for groups that hope to gain support from the public. Statements released by Hamas's armed wing for example often include a brief description about why an attack was carried out. For instance, a statement claiming credit for an attack on Tel Aviv in 2012 contained the message "These operations are part of the repelling operations against the occupation assaults on Gaza Strip and West Bank, and as a response for the ongoing aggression against Palestinian people."[22] In addition, the IRA's manual, the Green Book, notes that while some of the group's actions may harm public support, this could be minimized through the use of "defensive campaigns." A former IRA leader notes "If you are going to blow up 8 Protestants in Trabane in 1992 on the way home from work you have to have your defensive ready. And what is you [*sic*] defensive. These people were working on a UDR base ... so they weren't actually Protestants at all ... forget about that part of it ... these were the enemy, they were collaborators" [127, p.1077].

Producing explanations for your actions can also provided cover for potential state sponsors. A report by The Daily Telegraph claims that Hamas is using Turkey to plan terror attacks against Israel. While the government has denied this report, they did state that Hamas is not a terrorist organization, but a political party. Similarly, President Erdogan has met with Hamas leader Ismail Haniyeh, and has offered to continue their support for the group [126]. Another clear example of expressions aiming to sway international opinion came in 2017 when Hamas toned down the language used in their charter. In particular, they replaced the word "Jews" with "occupation" to avoid criticisms of anti-semitism [6]. It was thought that these changes, among others, could help the group increase their inclusion in the international system. In the past some of Hamas's attempts to blur the line between them being a terror group and a political party have been successful. For instance, India abstained from a UN vote condemning Hamas for firing rockets into Israel. They along with 28 countries who voted against, ensured the measure failed. This results was taken as a victory for Hamas [131]. Similarly, after Hamas condemned the 2006 bombing of the Dahab

[22] `http://www.qassam.ps/statement-1475-Al_Qassam_Brigades_Fire_Fajer_5_missile_at_Tel_Aviv.html`

resort in Egypt, they were commended by France, who noted it was a "major foreign policy step" [85].

1.2.3.6 Costs of Not Messaging In addition to messaging helping groups to overcome the ambiguities of violence, there are also more general costs that groups pay by not engaging in messaging. For one, because groups do not operate in isolation, instead competing with other state and non-state actors, choosing not to engage in messaging leaves a group vulnerable to having their motives and actions defined by competitors. In the worst case, the state or another non-state competitor could issue their own statements that cast the group in a poor light or muddle their positions on various issues. Without a counter-narrative from a given group, their competitors may be able to shape the discourse around that group. Returning to the Hamas example at the opening of the chapter, without the ability to message, Hamas's image would have been shaped by their competitors, Fatah and Israel. This is significant because, 1.) each of these actors exerts effort to undermine Hamas, particularly in the eyes of the international community 2.) Successfully convincing the US and other states that Hamas was connected to al-Qaeda might trigger intervention, which would be an existential threat to the group.

Groups without messaging apparatuses may also fall prey to other actors releasing unsanctioned statements on their behalf. For instance, in 2019 the People's Protection Units (YPG) in Syria, released a statement through their website and on Twitter noting that someone had been impersonating the group's leader on social media and that these statements were not affiliated with the group.[23] Again without this ability to point out unofficial messaging efforts, groups may find that their brand is tarnished and their positions undermined. In fact, even supporters issuing unofficial statements may harm the group if these messages deviate from the group's ultimate aims. [144] notes that before ISIS had formalized their messaging on twitter, that individuals spread false information about the group in what appeared to be official statements, even using ISIS logos. al-Qaeda in the Islamic Maghreb (AQIM) and the Taliban also faced a similar problem, having to exert significant effort to disavowing unofficial communications [141].

[23] https://www.ypgrojava.org/Statement-regarding-social-media-accounts-impersonating-senior-YPG-officials

Finally, while not being able to receive credit for an act of violence reduces the organizational benefits of the actions, there are potentially more pernicious consequences stemming from a lack of messaging. Particularly, when multiple groups exist in the same space there are incentives for groups to claim credit for attacks they did not carry out, in order to free-ride off the efforts of their rivals. Thus a group without the ability to broadcast their responsibility for an attack, might find that their more media capable rival is actually able to benefit from their efforts. In practice, this concern is has been pointed out by violent non-state groups. Leaders from the Taliban claim that their group's standing was diminished because other groups were taking credit for attacks they had carried out [104]. similarly, Islamic Jihad, who had a more developed media apparatus than competitor Hamas, used this advantage to steal credit for Hamas's attacks and boost their profile [86].

1.3 Dynamic and Varied Narratives to Mobilize Support

While messaging offers clarification for the various ambiguities of violence, pursing a purely static or unidiminsional messaging strategy is unlikely to achieve the goal of massaging, to mobilize support. Rather, because groups need to recruit from different pools of potential supports they need to utilize a variety of messaging types. This means striking a balance between seeking credit for actions, explaining the positions of the group, and pointing out the failures of rivals. Further, because on the ground conditions change, the messages sent by groups must also be able to adapt. This includes responding to the actions and messages of competitors, but also ensuring that the passage of time does not leave a group's message obsolete.

1.3.1 The Need for Variety in Messaging

As noted in previous sections violent non-state groups rely on a variety of different sources of support. Some groups are funded largely from external state sponsors, while others aim to mobilize support from a domestic ethnic constituency, still others aim to lobby the international community for support and recognition. Mobilizing support from these different sources likely requires sending a different set of messages. Further, because groups often seek out different combinations of these sources of support (and others), they need to

send a variety of signals about their organization. Some support may be mobilize because an individual agrees with a group's proposed goals. Others might be skeptical of rhetorical goals and instead favor groups that can point out their successes, whether military or political. Finally, other actors may support violence only conditionally. For instance, violence that more closely follows international law, avoids targeting non-combatants, or which can be spun as part of liberation, rather than vengeful bloodletting. In sum the variety of potential support types also requires variety in the messages aimed at mobilizing these support bases.

Returning to the parties literature, sheds additional light on how an array of message is useful for mobilizing coalitions. Being able to provide a broad set of messages allows parties to both convince current supporters that they still represent their core interests, while also appealing to new potential supporters with the promises of what the party will do. In turn, parties that are able to successfully make broad appeals have been found to have greater electoral success [133]. A well cited example occurred during the 2010 election in the UK. There David Cameron, aiming to end over a decade of Labour party control, engaged in a broad campaign which both promoted civil liberties to appeal to Liberal Democrats, alongside a more traditional liberal-conservative agenda to attract voters that had left the Conservative party for the Labour party [10].For violent groups, the utility of broadcasting a variety of messages is also supported by previous work, in particular [73]'s finding that individuals within civil conflicts are not only driven by the conflict's "master cleavage," but also local interests. So while some individuals may be motivated to support a group based on general ethnic or religious motivations, others may care more about local safety or score settling. This then creates the need to provide messaging across these variety of motivations. Evidence from Syrian rebels further supports the notion of varieties of motivations for supports. [100] interviews of rebels find that while the members claim unanimous support for their groups goals, few claim to be motivated by religiosity. Instead a key motivation seems to be the desire to get revenge against Assad forces. In addition others find that individuals join, not only for political, but also social reasons [63]. Collectively these different motivations require groups to be able to send a variety of signals, to win their support.

1.3.2 Dynamic Messaging

Regardless how compelling or varied a group's set of messages are at a given time point, if they are unable to adapt to changes over time, groups run the risk of losing mobilization benefits. To stay relevant groups need to be able to respond to changes in the messaging of their competitors as well as changes in the political environment over time. This notion is consistent with evidence from the parties literature that parties not only change their platforms, but that individuals actually update their perceptions based on these changes [38].

First, because violent groups often face competition from other non-state rivals, they must consider altering their messaging in response to their competitors. For instance, if a group changes their messaging in a way that is more inline with their competitors, this may reduce the potential benefits gained from drawing attention to this issue. It is more difficult to differentiate on a dimension were you and your competitor are very similar. This can be remedied by finding new cleavages between your group and your rival's, or by pointing out that your rival's new position is inconsistent with their previous actions/statements. In traditional politics we frequently see politician being branded as "flip floppers" because they take support positions that they formerly opposed. Further, groups rushing to adopt a popular message that deviates from their past behavior risk being labeled insincere opportunities.

The second dynamic is time. Over time not only do competitor's positions change, but so does the political reality. Some sudden events can quickly change the salience of issues in unexpected ways. For instance in April and May of 2020 violent groups were quick to use the COVID-19 pandemic as an opportunity to promote their groups.[24] Without the ability to adept your core messages to changing circumstances a group runs the risk of looking irrelevant. In other cases public sentiment may change more slowly. As noted by [44] while groups may focus on their own pet issues they are also forced to pay attention to issues that come on to the agenda. For instance, Ansar Dine aimed to boost their relevance and appear more responsive by rolling out a program which collected questions from the press and broadcast these answers publicly [17]. Similarly after the Armed Islamic Groups (GIA)

[24]https://www.ispionline.it/it/pubblicazione/islamic-state-and-coronavirus-time-comeback-26166

were criticized and disowned by former allies Egyptian Jihad Group and Libyan Islamic Fighting Group due to their violence against the Algerian public [67, 3], the GIA published a lengthy Q&A with their leader Abu Talha Antar Zouabiri. As noted by [3], this interview was conducted because the GIA had begun to stall and were aware that their actions had led supports to doubt the group. In the face of changes either dramatic or gradual, simply returning to the well of "greatest hits" will likely have decreasing marginal returns. Rather, a messaging program that is static, might actually highlight that the group is out of touch and ineffective.

1.4 Observable Implications

If as theorized messaging aids in overcoming the ambiguities of violence, in turn helping mobilization, then the expectation is that groups will attempt to take advantage of these opportunities by competing not only through violence, but also in the public statements they make. This competition, through messaging, for hearts and minds is at the core of the battle over perceptions. To evaluate the evidence I first lay out a series of observation implications consistent with battles over perceptions taking place. This involves groups aiming to mobilize support for their movement and demobilize support for their competitors. This is done by using messages to clarify their group's actions and goals, as well as providing explanations for why they have or continue to pursue these goals or strategies. Of course, because battles over perceptions require additional actors, groups also aim to make contrasts with rival groups and demobilize support for these movements. Thus groups also cast blame on rivals for their actions, aim to denigrate their goals, and point to inconsistencies in their groups actions. Second, I expect groups to use messages alongside violence as a complementary strategy. Again messaging should not replace violence, but be used to clarify some of the inherent ambiguities of carrying out violence. Finally, to effectively mobilize support (or demobilize opposition) the messages sent by groups must respond both to on the ground changes in the political environment, and to the statements made by competing groups. Messaging that did not reflect the current political reality, would quickly become obsolete, and signal weakness, rather than organizational strength.

1.4.1 Variance in Messaging Type

As noted previously, for there to be a battle over perceptions, we expect substantial variation in the messages sent by groups. If groups were to send exactly the same messages regardless of on the ground conditions or group aims, messages would provide little means of differentiating one group from another. In particular, we expect two broad strategies to be undertaken, 1.) using messages to mobilize support for their group 2.) using messaging to demobilize support for competitors. In turn these strategies are pursued by specific types of messages which help to overcome the individual ambiguities of violence.

1.4.1.1 Mobilizing Support (Reducing Ambiguity of Own Actions and Attribution) I expect groups should engage in messaging that clarifies the perpetrator of their actions, while pointing to the variety of actions the group carries out. Frequently, this involves a group calming credit for an act of violence carried out by the group. For instance in September 2019 Houthi rebels in Yemen claimed credit for a series of drone attacks, which disputed roughly half of Saudi Arabia's oil capacity [5]. However, as groups may also have aims to carry out state-like functions or to gain international legitimacy, they also have reason to draw attention to their non-violent actions. For example, In 2007 Hamas claimed credit, not for kidnapping a Western journalist, but for freeing one. After Hamas negotiated the release of BBC journalist Alan Johnston from the Gaza based Army of Islam, they held a press conference with Johnston and used the opportunity to promote their organization as supporting law and order in Gaza [48]. This notion is consistent with the findings of [138], that establishing a good reputation, through social services and media operations, provides an additional means for groups to differentiating themselves from rivals.

I also expect that groups will point out actions that they claim not to have carried out. Hezbollah, for example has spent considerable efforts to undermine the Special Tribunal for Lebanon (STL), which investigated the assassination of Lebanese Prime Minister Rafic Hariri. Across their many media platforms the group attempted to paint the STL as an American and Israeli conspiracy against them [80]. This counter-messaging was particularly critical given Hezbollah's association with individuals accused of carrying out the act.[25]

[25] https://www.bbc.com/news/world-middle-east-14345997

1.4.1.2 Mobilizing Support (Reducing Ambiguity of Own Motivations) To mobilize foreign and domestic support groups also benefit from laying out what they stand for and what they aim to achieve politically. I thus expect that groups will publicly state their group's goals. Groups may promote very general goals, such as claiming to want to restore order or promote peace, or they may promote very specific positions, such as the Real IRA's opposition to the Good Friday Agreement. In particular groups that message about their support for the democratic process, have been found to gain additional legitimacy [20] and even support from Western audiences [70]. An example of this includes the Kosovo Liberation Army (KLA) making clear it was not affiliated with Islamic extremists and that their struggle was against a repressive regime and not based on sectarian lines. Ultimately, the US and NATO would conduct an air campaign which led to a Serbian retreat in Kosovo [115].

Group goals are also often presented in opposition to the goals of competitors. Hamas for example has used their messaging to differentiate themselves not only from their domestic competitor, the Palestinian Authority, but also international terrorist organizations such as al-Qaeda [22]. After 9/11 the group condemned the attacks and were explicit that they were not affiliated with al-Qaeda, and were instead focused on the Palestinian territories [65]. Going a step further they pointed out that if they were removed more radical groups would take their place [99]. In the Democratic Republic of Congo, the M23, also aims a significant amount of its content to counter accusations by the UN that their group's aim is to capture control of resource rich areas [40].

1.4.1.3 Mobilizing Support (Reducing Ambiguity About Competence of Connection Between Own Actions and Motivations) I also expect groups to send signals that they are competent and able to effectively pursue their political goals. This includes providing justifications for their actions which may reflect negatively on the group, such as killing civilians, as well as making connections between their actions and their political goals. For instance, Hamas frequently cites Israeli occupation and violence against Palestinians as the reason for their violence. They also point out that because most Israelis are members of the armed forces they are not actually targeting civilians when they launching rockets into crowed population centers. Further, Hamas does not simply say they are opposed to cooperation with Israel, but often makes the case that they refuse to cooperate because it would

be a betrayal to previous Palestinians who had been killed by the state. When actions are taken which may harm a group's standing I further expect groups to provide a justification for the act. AQIM for example tries to distance themselves from the reputational costs of killing Muslim civilians, by claiming that those killed had ties to 'apostates' [140]. Similarly, groups aiming to reduce hostilities, may also face doubt and push back. Here messages are used in a similar manner, for groups to lay out why they have decided to negotiate or reduce tensions.

1.4.1.4 Demobilizing Opposition (Reducing Ambiguity of Rival's Actions and Attribution) An additional implication of battles over perceptions are groups not only aiming to mobilize support for their group, but also demobilize support for their competitors. This is conceptually similar to attacks ads in traditional politics. Here the focus is more on making a case against a competitor, rather than for one's self. To do this groups must engage with the actions and positions of their rivals.

As groups aim to demobilize support for their rivals, I expect them to cast blame on competitors for the results of their actions. One form of blame involves pointing out unfavorable actions carried out by rivals. For instance, Hamas often releases statements detailing instances where their competitor, the Palestinian Authority (PA), engages in repression or violence against Palestinians. In one case, they note that PA security forces surrounded the house of a civilian, opened fire on it, and threatened to kidnap his children. The statement further notes this was done because he spoke out against torture in PA jails.[26] In another instance they blame the PA for their decision to defer a vote by the UN's Human Rights Council which would have referred a report accusing Israel of committing war crimes, to the UN General Assembly.[27] Blame can also be cast for more general group behavior. In a speech by Hezbollah's leader Sayyed Nasrallah, he not only blamed ISIS for destroying holy sites in Iraq, but further warned that the group was a threat to Iraq and the entire region region.[28]

[26] alQassam.pa, January, 22 2010

[27] alQassam.pa, January, 26 2011

[28] "Sayyed Nasrallah's Full Speech on the Commemoration Ceremony of Martyr Leader Ali Fayyad." al-Manar March 2016

1.4.1.5 Demobilizing Opposition (Reducing Ambiguity of Rival's Motivations)

I also expect groups to not only focus on the actions of competitors, but also the positions they take on various issues. This observable implication is essentially the opposite of a group clarifying their own goals. Groups often aim to reduce the legitimacy of competitors by pointing to their brutality, for instance Al-Qaeda distancing themselves from ISIS's brutality in recent years. A specific example occured on March 20, 2015, after ISIS bombed four mosques in Yemen, and al-Qaeda in the Arabian Peninsula (AQAP), condemned the attack and claimed that their group does not bomb mosques [76]. Ansaru, an al Qaeda affiliate in Nigeria, took a similar route when they claimed they were different from competitor Boko Haram because they do not murder Muslims or launch attacks on public places.[29] On the other hand, groups also make the case that competitors are weak, by pointing out their willingness to compromise. An example of this occurs just after the signing of the Good Friday Agreement by the English and Irish governments, as well as non-state groups such as the Provisional Irish Republican Army (PIRA). Here a splinter of the PIRA, the Real Irish Republican Army (RIRA), claimed the PIRA were traitors and collaborators with the English government [93]. Interestingly, in prior decades similar comments were made by the PIRA, to undermine their predecessor, the Official IRA, who they believe had betrayed the republican movement after ending hostilities with England [152].

1.4.1.6 Demobilizing Opposition (Reducing Ambiguity About Coherence of Rival's Actions and Motivations)

I also expect groups to point out inconsistencies in the actions and motivation of their competitors. For example ISIS uses their English magazine Daqib to point out gaps between al-Qaeda's actions and claims [108]. One frequent argument is that al-Qaeda is deceiving Muslims and that they are actually collaborating with the Syrian regime and Western powers [65]. In a recent documentary produced by ISIS they take aim at both al-Qaeda and the Taliban. The later allegedly for fighting ISIS rather than Western invaders, and the former for blessing this arrangement.[30] ISIS also highlights, that despite the bluster from al-Qaeda, only their group has actually been able to establish a

[29] https://www.longwarjournal.org/archives/2015/02/jihadist-divisions-grow-in-nigeria.php

[30] https://www.longwarjournal.org/archives/2020/05/analysis-the-islamic-states-ideological-campaign-against-al-qaeda.php

territorial caliphate.

1.4.2 Messaging Alongside Violence

The second observational implication is that groups use messaging alongside the violent actions they carry out. Thus we would not expect a group to increase their use of violence, while decreasing the amount of messaging they produce. This is consistent with [64], who note that ISIS uses their messaging to reinforce the effects of the actions they carried out. While, [122] find no correlation between number of statements and number of attacks carried out by ISIS, they also acknowledge they may be using an incomplete proxy for the relationships they aim to measure. I return to this issue in the research design section. As detailed above additional evidence of the complimentary nature of violence and message are found in acts of violence having accompanying statements, which allow a group to claim credit for the act or include justifications for their actions, particularly the use of violence.

1.4.3 Responsiveness of Messages

Finally, to provide additional evidence that messaging is useful to groups, I expect messaging to change along with on the ground situations. There are two key means of evaluating this observable implication. The first is that within a group we would expect there to be variation in messages over time that reflects political changes. For instance when Hamas intensifies their conflict with Fatah leading up to an electoral victory in 2006, and an eventual takeover of Gaza in 2007, this intensity, as well as shifting focus, should be reflected in Hamas's messaging. Second, for a true battle over perceptions to be talking place, groups should actually respond to the positions and actions of their competitors. This could manifest in direct references and rebukes of their competitors, as well as groups shifting the content of their messaging in response to that of their rivals.

1.4.4 Summary of Observable Implications

To aid the reader below is a list of each of the observable implications detailed in this chapter.

1. Variance in Messaging Type

a. Mobilizing Support

   i. Reducing Ambiguity of Own Actions and Attribution

   ii. Reducing Ambiguity of Own Motivations

   iii. Reducing Ambiguity About Competence of Connection Between Own Actions and Motivations

b. Demobilizing Opposition Groups

   i. Reducing Ambiguity of Rival's Actions and Attribution

   ii. Reducing Ambiguity of Rival's Motivations

   iii. Reducing Ambiguity About Coherence of Rival's Actions and Motivations

2. Messaging Alongside Violence

3. Responsiveness of Messages

1.5 Competing Explanations

1.5.1 Only Violence

One competing explanation is that violence and messaging are substitutes rather than compliments. If messaging does not provide unique benefits, then it's use would simply increase costs for groups. If this were true we would expect a negative correlation between the use of violence and the use of messaging.

1.5.2 Only Attention

This can be thought of as an extension of the first competing explanation. Instead of violence and messaging being pure substitutes, it is possible that messaging is useful only in helping groups garner attention for their violent acts, not to promote broader political messages. While almost all groups want attention, they may not have a more comprehensive communication strategy. This suggests that while we might find a positive correlation between the use of violence and the use of credit claiming, we would not expect position taking to be correlated with violence. Similarly, we would not observe groups crafting justifications for their actions or responding to the messaging of competitors.

1.5.3 Extremism

Finally, it is possible that messaging is used strategically, and is responsive to that of their competitors, but only in an effort to outbid rivals. This is the same logic as ethnic outbidding proposed by [57]. Here groups become more extreme in their rhetoric to outbid competitors. More extreme rhetoric may also have the effect of demonstrating that their group is more committed [15, 83, 28]. If extremism is more effective at shaping support and showing resolve, then despite "type" all groups should go extreme in their messaging. Thus we would not expect to see groups moderating their positions.

1.5.4 Everybody Lies

The question remains why should we believe the messages violent non-state actors send? After all, actors in systems with more direct means of accountability routinely lie about their goals, accomplishments, and the characteristics of their competitors. Surely an international terrorist group, who can not simply be voted out of power, must have even less credibility. In fact, this is true, groups have incentives to lie about their commitment, their intentions, and their broader political goals. However, there are both reasons to believe that groups have incentives to not lie too much, and that the way groups lie can still provide information about how these groups want to be perceived.

First, groups are not unbounded in the messages they can make while retaining credibility. While any actors can theoretically produce any message, taking a position inconsistent with your beliefs and the actions you have taken creates an opening for opponents to point to these inconsistencies to undermine your group. For instance, al-Qaeda has pointed out that while ISIS claims to want to protect Muslims, their brutality and conflict with other Islamic groups such as the Taliban, actually undermines the broader goals of the Muslim community and aids rivals such as the United States [32]. ISIS in turn has questioned al-Qaeda's committed to an Islamic system of government because they have backed pro-democracy groups such as the Muslim Brotherhood [32]. The ability to undermine a rival group becomes easier as groups drift further from their actual goals, and as the gap between their actions and statements increases. In addition there may be benefits to sincerity for groups.

As noted by [116] sincerity can be an advantageous strategy because there are costs for putting forward positions that mimic your positional rivals. For instance, if a Republican suggested addressing unemployment through large scale government programs, this would 1.) go against established GOP positions 2.) More importantly, as this position is consistent with the Democratic platform it would be easier for them to go further in this direction, making the Republican look uncommitted.

Second, when we read the messages of groups, they do not follow the patterns of cheap talk.[31] In particular, we do not see groups with competing interests, such as Fatah and Hamas, sending the same messages. Further, we do not see pooling effects of messaging were even more moderate groups are uniformly pretending to be more violent and extreme to gain resources. Similarly, extremist groups are not consistently moderating their messages to appear as if they are ready for compromise. Rather, rebel groups seem to send messages that contextualize and build upon their violent actions, which may include moderating on certain dimensions. This false dichotomy, where violence is seen as credible, and messages as cheap talk, ignores the fact that violence and messages are used in concert. As noted previously, in terms of mobilization, messages provide necessary benefits for violent groups above those that could be gained by engaging in violence in isolation.

Finally, as long as there is variance between groups in the types of lies that they make, we can still learn about how they want to be perceived. For instance a group may be claim to be a brutal organizations that will punish unbelievers harshly, even though they do not actually care about punishing non-believers. However, observing this message consistently, does tell us that this group is concerned with seeming tough on this dimension. While we can not necessarily infer their true type, we can infer they are the type that would send these kinds of messages. By observing variation across groups, that is some groups being unwilling to send these types of messages, we can separate groups by their messaging type.

[31] The notion is further supported by [46], who use a formal model to demonstrate that in situations were the composition of potential supporter's ideology are relatively balanced and the government's marginal costs of repression is high, messaging can signal a group's actual ideology.

1.6 Implications of Understanding Battles Over Perceptions

By making the case for the utility of messaging for groups, because of the ambiguities of violence, and the need to attract a diverse set of potential supporters, the proposed theory helps to bring the study of political messaging into the broader literature on violent political actors. Rather, than treating messages as simply cheap talk, we can instead better understand how messages compliment the violent actions these groups engage in. This in turn better connects the political dimensions of these groups to the actions they carry out. Similarly, the battles over perceptions are deeply linked to a growing literature detailing violent groups aim to attract external legitimacy. without the ability for a group to lay out their political goals and provide explanations for their use of violence, their ability to gain this external backing is likely stunted. Further, the messaging of violent groups provides greater detail about the combinations of violence and non-violent actions that groups engage in. This in turn allows additional insights into the types of actions and goals that a given group feels compelled to publicly promote.

The theory suggested here has additional implications for forming effective counter narratives against violent organizations. First, by finding groups that claim to represent the same constituency, for example ISIS and al-Qaeda, but have very different positions on an issue, can help undermine these groups. Pointing out these arguments both makes the groups look less competent, but more importantly it shatters the illusion presented by these groups, that the world is simply black and white [108]. Second, the groups themselves might supply effective counter-narrative for their rivals. Further investigating how groups point out the incoherence of a rival, and denigrate their goals and actions, provides a set of candidate messages to be refined and deployed against the group. Finally, the ways that groups attempt to explain their use of violence, or provide context for their actions, suggests potential fracture points for the group. Put another way, the need to defend your actions suggests they may be problematic. Understanding these justifications might allow outside actor to not only correct false claims made by violent groups, but to also rebuke their justifications and explanations for violence. An additional implication is that we might expect groups to issue justifications when their group engages in potentially delegitimizing actions, such as the

killing of non-combatants. By connecting the justification with the actions being justified we can better assess the conjecture. This may be particularly interesting given that extreme violence and targeting has been theorized to both help groups stand out, and to undermine their group.

1.7 Future Directions

First, while the theory laid out above details how messages from groups need to adapt to on the ground changes, there was little mention of how the medium of messaging has also changed, and the implications this change has for mobilization. There are several interesting avenues for future research. First, the rise in information communication technology (ICT) has opened the door for group's messages to be spread more widely at a lower cost, suggesting more effective mobilization. On the other hand the connectivity and ease of use also allows actors, either benevolent or malevolent, to release statements which undermine or muddle the groups positions. On social media these risks are particularly severe as a false statement might be viewed by thousands of individuals before the group has a chance to correct the record. There has also been little research that aims to systemically measure how messages have changed with the advent of social media, or how groups might send different sets of messages through their website and their social media channels. As many groups operate both social media sites and official websites/newspapers this inquiry could be further explored.

Second, by taking seriously the statements released by groups allow for extensions of this line of inquiry. For instance are the tactics laid out here effective in mobilizing support? Under what circumstances? To encourage future work on this topic it is worth providing some details about why the use of messaging and likely the effectiveness of messaging is not simply defined by a group's size or capabilities, which has already been studied in great detail. While larger groups are likely better at outreach and message discipline, there is good reason to believe that the choice to engage in messaging, and ability to do so is not determined solely by these group level factors. For one we know that groups have a variety of abilities on different dimensions of conflict. For instance the PIRA demonstrated advanced skill and creativity in bomb making, while ISIS has shown an ability to attract foreign recruits to their

group. These between group differences are also likely to hold for the variety of other actions groups partake in. Further, even groups with the ability to fund and support an effective media operation may choose not to due to group goals and opportunity costs. For instance, internal documents from al-Qaeda note that their early failures in Syria were partially due to neglecting the role of a coherent media strategy.[32]

Further, existing evidence suggests dynamics outside of group strength are at play. For instance we see powerful groups undermined by weaker opposition due to underdeveloped media operations. This was the case for Hamas who at that time were the largest and strongest group in Palestine, yet they openly complained that their weaker competitor, the Palestinian Islamic Jihad (PIJ), was perceived as more capable and effective due to their superior media strategy [86]. Similarly, In Somalia al-Shabaab was able to make gains on competitors Hizbul Islam and the Ras Komboni militia by developing a media operation that was able to attract support outside of Somalia. The use of widespread messaging allowed them to gain supports and request funding across the globe [8]. Other cases illustrate the creation of a coherent media strategy even before the formalization of the group, ruling out the possibility that these operations are driven by size or popularity. In April 1968, a group, sometimes refereed to as the Baader-Meinhof Gang, that would later form the Red Army Faction (RAF), fire bombed the Schneider and Kaufhof department stores in Frankfurt. After the attack the group contacted the German News Agency claiming credit for the attack and noting that it was an act of political revenge [124]. By 1972 the second generation RAF had formed, but already had a well established strategic media strategy both to claim responsibility for attacks and to justify their anarchic ideals [124]. While assessing the effectiveness of messaging strategies for violent non-state groups is likely a gap that scholars and practitioners would like to have filled, this process would not be possible without first laying out the strategic uses of media, as well as a system to systematically extract and record the evidence for the proposed theory. This chapter has aimed to lay out that theory, while the following chapter will present a system which can be used to systematically address additional questions such as the effectiveness of messaging.

[32]https://ctc.usma.edu/app/uploads/2013/10/AFGP-2002-600080-Translation.pdf

2.0 Measuring the Battle Over Perceptions

2.1 Previous Work Measuring Group Messages

In recent years there has been tremendous growth in the study of the messages of violent non-state actors. For the most part this has consisted of a form of content analysis were individuals close read documents, coding the occurrence of various themes or narratives within the text, or a synthesis of the themes in documents by subject matters experts. Some work has laid the foundations for why there is useful information in the messaging of terrorist groups [56]. Others have aimed to describe the wide variety of propaganda groups engage in [139, 140, 141, 8] and how group narratives change over time. Additional work has investigated the evidence of tactics such as outbidding and spoiling in these messages [108, 144], while also suggesting that novel tactics, such as bluffs, are also strategically useful for groups [93].

Another set of research has focused on the impact messages have for groups. This includes making the case for why groups benefit from engaging in messages (and suffer if they do it poorly)[39]. Other have focused on specific functions of messaging, such as aiding group's efforts to recruit new members [84] and appeal to English speaking audiences [65]. Another strand of research has focused on the how groups use messaging to provide a counter-narrative about their organization, in a effort to boost or retain membership [146, 4, 7].

This work has demonstrated the wide variety of research questions which can be directly addressed by turning to the messaging of violent political actors, while laying strong theoretical foundations for how messaging is used by these groups. However, from a research design perspective, these close reading based approaches suffer from two related shortcomings in their reliability and scalability [81]. By reliability I mean the ability to generate the same outputs given the same set of input texts. Another scholar, or even the same scholar at a different time may produce a widely different assessment.[1] Because these outputs serve as the evidence for or against a given theory, ensuring reliability is fundamental. Particu-

[1]This is not to say that the approach can not be shown to be reliable on average, only that reliability is not something that a process relying only on human coding can guarantee.

larly, for close reading assessments which rely on "I know it when I see it" decision making, the exact coding rules for a given document are likely opaque [120]. The second issue is scalability. By scalability I mean the ability of the analysis to be effectively reproduced as the number of documents increases dramatically. For an approach based purely on a close reading of the text, as the number of groups, or documents becomes even moderately large it becomes impossible for a individual to process this volume of text. While taking a random sample of the full set of documents and close reading these may help to ease the load, even a 10% sample can become overwhelming as the number of documents increases. Further when attempting to make inferences on a disaggregated form of the data (for example by month) the researcher may find that they have too few examples within a given period to drawn meaningful conclusion.[2]

Other researchers have begun to use computational tools to aid in measuring the content of the messages produced by violent non-state groups. [70] manually code the tweets from Libyan rebel groups, to assess how these messages impact external support for the groups. Others use manual annotations as training data for supervised learning. [90] study rebel messaging on Twitter by coding a small sample of the messaging into three strategies, mobilization, self-promotion, and reports on operations, and use these to fit a Support Vector Machine (SVM) which is used to predict the strategy for the remaining samples. [45] take a similar approach by coding the sentiment of a random sample of sentences in documents produced by Hezbollah which mention either a competing group, such as al-Qaeda, or an ally, such as Hamas. These codings serve as the labels to be predicted, while the words in the sentences are the features of the model. This trained model is then used to predict the labels for the remaining samples.

However, while these studies demonstrate some utility in using the messages of violent groups, both to improve measurement and evaluate theories, so far the actual use of the underlying text has been limited to coarse categories. Previous work has relied on the bag-of-words assumption, which represents a unit of text as the count of the individuals words

[2]Further, because the speed of coders is not monotonically increasing, but is fixed at some level, each new unit of text, at best, is coded at the coder's max coding speed. Put another way, after a coder has been trained, the additional documents that they code provide little boost in their speed for coding additional documents.

within the text. While this is a commonly used approach, it forces the researcher to throw away much of the information contained in textual data. Further, this processing of the text is generally not motivated by theory, but by convenience and convention. Finally, while the growth of social media has led to it's increased use and importance for violent groups, it is unclear if existing approaches could be effectively applied not only to the truncated narratives found in tweets, but more complicated communication mediums. While both the close reading of text and applications of machine learning have opened the door to the potential gains to be made from taking the messages of groups seriously, so far the richness of this data has not been fully utilized.

2.2 Data on Group Messaging

As a pilot for the approach detailed below I will rely on the communications released by Hamas's armed wing, al-Qassam Brigades. These statements were scraped from the group's official website and cover the years 2007-2016. In total there are roughly 11,000 statements, totaling over 87,000 sentences. For these sets of analyses we focus on the group's statements released in English. It is possible that the group's communication might be different in the Arabic versions of the documents, for instance the English version may be targeted more towards international audiences while the Arabic towards more domestic and regional audiences. However, these are open empirical questions that will be explored in the future.[3] Importantly, these text are translated into English by the group itself, rather than by a third party. The process detailed here could also be adapted to conduct similar analyses in a number of other languages. Other options include using machine translation [91] or directly analyze documents in multiple languages [51].

2.3 Existing Approaches in Text Analysis

To assess the evidence for battles over perceptions in the messaging of violet non-state groups we need to extract concepts that match the nuance of the theory. While there are

[3]In addition while groups like ISIS and Hamas may primarily communicate in Arabic, more broadly terrorist and rebel groups communicate in dozens of languages. The implausibility of any single researcher having competence across these languages suggests the need for larger team collaborations, the use of machine translation tools, or some combination of the two.

several methods that could be applied (detailed below) with little start-up cost, they suffer unique shortcomings for measuring the battle over perceptions. However, it is instructional to apply these coarser approaches to highlight the benefits a more nuanced, but still reliable and scalable, approach provide.

2.3.1 Topic Models

Topic models are a general term used to described unsupervised learning clustering models applied to textual data. The goal is to produce coherent topics of text estimated based on word occurrence within the text. Most often topic models refer to an implementation of Latent Direchlet Allocation (LDA) [14], or extensions of this approach [102, 121]. A topic modeling approach benefits from it low cost of use. As the model is unsupervised, no human annotations are needed. A second benefits is there is no required initial input about the contents of the latent topics (aside from the number of topics). For the question at hand, topic models do have the potential to provide information about the strategies used by groups. Because the topic themselves are estimated based on word co-occurrence, if a group uses a different set of word to talk about their own group, their goals, and the actions they carry out, relative to their rivals, this would results interesting topical variation.

For the implementation here we will use Non-negative Matrix Factorization (NMF). In practice NMF produces similar results to LDA, and generally uses the same bag-of-words input features. While the estimation is different, the same type of topic information will be reported, and the same potential shortcomings of the approach also apply.

$$\underbrace{D'}_{d\times n} \approx \underbrace{V}_{d\times K}\underbrace{U'}_{K\times n}$$

To uncover latent topics within the documents we use Non-negative Matrix Factorization (NMF). NMF works by factoring the original document-term matrix into a lower dimensional representation.[4] This can be expressed as such. The U' matrix contain information about each document's membership to each of the K topics. Thus documents that are strongly related to a given topic will have larger values in U' for a given k. Importantly, documents

[4]Here unlike Singular Value Decomposition (SVD/LSI) we do not constrain the latent dimensions to be orthogonal, allowing topics to be related.

might belong to multiple topics, and thus have non-zero elements for multiple topics in U'. The V matrix contains the distribution of words over topic K. Words that occur frequently in a given topic will have large values in V. Because the resulting matrices are non-negative NMF also has a nice sum of parts interpretation. Each U_r is an n by 1 matrix, while each V_r is a d by 1 matrix. Thus for each topic we can construct the n by d document term matrix that created it. We can approximate the full document term matrix by summing across the K topics $D' \approx \sum_{r=1}^{K} U_r^T V_r$. D' is a document-term matrix, where D_{ij} is the count of the jth term in the ith document. Here each column of U is a vector in latent topic space. Each column of V projects the latent k-space to the observed document term matrix D'. Using the U matrix we can find the i terms most associated with each of our K topic by simply using the largest corresponding values in U_k. These clusters can then be interpreted to evaluate the quality of the approach, and explore the content in the text.

After finding the underlying topics in our corpus, we can then use this information to classify each document as being primarily about a single topic. This is done by selecting the largest value on dimension K for each document n in V. After classifying each document as being about one of the K topics we then calculate the proportion of the documents belong to each topic K for each time period t. Investigating the amount each topic is used can produce some information about a given groups communication strategy.

While the approach has the potential to summarize the content of the messages released by groups, it also has some likely shortcomings when attempting to more deeply understand the strategies employed by these groups. The first shortcoming is actually a limitation of the data processing, commonly used for topic models. The bag-of-words assumption (BoW) treats a given unit of text as simply a count of each of the unique words in that unit. Here word order and syntax are removed. While this assumption may seem invalid on it's face, it is often the default approach to processing textual data, produces surprisingly cohesive results, while having low computational cost. However, when attempting to measure the strategies employed by groups in their messaging it may be especially problematic. Looking at the two sentences below, it is clear that they are communicating very different opinions. In the first sentence it is Hamas that favors of peace, while in the second it is al-Qaeda. However, problems emerge when we convert these sentences to BoW. In fact, these sentences are

identical in their BoW form.[5] While this is a simple example, one could imagine countless sentences where attempting to extract the given strategy being employed by a given actor, would be impossible if all you were given was a count of the words in the sentence.

Sentence 1: "Hamas supports peace, al-Qaeda does not."

Sentence 2: "al-Qaeda supports peace, Hamas does not."

Table 1: Bag-of-words representation of Sentence 1 and Sentence 2. Notice that despite the sentences conveying different positions, they have identical representations.

	supports	peace	Hamas	al-Qaeda	does	not
S1	1	1	1	1	1	1
S2	1	1	1	1	1	1

2.3.2 Sentiment Analysis

Another widely used off-the-shelf approach is sentiment analysis. Sentiment analysis aims to measure the negative and positive valence of words in a given unit of text.[6] Broadly speaking, the expectation is that groups will speak more negatively about their rivals and more positively about their allies. To measure the sentiment of the messages of non-state groups over time we utilize a dictionary-based approach.[7] Dictionary based sentiment analysis relies on a pre-made dictionary which labels the positive or negative sentiment for a large list of words. As there is no sentiment dictionary specific to the statements of violent groups, we use a general sentiment dictionary, AFINN-111 [106]. The AFINN-111 dictionary contains a sentiment score for thousands of words.[8] To try and dis-aggregate as much as possible, while still maintaining a coherent unit of text, we conduct the analysis at the sentence level. Within a sentence we sum the sentiment scores (1,-1) of all the words in

[5]The use of n-grams may help elevate this issue, but it also increases the number of parameters in the model exponentially, and inevitably leads to noisy representations.

[6]This approach has been previously used to study the alliances and rivalries between violet non-state actors by [45].

[7]While a supervised learning based approach likely produces more accurate classifications for this task [45], a supervised learning approach is considerably more costly, as human annotated training data must be produced. Further, that approach does not address the potential shortcomings of the approach detailed later.

[8]The dictionary can be found here `http://corpustext.com/reference/sentiment_afinn.html`

that sentence. If the sum is greater than 0, the sentence is classified as positive. If it is less than 0, it is classified as negative. These values can then be averaged within a given unit of time. Two examples below provide more concrete examples. In each of these cases there are only either negative or positive words, so the sentences would be classified as positive and negative respectively.

Table 2: An example of a positive sentence based on the AFINN sentiment dictionary. The positive sentiment words are in green.

Hamas	is	keen	to	establish	calm	and	quiet

Table 3: An example of a negative sentence based on the AFINN sentiment dictionary. The negative sentiment words are in red.

Many	Palestinians	have	been	injured	in	ongoing	Israeli	attacks

However, here again we run into limitations of the approach. The first issue is that while we might be able to reliably extract the sentiment of words in a sentence, these words are again detached from their context. Moreover, the sentence level sentiment can actually mask significant variation and nuance. Table 2.4 provides a sentence that is negative overall, but also contains an instance of taking position in favor of an action. Further lost is that the support is for the act of "resistance," while the opposition is directed at the regime and their "violence."[9]

Table 4: An example of positive position taking embedded with a sentence who's overall sentiment is negative.

We	support	resistance	against	the	criminal	regime's	violence.

Further problems emerge if we take the same sentence as above, but now remove the word "criminal." The net sentiment would now be 0, meaning this score would be equivalent to a sentence which contained no sentiment.

[9]Aspect based sentiment provides a means of solving this issue [89]

Table 5: An example of a sentence who's net sentiment is 0 because there are equal numbers of positive and negative words.

We	support	resistance	against	the	regime's	violence.

2.3.3 Combining Existing Approaches

Each sentence is passed to the fitted topic model to produce a topic label for the sentence. This provide a summary of the content in the sentence. For each of these sentences we will also conduct sentiment analysis. Thus we will know what the sentence is generally about, and the aggregate sentiment on that topic. It is worth noting that this approach does not actually solve the issues presented above, as widely different sentences can produce the same topical representation, while aggregate sentiment can miss the valiance on individual issues or actors. Because the approach incorporates a variety of information it does potentially represent an improvement on existing studies of the messaging on violent non-state groups.

2.4 Annotating the Modalities of Rebel Speech

Before we can identify the strategies used by violent non-state actors we need to lay out a procedure to annotate the relevant information from their statements. This is crucial to connect high dimensional language to more fined grained categories, which have theoretical relevance, while still maintaining fine grained information that would be lost using bag-of-words based approaches. Most generally these modalities represent actors, aspects, and judgements.[10] Actors are the entities that are carrying out some action or taking some position or are being targeted by an action or position. Aspects are the general features of the world that groups compete over. Judgements are expressed positions on given aspects.

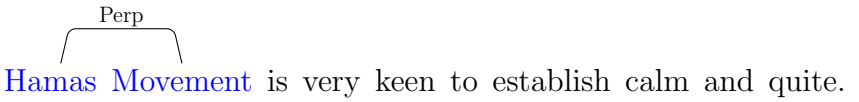
2.4.1 Actors

Actors are the entities that engage in the various strategies such as credit claiming or position taking or who have their positions or actions criticized by competitors. Clearly if we want to speak to the variety of ways groups use messaging it is necessary for us to identify

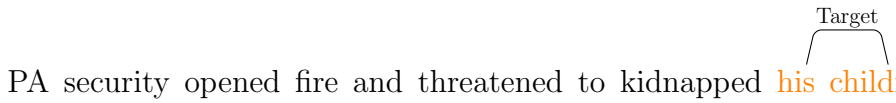
[10]The annotations and coding rules detailed below are an extension of PULSAR v3.0 [26]

the group or groups that are being referenced.

2.4.1.1 Perpetrator This is the actor that is taking some position or claiming credit in a given sentence. Often times this actor will be included in the subject of a sentence. This coding should be as inclusive as possible. For example in the sentence "Israel's tanks fired at the rebel", the Perpetrator should be "Israel tanks." Later processing steps can for instance collapse all Israeli related phrases, such as"Israeli planes", "Israeli Jeeps", into a standard coding such as "Israel" or "Israeli Military."



2.4.1.2 Target/Victim This is the actor or actors that the judgement or action is being directed towards. The actor often falls in the object of the sentence. Like the coding for perpetrator this coding should be as inclusive as possible. In general coding should aim to avoid coding a location as the victim. This is because the locations, specific to a particular group are unlikely to generalize and may lead to overfitting. Further as the model does not aim to extract information on the locations where a given action or judgement takes place[11], including this information creates the potential for additional false positive predictions. However, there will be instances where there is not a more specific target and thus the location can be the target. For example in the sentence, "The operation is part of a resistance campaign against the occupation army assault on the Gaza Strip" the Target should be "Gaza Strip."



2.4.2 Aspects

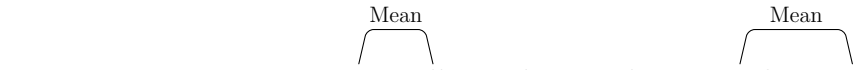
Aspects are the elements of the world that are being claimed or judged. Extracting aspects is crucial as these provide insight into what groups are actually doing. In particular, to show that groups engage not only in credit claiming for violent actions we need a system

[11] Although existing tools [49] could be employed to provide additional information on the geographic competition between violent non-state in their messages.

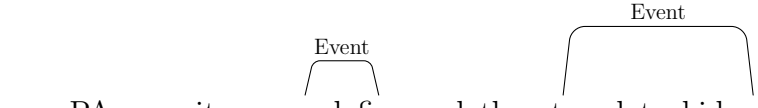
that can extract the specific issues that groups communicate about. Aspects are also coded with an additional attribute which specifies the type of aspect being represented. These attributes are objectives/means/events (OME). One way to distinguish these types is to think about various ways to write about the concept of peace. The general word peace, detached from additional information is an *objective*. On the other hand mentions of engaging in peace talks are a *means* that groups might engage in to establish peace. Finally, mentions of the Oslo Accords, a specific peace talk, represents an event. Being able to identify these variety of aspects will provide additional information on the breadth of communication from non-state groups. For example observing groups communicating about broader goals and means, rather than one off events, suggests their statements are being used for more than simply credit claiming.

2.4.2.1 Objectives Objectives are the most general form of OME. These should be abstract concepts that actors may aim to achieve or to undermine.

2.4.2.2 Means Means are actions that can be undertaken by groups to further political goals. Means should be more general than specific events.



2.4.2.3 Events Events are statements or accounts of specific actions. While the sentences below mentions "opening fire" and "kidnapping" which can be a means, the context of the sentences makes it clear it is talking about a specific instance of these aspects occurring, and thus they are events.

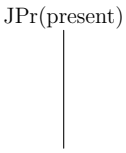


2.4.3 Judgements

Judgements represent how a given aspect is being spoken about. Identifying Judgements is crucial to evaluating the previously stated observable implications of battles over

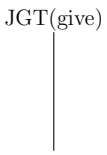
perceptions. Take two political actors in Palestine, Fatah and Hamas. Because the peace process with Israel is a salient issue, each of these actors are likely to discuss it. However, how each of these actors speaks about peace talks is likely to be very different, Hamas for example may be violently opposed. Without Judgements on a given aspect, capturing positional differences between groups is difficult. Similarly, within a single sentence a group may speak about multiple things, but take different positions on each aspect. Take the sentence "Hamas opposes peace talks and says that armed resistances is best for the cause." Reading the sentence it is clear that Hamas is taking two positions, opposition to peace talks, and support for armed resistance. Thus our model needs to be able to extract these fine grained distinctions, to better understand the array of judgements issues by groups.

2.4.3.1 Judgment, Presence or Absence (JPr) The JPr coding has two attribute (present) and (absent) these tags represent the presence or absence of a given aspect. Words such as "were", "are", "did" are common JPr words. In general if a word could be replaced with the word "did" while maintaining the meaning of the original sentence, it is likely to be a JPr word. Words that signal continuity or improvement such as "continue" or "improved" should also be coded as JPr, as these signal, sometimes implicitly the existence of some aspect.



Hamas Movement is very keen to establish calm and quite.

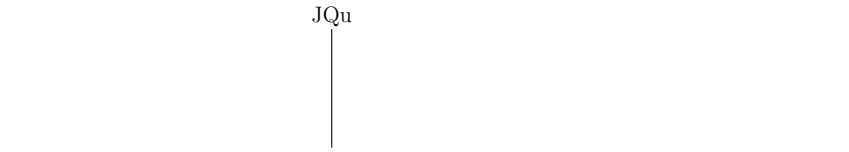
2.4.3.2 Judgment, Giving or Taking (JGT) The JGT has two attributes (give) and (take) which helps established if a given aspect (OME) is being extended or retracted. In the example below we see that Hamas is establishing calm and quite, the sentence would be very different if "establish" were substitute with "eliminate."



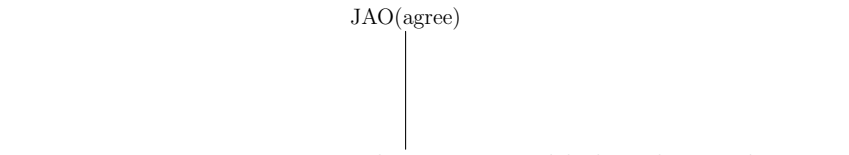
Hamas Movement is very keen to establish calm and quite.

2.4.3.3 Judgment, Quantity (JQu) JQu aims to measure quantities. In the simplest case it can be used to keep track of the number of things, for instance "launching 3 rockets."

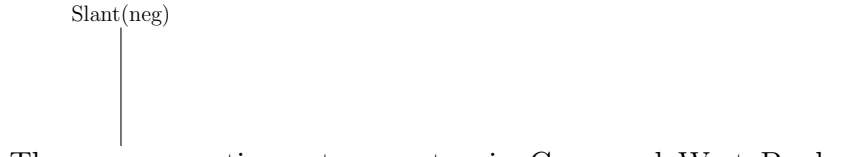
This can help to keep track of the scale of the activities groups engage in. More interestingly it can be used to emphasize support or opposition for a given aspect. The sentence below would be different if "very" were substituted with "somewhat."

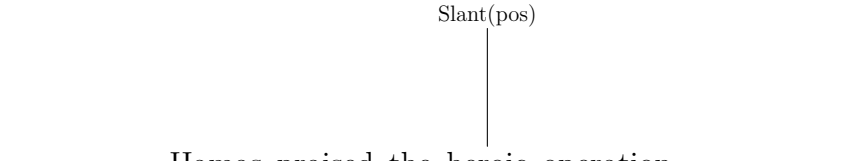


2.4.3.4 Judgement, Agree or Oppose (JAO) JAO aims to identify the words and phrases that signal a position is being taken within a sentence. JAO has two attributes (agree) and (oppose), that measure if the position is taken in support or opposition to some aspect or actor. This tag is fundamental for out ability to measure group's position taking.

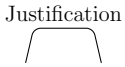


2.4.3.5 Slant Slant are instances where groups present information about an aspect or actor with added emotive language. The slant is akin to sentiment. Slant's have two aspects (negative) and (positive). Slants represent instances which while not strict position taking, do shed some light on a group's stated positions on other groups or aspects.





2.4.3.6 Connectors Connectors are a unique Judgement tag that are crucial to identifying the stated positions of group, and to allow long complicated sentences to be broken into smaller parts. Connectors have two possible attributes (justify) and (threat/warning). The justification attribute indicate a group is attempting to explain why they have carried out some action or taken some position. Commonly used justification words are "because", "due to" and "in response to." Threats/warnings are often framed in the future tense. For examples if X happens we will do Y, or if we allow group B to X it will be bad. This type of content allows groups to project their actions and positions into the future.



These actions come as a response to Israeli violations against Palestinians.

2.5 Extracting Annotations from Statements

To identify the presence of these tags within the statements released by violent non-state groups I first take the entirely of a corpus of statements released by Hamas's military wing and parse them into individual sentences. Sentences serve as readily identifiable units of text, that provide fine grained information about what is being discussed. Analyses at the document or paragraph may also be appropriate, but they aggregate over the available information. Given that our objective of interest is not a coarse low dimensional representation such as sentiment or a latent topic, we would be unnecessarily throwing away information.[12] After breaking each document into sentences a random sample are selected, written into a coding template, and annotated by human coders. Listing 2.1 provides an example of an annotation from a sentence released by Hamas. By writing a program to create this output, we can ensure that the structure will be consistent across sentences. This format can also be readily translated into a machine readable format to train the machine learning model described later. The coders simply fill in the words within the appropriate tags, separating each coded word with a comma. In this example "Al-Qassam-Bigades" is the clear *perp*, while the *OME* being carried out is "fired" and "Qassam-rockets", the actor being targeted (the *victim*) is then "Sederot." Currently, the model is trained on 1,300 sentences, though

[12]In fact the approach detailed below is actually conducted below the sentence level, as significant variation can be missed even at this level.

this number will increase with future iterations.

Listing 2.1: Sentence Annotation Example

```
1
2 <html>
3     <meta>
4         <actor>Hamas</actor>
5         <file>01_2008_HamStatement629.txt</file>
6         <number>2</number>
7         <year>2008</year>
8         <author></author>
9     </meta>
10
11    <sentence>Al-Qassam-Brigades fired two Qassam-rockets at Sederot</
          sentence>
12
13    <typology>
14        <JPr></JPr>
15        <JQu>two</JQu>
16        <JGT></JGT>
17        <JAO></JAO>
18        <slant></slant>
19        <Con></Con>
20        <OME>fired (event), Qassam-rockets (event)</OME>
21        <perp>Al-Qassam-Brigades</perp>
22        <victim>Sederot</victim>
23        <neg></neg>
24    </typology>
25 </html>
```

2.5.1 Supervised Learning Approach

However, while this coding approach is fairly straightforward, it does not scale especially well. For instance, the Hamas corpus contains well over one hundred thousand sentences. If you were to randomly sample 10 percent of the sentences and coded them each in thirty seconds it would take more than three days of contentious coding to complete the task. Further, this would provide data on only a single group. As noted before, there are also issues of consistency with purely human coded projects. Unfortunately consistency is not something that can be guaranteed by human coders, especially ones who have been coding for three days continuously. However, there is a middle ground which allows human coding to make the fine grained distinctions needed to evaluate the proposed theory, while maintaining consistency and scaling to larger numbers of sentences. This is done through the use supervised learning.

2.5.1.1 The Model We are left with the problem, that we have a given sentence and we would like to assign the correct tags to each word within the sentence. This task is commonly referred to as a sequence labeling problem. Table 6 provides an example of a sentence and the corresponding labels for each token. It is worth pointing out that this sentence may be one that was not coded by human annotators, so we can not simply rely on gold standard coding. Put another way the correct labels for this sentences are currently unknown. Thus we need a model, where given some new sentence of text it will return to us the correct labels. While there are potentially many algorithms which could be used for this problem, we will use Conditional Random Fields (CRF). CRF has been used widely for similar named entity problems, producing good results. As we detail later the model can learn a large number of flexible feature functions, producing good performance at the task. Additionally, unlike other approaches such as deep learning, the expectation is that CRF can produce good performance with a much smaller training set. Given the cost of producing our training data, and the lack of similar examples to conduct transfer learning, this consideration is important.

Table 6: Example sentence, the correct labels (in italic) are currently unknown to us.

Hamas	launched	rockets	at	Israel
(*Perp*)	(*OME*)	(*OME*)		(*Victim*)

$$p(\boldsymbol{y}|\boldsymbol{x};\boldsymbol{\lambda}) = \frac{1}{Z(\boldsymbol{x})} \exp(\sum_{i=1}^{n} \sum_{j} \lambda_j f_j(y_{i-1}, y_i, \boldsymbol{x}, i)) \tag{2.1}$$

The CRF is defined in Equation 2.1. The model is estimated by maximizing the conditional likelihood of the observed sequence of labels, given the observed sequence of words. This requires iterating through each element of a given sequence $\boldsymbol{x}$ and through each feature function $f_j(y_{i-1}, y_i, \boldsymbol{x}, i)$. Where $Z(\boldsymbol{x})$ is a normalization factor which insures the values are proper probabilities and sum to one.

2.5.1.2 Feature Functions Because CRF learns the context of a given set of words, the features of the model are actually feature functions. For the simplest case, the linear-chain CRF, a feature function can be represented as $f_j(y_{i-1}, y_i, \boldsymbol{x}, i)$. Here $\boldsymbol{x}$ denotes a vector of

text, in our case an entire sentence. i then indexes our position in the sentence. y represents the label either of index i or the label of the preceding index $(i-1)$. The label here would be one of the tags detailed above. For a more concrete example, imagine a model where we aim to predict if a given word is a Perpetrator or not (1/0). Two example features functions are shown below. Here the NNP for x_i means that the given word is a proper noun, and that the following word is a verb (VB). If this pattern is present, then the feature function is said to be active. Because this feature function would then likely have a positive parameter estimate, it would increase the likelihood that a given word would be labeled as a Perpetrator. The process is repeated for each word and each feature function.

$$f_1(y_{i-1}, y, \boldsymbol{x}, i) = \begin{cases} 1, & \text{if } x_i = \text{NNP and } x_{i+1} = \text{VB} \\ 0, & \text{otherwise} \end{cases} \tag{2.2}$$

$$f_2(y_{i-1}, y, \boldsymbol{x}, i) = \begin{cases} 1, & \text{if } x_i = \text{NNP and } y_{i-1} = \text{Perp} \\ 0, & \text{otherwise} \end{cases} \tag{2.3}$$

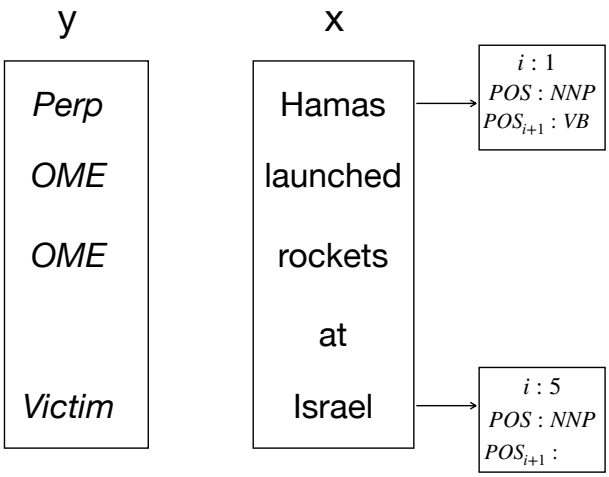


Figure 1: Example of information used in CRF feature functions.

The CRF is a useful and powerful model for two reasons. One feature functions can provide information at a variety of levels. In the models here we use the part of speech

tags for a given word, as well as the words directly before and after. Other features denote if a given token is a digit (likely useful for predicting JPr tags). Still other features detail sub-character information, such as the ending of a given tokens. Beyond the variety of information the model can use to create feature functions, the real work is done by the model identifying feature functions that might not have been obvious beforehand. By using large quantities of feature functions, the model can potentially pick up a variety of signals. To prevent overfitting regularization is used so that most of the parameter estimates for the feature functions are near zero.

2.5.1.3 Model Estimation and Inference Fitting these model however requires us to estimate $\boldsymbol{\lambda}$, the weights for a given feature function. In practice these weights are estimated using standard penalized maximum likelihood. To do this we must have a set of n coded training examples, $(\boldsymbol{x^i}, \boldsymbol{y^i})$ More specifically we aim to find $\boldsymbol{\lambda}$ such that the conditional likelihood of the training data is maximized.

$$\lambda_j = \sum_{i=1}^{n} \log p(\boldsymbol{y^i}|\boldsymbol{x^i}) - \sum_{j=1}^{J} \frac{\lambda_j^2}{2\sigma^2} \tag{2.4}$$

To avoid overfitting the $\frac{1}{2\sigma^2}$ represents the commonly used l_2 norm and is included to penalize more complex models. The strength of this regularization is determined by the value of σ, which can be set by the user or tuned using cross-validation. These parameters are tuned through gradient based approaches, where the initially assigned λ values are updated until the changes in the model approach zero. Using the fitted model we would like to be able to make inferences as new sentences arrive. These $\hat{Y}$ values for a given word can be efficiently computed using the forward–backward algorithm/Viterbi algorithm.

2.5.1.4 Evaluating The Model Before detailing the evaluation metrics used it is worth defining some terminology. The predictions made from binary classification can be represented as four distinct types, true positives (TP), false positives (FP), true negatives (TN) and false negatives (FN). Table 7 displays how these types of classifications fit into the confusion matrix,

Table 7: Confusion matrix.

	Observed 1	Observed 0
Predicted 1	TP	FP
Predicted 0	FN	TN

Accuracy, perhaps the most widely used evaluation metric, compares the number of examples correctly predicted, relative to the total number of predictions. While accuracy is intuitive, for prediction problems that are class imbalanced (there are many more samples of one outcome than other) it can create a false sense of confidence in a model's ability. For instance if we see that a model has 95% accuracy, we might think this is a great model. However, what is 96% of the samples were labeled 0? A competing model that naively always predicted 0, would actually perform better than our model. To better contextualize the accuracy metric I also include the accuracy for a model that always predicts the majority class (Base Acc.).

$$\text{Accuracy} = \frac{(TP + TN)}{(TP + TN + FP + FN)}$$

Precision represents the correct number of positives the model predicts (FP) divided by the total positive predictions the model makes (TP + FP). This measures how many of a model's positive predictions are actually positive. The recall represents the correct number of positives the model predicts divided by the total positive values in the data (TPs are the 1s the model predicts correctly, while FNs are values the model predicted as 0, but are actually 1's). Both measures highlight different modeling concerns, precision the cost of FPs, and recall the cost of FNs.

$$\text{Precision} = \frac{TP}{TP + FP} \quad \text{Recall} = \frac{TP}{TP + FN}$$

The F_1 measure provides a balance between precision and recall, allowing the measure to account for both FP and FN. For classification tasks with high class imbalance, such as those undertaken here, the F_1 measure provides an added benefit. Because F_1 does not

consider TN, unlike accuracy, the measure will not be overwhelmed by correct predictions of the majority class.[13]

$$F_1 = 2 * \frac{\text{precision} * \text{recall}}{\text{precision} + \text{recall}}$$

Table 8: Out-of-sample model evaluation metrics across tags. The metrics used are Accuracy, Precision, Recall, and F1. Base Acc. denotes the accuracy of a model always predicting the majority class. Label(1) denotes the number of observations where the label is coded 1 (the presence of that tag).

Tags	Acc	Prec	Recall	F1	Base Acc	Label(1)
JPr(P)	.99	.96	.95	.96	.97	145
JGT(G)	1.0	.78	.65	.69	1.0	17
JGT(T)	1.0	.93	.66	.73	1.0	19
JAO(A)	1.0	1.0	.82	.89	.99	50
JAO(O)	1.0	1.0	.84	.90	.99	28
Slant(N)	1.0	.96	.71	.78	.99	34
Slant(P)	1.0	.75	.67	.70	1.0	3
Justify	1.0	.90	.88	.89	.99	45
OME(E)	.96	.90	.84	.87	.91	385
OME(M)	.96	.80	.64	.69	.95	215
OME(G)	1.0	.50	.50	.50	1.0	8
Perp	.96	.91	.85	.87	.91	391
Vic	.94	.87	.82	.84	.90	439
Neg	1.0	.94	.90	.92	1.0	10
JQu	-	-	-	-	-	-

Table 8 displays the out-of-sample evaluation metrics for each of our tags. In general we see that we were able to produce good performing models for most of the tags. Future work

[13]The value of F_1 depends on the threshold that is used to convert the predicted probabilities generated from the model into classifications of either 0 or 1. For this task tags with predicted probabilities higher than .5 are classified as 1.

will aim to code more sentences to further improve the performance, focusing on the JGT, and OME tags.

2.5.1.5 Adding New Sentences and New Groups After training the model on initial examples we can also use an active learning based approach to more effectively locate sentences to be coded. The aim is to locate sentences which will provide he most additional information for our model. Fortunately, the work of Claude Shannon, provides just such an approach, based around the measure of entropy. Entropy provides a measure of the surprisal of finding out $x_i = 1$.

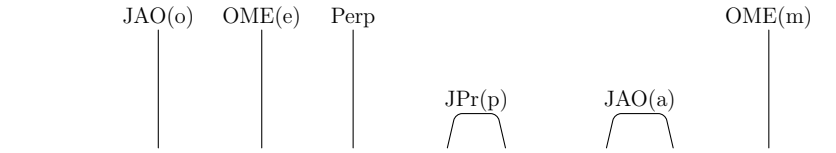
$$\mathrm{H}(X) = -\sum_{i=1}^{n} P(x_i) log_2 P(x_i)$$

Having higher surprisal (entropy values) means there is information in observations that is not already contained in the model. For binary predictions the entropy is minimized when the predicted class is sharp, formally, $\lim_{x \to 1} -log_2(x_i) = 0$ and maximized where $p(x_i = .5)$. This provides the entropy of a single tag, the entropy of a given sentence can then be obtained by summing over the individuals tag entropy values and dividing by the number of tags. This active learning based approach is also advantageous as new groups are incorporated into the model. Rather than having to start from scratch, by locating the sentences from a new corpus with the most new information, we can more efficient produce a model that generalizes to a new context.

2.6 From Tags to Strategies

We now have a system which can accurately extract the relevant annotations from the messages of violent non-state groups. However, these individual tags are only the building blocks of the larger strategies detailed in earlier chapters. In particular we want to connect these currently disparate pieces into meaningful compounds which can tell us not only that a position is being taken, but what the position is, and who is making the claim. To further illustrate the goal we return to a previous sentences, now with all of the annotations labeled. To make within and between group comparisons we want to be sure that the relevant components are properly connected. In this sentence for example we want to extract that the

actor Hamas is opposed to an event, while they support another means. This also reinforces the need to go below the sentence level of analysis. With the model we have already developed we could identify the presence of words that signal two distinct judgements, one in support of a aspect and one against another aspect, but we need a systematic means of connecting the aspects and the judgements. Simply pooling all the JAO words and all the OME words would mix up that "Oslo" is being opposed, while "elections" are being supported. Fortunately the Natural Language Processing (NLP) community has spent considerable efforts developing tools which can aid in our task, namely through the use of dependency parsing.



2.6.1 Dependency Parsing

To extract not only the discrete aspects, actors, and judgements in the statements of violent non-state groups, but the connections between these words, we will make use of an existing technique, dependency parsing. For our analyse we will use the existing dependency parsing tools released as a part of Stanford's Stanza package [119], specifically CoreNLP's enchancedDependencies [95, 129]. Dependency parsing aims to capture the grammatical relationships within a sentence. These annotations are presented as edges between two words, along with the grammatical relationship they represent.[14] Table 9 shows the dependency parse for a previous example sentence. The point here is less the specific roles assigned to given words, and more that the relevant connections in the sentence are there. For our purposes we see that Hamas, the perpetrator, is part of the subject of the sentence and is connected to the OME that is being carried out. Specifically, Hamas is directly connected to "fired", which is then connected to the other OME "Qassam-Rockets." We also see that fired is connected to "Sederot," the victim, allowing us to extract not just that rockets are being fired but who they are being fired at. Finally, two, the JQu, is correctly connected to "Qassam-Rockets" telling us the quantity being fired. While this detail is not necessary to

[14]Greater detail on the wide variety of grammatical relationships captured can be found here `https://nlp.stanford.edu/software/dependencies_manual.pdf`

extract the strategy being used, it can still be interesting information for researchers aiming to compare the scale of various activities across groups. Similarly, a researcher might sum JQu tags across each OME within a given time point to look at the total number of reported activities.

Table 9: Example sentence, the assigned labels are in italic.

Hamas	fired	two	Qassam-Rockets	at	Sederot.
(*Perp*)	(*OME*)	(*JQu*)	(*OME*)		(*Victim*)

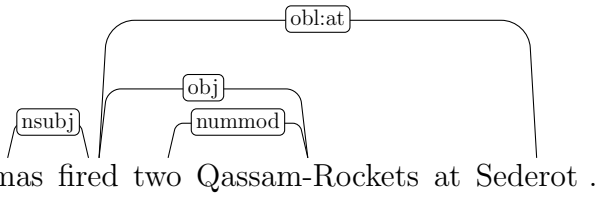


Figure 2: Dependency parse for the sentence in Table 9. The arrows connect words with dependent relationships, while the boxes over these edges denote the relationship.

With a basic understanding of dependency parsing, we will now build on these tools to extract evidence of strategies at the subsentence level. First we need to think about a dependency parse not just as a flat structure such as that presented in Figure 9, but a directed network, where nodes at descending levels of the graph are connected to nodes at higher levels. Here the dependency parse forms the edges of this graphs and provides a natural hierarchy. Figure 9 is presented in this format below. Notice that nothing has changed in the composition, only the presentation format. This graphical form can be useful to conceptualize and visualize sentences as collections of related but distinct actors, aspects and judgements.

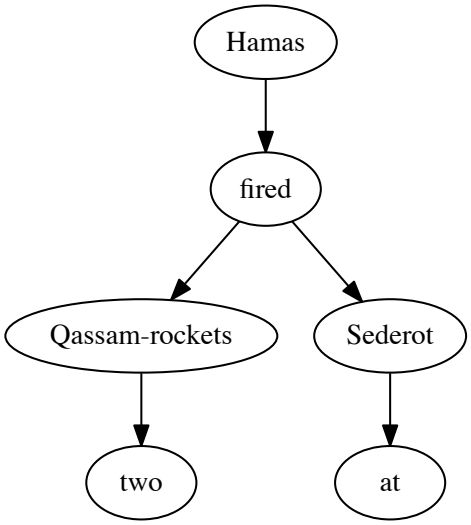


Figure 3: Graph of the dependency parse of the sentence in Table 9.

2.6.2 Approach

Using the results of the dependency parse as the foundation, the goal will be to first extract the unique signatures of given strategies from within the sentences. After identifying these unique pieces we will then reconnect important information such as the perpetrator of the given action, as well as the victim these actions are being aimed at. The following sections will detail these approach, and provide a series of examples.

Example Sentence 1.) "The Islamic resistance movement Hamas praised the "heroic" operation."

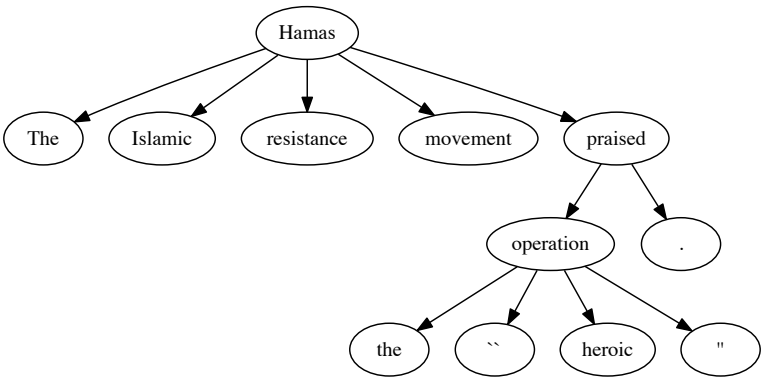


Figure 4: Graph of the dependency parse.

2.6.2.1 1.) Keeping Relevant Words This step simply involves removing edges which do not contain meaningful information for the approach. This includes punctuation, articles, and other stop words. This also has the effect of making the the relevant components easier to visually inspect. Notice that the structure of the sentence has not changed, we have mostly just trimmed nodes from the deepest leaves of the graph.

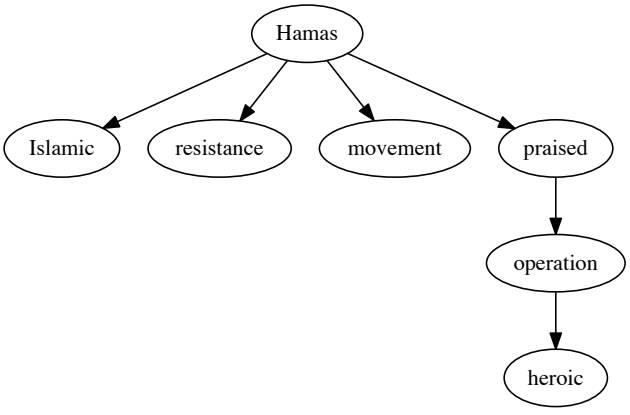


Figure 5: Directed Dependency network, with only relevant nodes retained.

2.6.2.2 2.) Separating Perpetrators and Victims The next step is to separate the actors from the actions being carried out. Because each nodes has been assigned tags by our

model, this process is carried out by removing edges between nodes which have been coded as either Perpetrator or Victim. For complicated sentences where there are multiple actors, this further serves in unnesting the sentence so that aspects and judgements can be correctly assigned. In this example we are left with two subgraphs, one which lists a long form name of the group Hamas, and another which potentially contains the aspects and/or judgements.

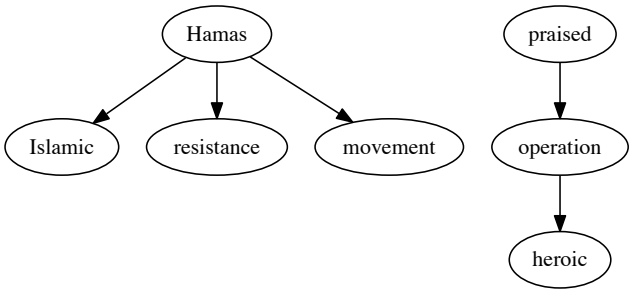


Figure 6: Directed Dependency network, after removing the edges between actors.

2.6.2.3 3.) Separating Justifications The next step involves removing edges between nodes that signal a justification is being issued (again coded based on our typology). The goal is to separate the justifications from the actions that are being justified. In general these sentences tend to take the form "we did this", "because (justification)", "they did this." Splitting on the justification then allows us to separate the two actions taking place. As this example sentence contains no justifications, the sentences is unchanged.

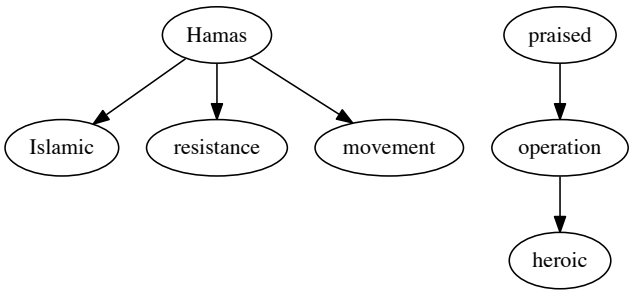


Figure 7: Directed Dependency network, after removing the edges between justifications.

2.6.2.4 4.) Detecting Subsentences Strategies Now that the original sentence has been sufficiently broken into it's constituent pieces, the goal is to identify the pieces of evidence for the various strategies. Because we have broken the sentences down to these fine grained pieces, and developed a typology for specific evidence of the various strategies, a simple rule based approach can effectively classify the subgraphs. The approach begins by iterating through each of the subgraphs. The subgraphs are represented as $G_i \in \{\text{OME, JAO, Vic, Perp} \ldots\}$, a vector containing the coding for the various words in a given subgraph. For each subgraph we also initialize an empty string, $S_i =$ "", which will be filled with the corresponding strategies for a given subgraph. In each iteration we will check the conditions listed below, and add the corresponding strategies to S_i. This allows for a given subgraph to contain multiple roles, for instance both a Slant, and a Position Taking.

Position Taking

$$S_i = \begin{cases} S_i \mathrel{+}= \text{Position Taking}, & \text{if } G_i \ni \text{JAO} \\ S_i, & \text{otherwise} \end{cases} \tag{2.5}$$

A given subgraph is labeled Position Taking if the subgraph contains a word labeled JAO(agree) or JAO(oppose). If no JAO is present the original string S_i is returned

Justification

$$S_i = \begin{cases} S_i \mathrel{+}= \text{Justification}, & \text{if } G_i \ni \text{Con (justify)} \\ S_i, & \text{otherwise} \end{cases} \tag{2.6}$$

A given subgraph is labeled Justification if the subgraph contains a word labeled justify. If no justification is present the original string S_i is returned

Credit Claiming

$$S_i = \begin{cases} S_i \mathrel{+}= \text{Credit Claim}, & \text{if } G_i \ni \text{OME and JAO} \notin G_i \\ S_i, & \text{otherwise} \end{cases} \tag{2.7}$$

A given subgraph is labeled Credit Claiming if the subgraph contains an OME and does not contain a JAO, a position. If no Credit Claim is present the original string S_i is returned. Note that this is a very inclusive definition of credit claiming. A more narrow definition might require the OME words to be in the past tense, so that credit claims could only be made for actions that have already taken place. However, for now it is most important to be able to distinguish between actions that are clearly position taking and those that are not. This approach also provides a tough test of alternative explanations, because a sentence such as "We will continue the fight." would be labeled as a credit claim, as there are no clear positional words in the sentence, even though the sentence is really about what a group will be in the future.

Slant

$$S_i = \begin{cases} S_i \mathrel{+}= \text{Slant}, & \text{if } G_i \ni \text{Slant} \\ S_i, & \text{otherwise} \end{cases} \tag{2.8}$$

A given subgraph is labeled Slant if the subgraph contains a Slant. If no Slant is present the original string S_i is returned.

Classifying Subgraphs in Example 1

We now return to our example sentence "The Islamic resistance movement Hamas praised the "heroic" operation." Step 3 shows there are two subgraphs. The first simply contains Perpetrators, thus it would would not meet any of the conditions in Step 4, and thus does not contain information on a strategy. The second subgraph contains a JAO(agree), "praised", an OME, "opperations", and a slant(pos), "heroic." Thus based on the approach laid out in Step 4, this subgraph would be an example of Position Taking, along with a Slant (pos).

2.6.2.5 5.) Connecting Perpetrators and Victims We now have the strategies for each subgraph, however it would provide more information if we knew which actors were engaging in these strategies as well as who they were directing them towards. This is done by first taking all the subgraphs which contain strategies. In Example 1, this is only the rightmost subgraph in Step 3. From there we find the top and bottom nodes in the subgraphs, in this case "praised" and "heroic." Actors are attached by returning to the full connected

network in Step 1. Perpetrators are attached by looking for incoming edges that are attached to the word at the top of the subgraph ("praised"). If the income edge is connected to a perpetrator, that actor is placed at the top of the subgraph. These incoming edges tend to indicate an actor carrying out an act (often as the subject of the sentence.) In our sentence, we see that "Hamas" is connected to "praised" and thus is assigned the Perpetrator of that subgraph. For victims we conduct the opposite approach. Here we locate the bottom-most node in the subgraph ("heroic") and check it for outgoing edges. Words connected by outgoing edges and coded as Victims are then assigned as the victim of that subgraph and added to the bottom of the graph. In our example here there are no outgoing edges from "heroic" (and no victims coded in the sentence) so the subgraph has no victims. The use of incoming and outgoing edges may seem unnecessarily given that the words in the graph are already tagged as Perp or Victim. However, because the same node can be both a Victim and Perp, without a means to differentiate it is possible to scramble the actors. For instance, take the sentence "Qassam Brigades targeted the military vehicles and Zionist-soldiers who invade east of Rafah city." Here "military vehicles" and "Zionist-soldiers" are both Perpetrators who are "invade", and Victims being "targeted" by "Qassam Brigades."[15]

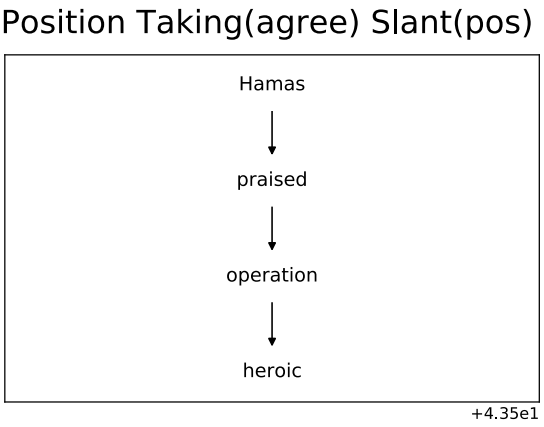


Figure 8: Graph of the strategy from each subgraph, with attached perpetrators and victims.

Returning to Example Sentence 1, Figure 8 shows the final outcome of the approach.

[15]However, this approach is not perfect, the next section details some issues with assigning Perp and Victim.

The single subgraph which contained a strategy is correctly labeled as Position Taking, with a positive Slant. Additionally, the actor taking the position, Hamas, has been correctly added at the top of the subgraph. From here we can output all the underlying data used to make the plot. That includes the overall strategy labels, the directed network, as well as a dictionary which ids the annotations for each of the nodes in the network.

Example Sentence 2.) "In response to Al-Zaytoon massacre, Al-Qassam-Brigades targeted the Zionist-forces and the Zionist-settlements"

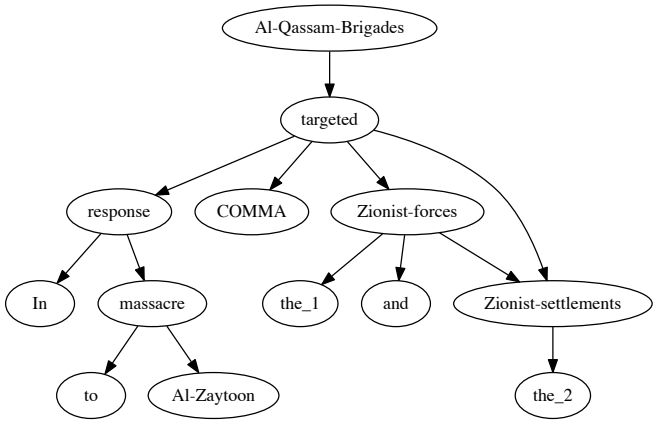


Figure 9: Graph of the dependency parse.

2.6.2.6 1.) Keeping Relevant Words See figure.

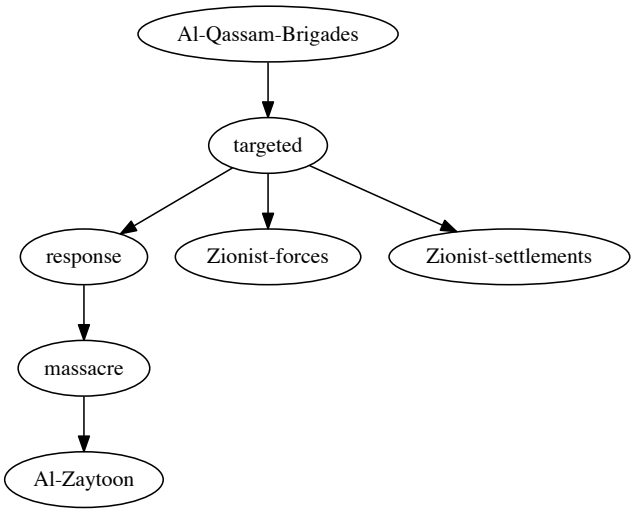


Figure 10: Directed Dependency network, with only relevant nodes retained.

2.6.2.7 2.) Separating Perpetrators and Victims See figure.

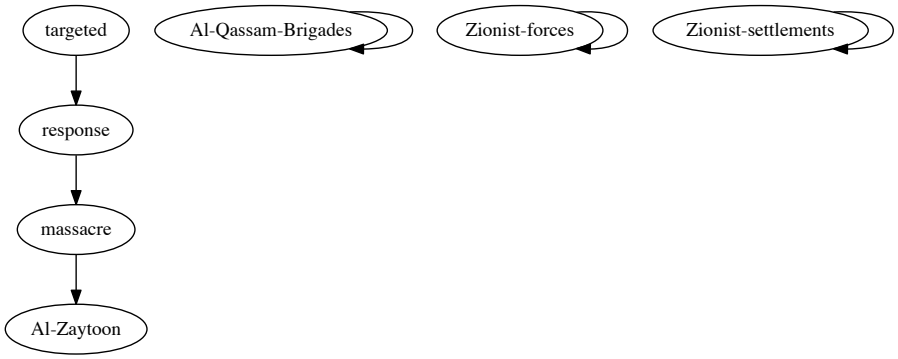


Figure 11: Directed Dependency network, after removing the edges between actors.

2.6.2.8 3.) Separating Justifications

See figure.

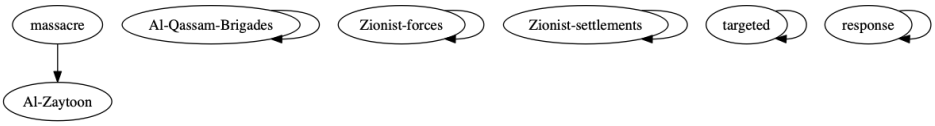


Figure 12: Directed Dependency network, after removing the edges between justifications.

2.6.2.9 4.) Detecting Subsentence Strategies

We have now broken the sentence into its constituent subgraphs. In total we have six subgraphs, each are then checked against the conditions laid out in Step 4.). The first subgraph contains two OMEs and is thus labeled Credit Claiming, subgraphs two through four are actors, and thus have no strategies assigned. Subgraph 5 is a single OME, and is thus labeled Credit Claiming. Finally, subgraph six is coded as con(justify) and is thus labeled a Justification.

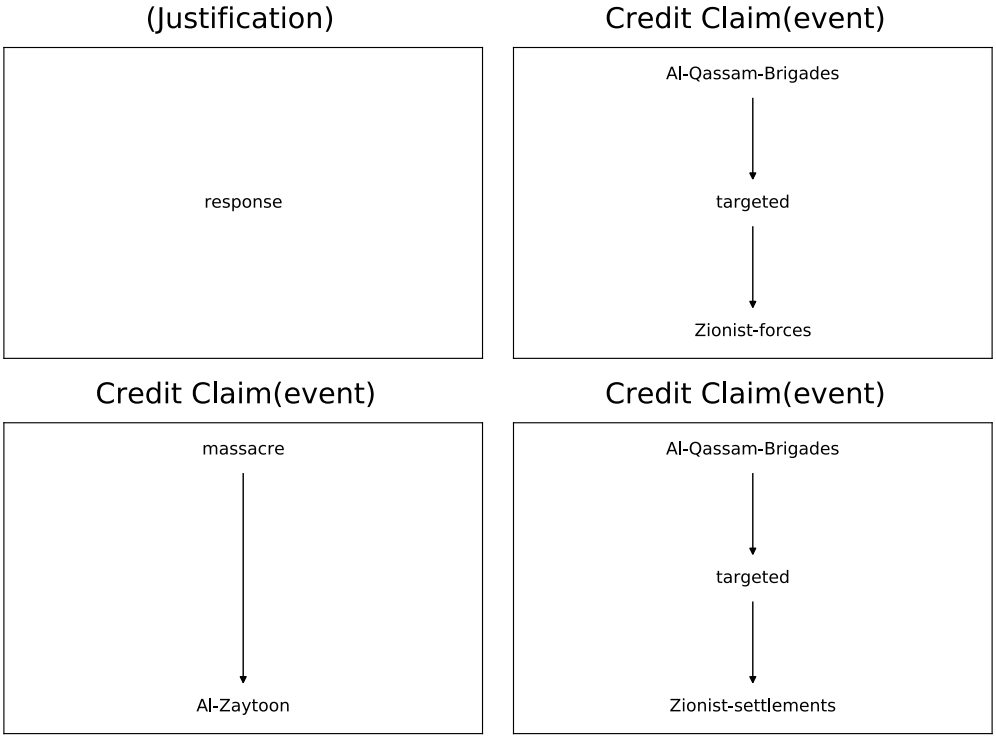


Figure 13: Graph of the strategy from each subgraph, with attached perpetrators and victims.

2.6.2.10 5.) Connecting Perpetrator and Victims Again we aim to connect the relevant actors with the given actions.[16] Notice that while there were only three subgraphs which contained strategies in Step 4, but there are four outputs in Step 5. This occurs because "Al-Qassam-Brigades" are "targeting" both "Zionist-settlements" and "Zionisit-forces." The approach is able to correctly assign the actions to both victims. Finally in Figure 14 we return to the original sentence and annotated the constituent strategies within in.

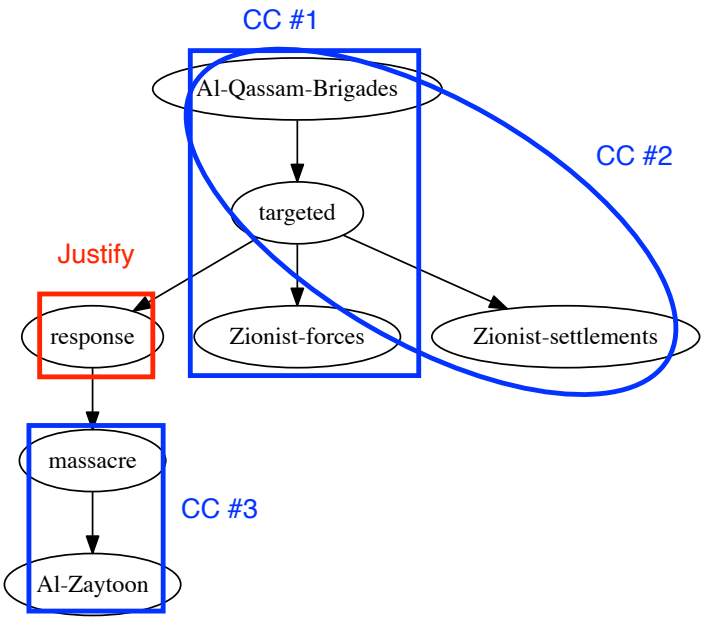


Figure 14: Directed Dependency network with strategies annotated.

2.6.3 Sources of Error and Areas for Improvement

However, we should not pretend that the approach presented here is perfect. In fact, there are four potential sources of error, two reducible and two large irreducible by the researcher. The reducible source of error is found in the CRF model used to classify the tags for given words in a sentence. Since the procedures to identify unique strategies rely on correct

[16] At this stage Justifications are not assigned actors as it actually represents a connection between two things. Further work will aim to correctly order the actor/actions which are being justified, and the response action

annotations, inaccuracy there will effect the final outcome. Fortunately, we have assessed the out-of-sample accuracy and find the models do perform well. However, the accuracy of the models can be further improved by coding more training data and investigating the sentences that are predicted incorrectly, in order to develop new features [25]. Second, while the assignment of strategies is highly effective, the assignment of Perp and Victims to the given subgraphs does produce some errors. The most common error is when the final node in a subgraph is not connected to the relevant Victim in the subgraphs. A more general check for connections between Perps and Vic in a given subgraph is in progress.

The first largely irreducible error is that occasionally the authors write grammatically incorrect sentences. This in turn leads to incorrect dependency parses, which impacts future stages of the analysis. Fortunately, relative to the total volume of text, these types of errors are infrequent. Unfortunately, fixing these errors is a task that has to be conducted manually, as existing spelling and grammar checking programs produce a very high number of false positive corrections, due to the specialized vocabulary used by these groups. Second, the dependency parser occasionally produces results which are imperfect. This may be due again to the specific nature of the text. However, again this types of error are infrequent.

2.7 Measuring Variety and Complexity of Messaging

Using the output of the approach detailed above we are able to make a number of inferences about how groups engage in message, and evaluate the evidence for the proposed theory, and alternative explanations. Before directly evaluating these theories however, we also carry out a test which can assess the complexity of the messages groups release. This is done by looking at the depth of the dependency parse, describe in Step 1 of our approach. Observing that sentences contain deeply nested networks, suggests more complex arguments are being made by the group. These more complex arguments in turn are more costly to create, and provide further evidence against these messages simply being cheap talk. Importantly the depth of the dependency parse is not simply determined by sentence length. A sentence which simply listed many item would be shallow relative to a shorter sentence, that claimed credit and provided a justification for a single actions.

The first analysis evaluating the content can be conducted by aggregating the labeled

strategies across all the sentences in a given period of time. For a given group we could compute the proportions each strategy is used across their messages. These broad strategies correspond directly to the ambiguities of violence laid on in the theory section. For instance, credit claiming, reduces the ambiguity of the perpetrator, while credit claiming across a variety of actions (not just violence) helps clarify the ambiguity of a group's actions. Position taking reduces the ambiguity of a group's goals, while justification are one means of connecting a group's expressed goals and actions

This also allows us to evaluate the evidence for the alternative explanations. If we observed that a group engages in not only credit claiming, but also position taking, this is evidence against the Only Attention alternative explanations. The implication here is that group's are using messaging for political purposes outside of just gaining attention. Further, observing that a group is not simply taking extreme positions, is evidence against the Extremism alternative explanation. One piece of evidence is groups providing justifications for their violence, this is an implicit acceptance that violence has costs, that need to be mitigated, rather than being the sole tactic used to compete.

In addition, by identifying observation where the perpetrator is not the group authoring the statement, but one of their rivals, we can assess how the group speaks about their competitors actions and positions. Because groups are competing, there is an expectation that they will not only promote their organization but also denigrate rivals.

2.8 Measuring Messaging as a Compliment to Violence

To evaluate the expectation that messaging will be used as a compliment to violence we use the Integrated Crisis Early Warning System (ICEWS) event dataset as the source of data for violent actions carried out by non-state groups [110, 18].[17] ICEWS is a DARPA-funded initiative which codes events from hundreds of newspaper sources. ICEWS covers the years 1999-2020. For our analysis we select event between 2007 and 2016, to match the dates covered in the Hamas statement data. We select events where Hamas is the source (the actor carrying out the event). The names of the group are standardized so that alternative

[17]The ICEWS data and codebook can be found here-
https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/28075

names (Hamas Movement, al-Qassam Brigades) are captured as the same entity. We match the CAMEO code of each event to its QuadClass[18] so that each event is coded as either neutral, verbal cooperation, material cooperation, verbal conflict, or material conflict. The relevant data for this comparison are the events which are labeled as material conflict. The expectation is that we will observe a positive correlation between the number of violent events, and the volume of messaging.

[18]We use the example provided by the Open Event Data Alliance- `https://s3.amazonaws.com/oeda/docs/phoenix_codebook.pdf`

3.0 Evidence for the Battle Over Perceptions

Having proposed a theory detailing the necessity of messaging for violent non-state groups to mobilize support, and provided a novel research design to evaluate the evidence for this theory, this section evaluates the evidence for our theory, as well as alternative explanations. We begin by demonstrating that existing approaches are too coarse to evaluate our theory. We then present a series of results with provide new insights into Hamas's communication strategy, detailing the issues they support, as well as the issues they claim their competitor, Israel, supports. The key takeaway being that Hamas claims to support a variety of non-violent actions, while frequently claiming that Israel supports violence. Without attaching the perpetrators, aspects, and position on aspects within the text other approaches might concluded that Hamas overwhelmingly messages about their own violence. Finally, using events data along with our messaging data we show that messages are used alongside violence, serving as a compliment rather than a substitute.

3.1 Results for Existing Approaches

In this section we present the results conducted using existing off-the-shelf methods. While we expect these methods to be too coarse to be able to evaluate the evidence for battles over perspectives, highlighting these shortcomings reinforces the need for our more intensive research design.

Table 10: NMF topic results.

Topic	Prop.	Top 5
19	.11	peace, report, rights, palestinians, war
11	.10	zionists, years, zionist_soldiers, men, army,
0	.09	khan, area, reported, injured, palestinian
14	.08	town, citizens, raided, stormed, sources
15	.07	said, blockade, rafah, egypt, convoy
2	.07	resistance, said, reconciliation, political, pa
10	.07	movement, martyr, mourned, al_qassam_brigades, islamic
18	.06	months, center, children, court, hunger_strike
7	.05	identified, town, mohammad, bank, west, al, khalil, invaded
16	.04	units, settlement, construction, palestinian, demolition
1	.04	aggression, strip, date, west, bank
4	.04	occupation, deal, prisons, israeli, palestinian
9	.03	bombs, shot, dozens, coated, tear
12	.03	settler, jewish, israeli, palestinian, trees
8	.03	west, area, committee, settlements, activists
3	.03	commitment, belligerent, reaffirms, martyred, ezzedeen
5	.02	jewish, muslim, foundation, sheikh, worshipers
13	.02	qassam_brigades, martyred, al, jihad, allah
6	.01	qassam, fired, qassam_brigades, ezzedeen, operation
17	.01	opened, palestinian, gaza, israeli, miles

Table 10 displays the top 5 words for each of the 20 topics from the NMF model. The topics are ordered based on their overall occurrence within Hamas statements. This result highlights several limitations of conventional topic model based approaches for understanding the communication strategies employed by violent non-state groups. Take Topic 19, the topic that appears with the highest proportion in the text. In this topic we see both the words

"peace", and "war." From a clustering perspective, it makes sense that these words would occur in similar contexts, and thus be featured in the same topic. However, semantically the words are opposites. Thus while observing that a given sentence is about Topic 19, might tell us it is generally about conflict in Palestine, it would not tell us if Hamas supports war or if Hamas is saying that Israel does. This coarseness hinders our ability to make cross group comparisons about the activities they carry out. We also see topics which feature multiple actors, such as Topics 4 and 17. While these words plausibly co-occur, the model does not identify the role these actors are playing. For instance, Topic 4 seems to generally deal with prisoners, but are they Israeli prisoners or Palestinian prisoners? The same issue emerges in Topic 17, this topic is generally about marine activity, but the perpetrators and/or victims are ambiguous. While prior knowledge or a close reading of the documents can help clarify these issues, that information is not passed directly to our analysis, potentially leading to ad-hoc explanations of the meaning of words in a topic. Further, these cluster are detached from the underlying strategy being employed by the group. This is particularly important because while two groups might both discuss violence, one may point out the violence they carried out, while the other states that they are opposed to violence. Topic 9 provides a good example of this, are these instances of Hamas claiming credit for their violence, or criticizing the violent acts carried out by other actors? This vagueness has a direct effect on our ability to measure the purpose of a given message, which in turn stifles future attempts to evaluate how and why some messages are more effective. We can not evaluate a group's strategies, even in broad terms, if we are given only a word, detached from the group engaging in the activity, and their possible position on this action. To be clear, the point is not that topic models are hopelessly flawed, but rather that to extract the information we need to assess the evidence for battles over perceptions, we are simply asking too much of the bag-of-words representation.[1] In some ways it is obvious that if you strip a word of its context and connections, you are then unable to use this information for analyses. Perhaps less obvious is that when we make the choice to use simpler representations of textual data,

[1]Further it should not be overlooked that other work has aimed to move beyond bag-of-words representations [143, 50, 112]. This has led to increased predictive performance and more interpretable features. However, because these approach do not solve the problems detailed here, they are not discussed here in detail.

we are also limiting the types of questions we can effectively address. Figure 15 plots the proportion of the sentences represented by a given topic for each month in the data. While this figure can not clarify the issues pointed out above, it may hint at dynamics within Hamas's messaging. Topic 6 for instance seems to focus almost entirely on conflict between Hamas and Israel which began after Hamas killed two Israel soldiers and captured solider Gilad Shalit. Similarly, we can see some information about the salience of issues over time. For instance, Topics 18 and 14, show a steady increase starting around 2009. The focus on actors such as "prisoners", "children", and "hunger_strike" in Topic 18, and words such as "raided" and "stormed" in Topic 14 suggests increased tensions, and material conflict. However, the actor carrying out these actions is unclear. Overall, while the aggregation of the topic model makes more exact inferences difficult, it does point out a variety of actors and actions under discussion in Hamas's messages.

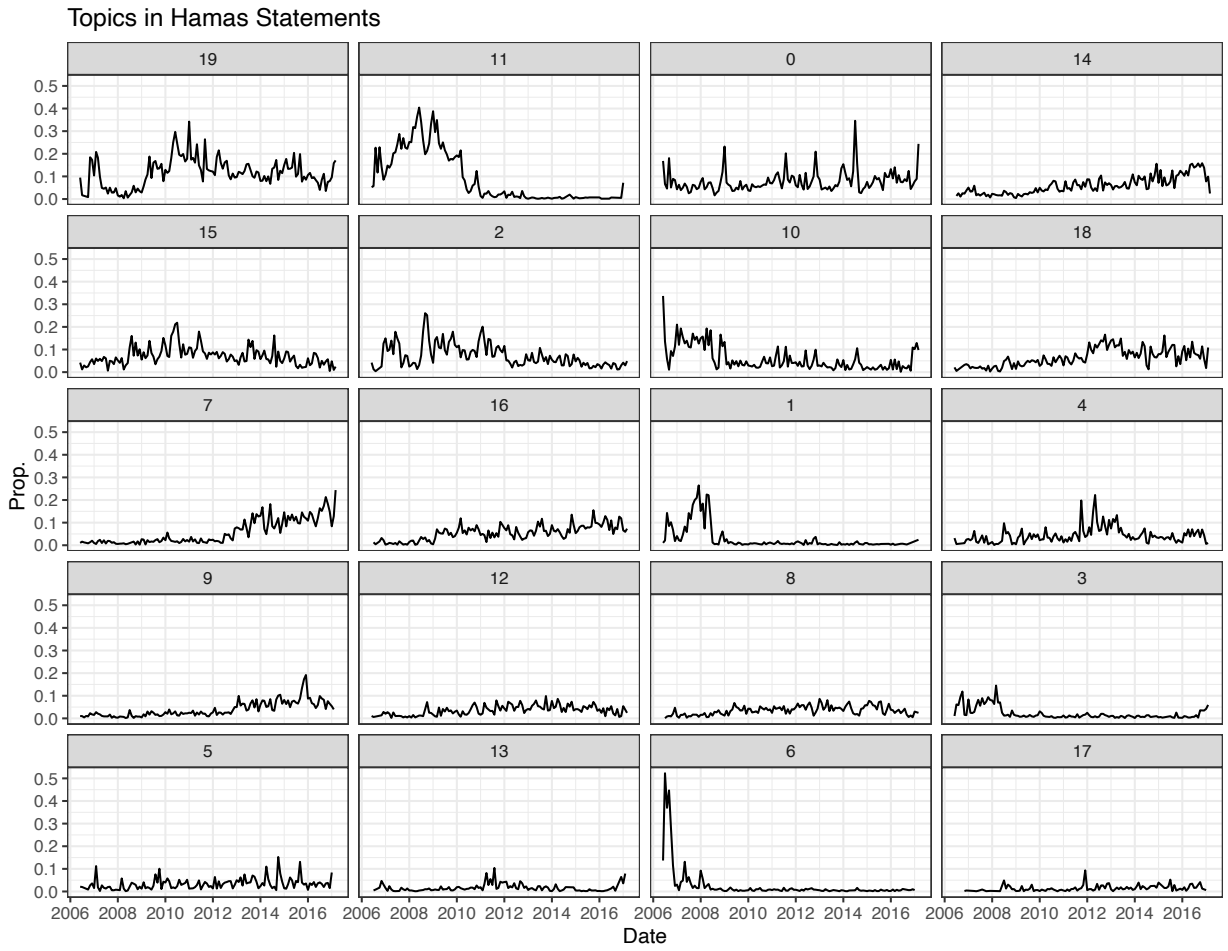


Figure 15: The proportion each topic is used monthly in Hamas's messaging.

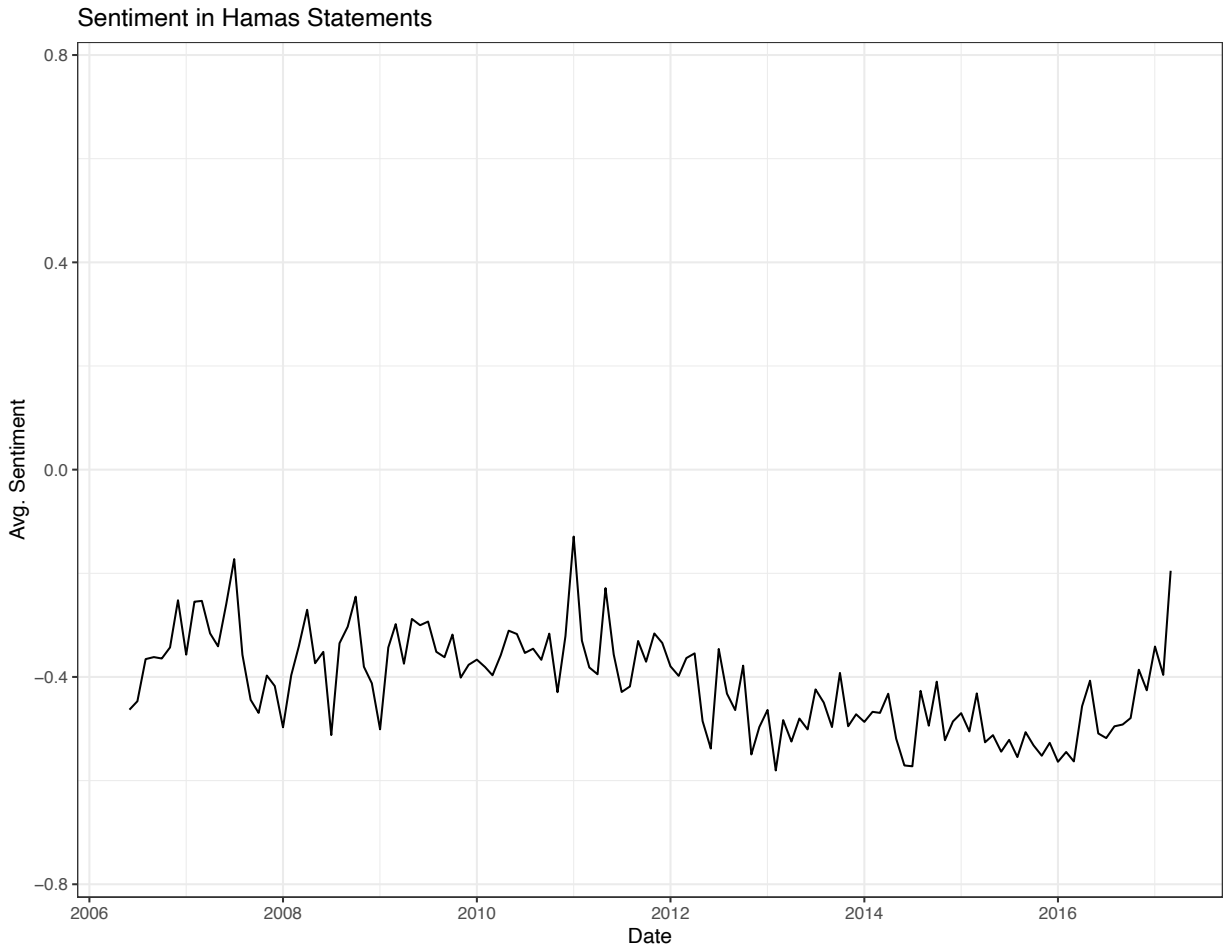


Figure 16: The average sentiment in Hamas statements coded a dictionary-based method. Lower values on the y-axis indicate greater negativity.

Next we turn to sentiment analysis, another approach widely deployed when dealing with textual data. The goal of the analysis is to measure the positivity or negativity in Hamas's statements. Figure 16 presents the results of the sentiment analysis across the sentences in Hamas's statements. Values at -1 mean that every sentence was negative in a given month, while values at 1 mean that every sentence was positive in a given month. It is clear that on average, Hamas statements are negative. In fact, there is no month were the average sentiment even reaches the 0 mark (indicating neutral). Missing however, is what Hamas is being negative about. Negativity could arise because they are engaging in violence against Israel, or because they are opposed to Fatah's political agenda. While these represent two distinct strategies and potentially two different types of groups, they are observably

equivalent in this implementation of sentiment analysis. This is not a criticism of sentiment analysis in general, we only point out that it is not the appropriate tools for our research question. One potential way of addressing this shortcoming is to investigate the sentiment of individual topics within the statements. This might provide insights into Hamas discourse on various concepts. A useful system might show us that the group is generally positive on topics that deal with their own supporters and actions, while being consistently negative about the actions of their competitors. However, the previously discussed shortcomings of bag-of-words based topic models persist. Figure 17 presents the average monthly sentiment on each of our twenty topics across time. We see that Topic 10 does focus largely on the group itself, yet is consistently negative. Overall, the sentiment on topic produces two general patterns, 1.) the sentiment within a topic is generally negative and stable, or 2.) the sentiment within a topic bounces wildly from positive to negative. These results are somewhat underwhelming. We see that Hamas's messages seem to contain a variety or aspects, violent and non-violent, as well as multiple actors, but their larger strategies remain opaque.

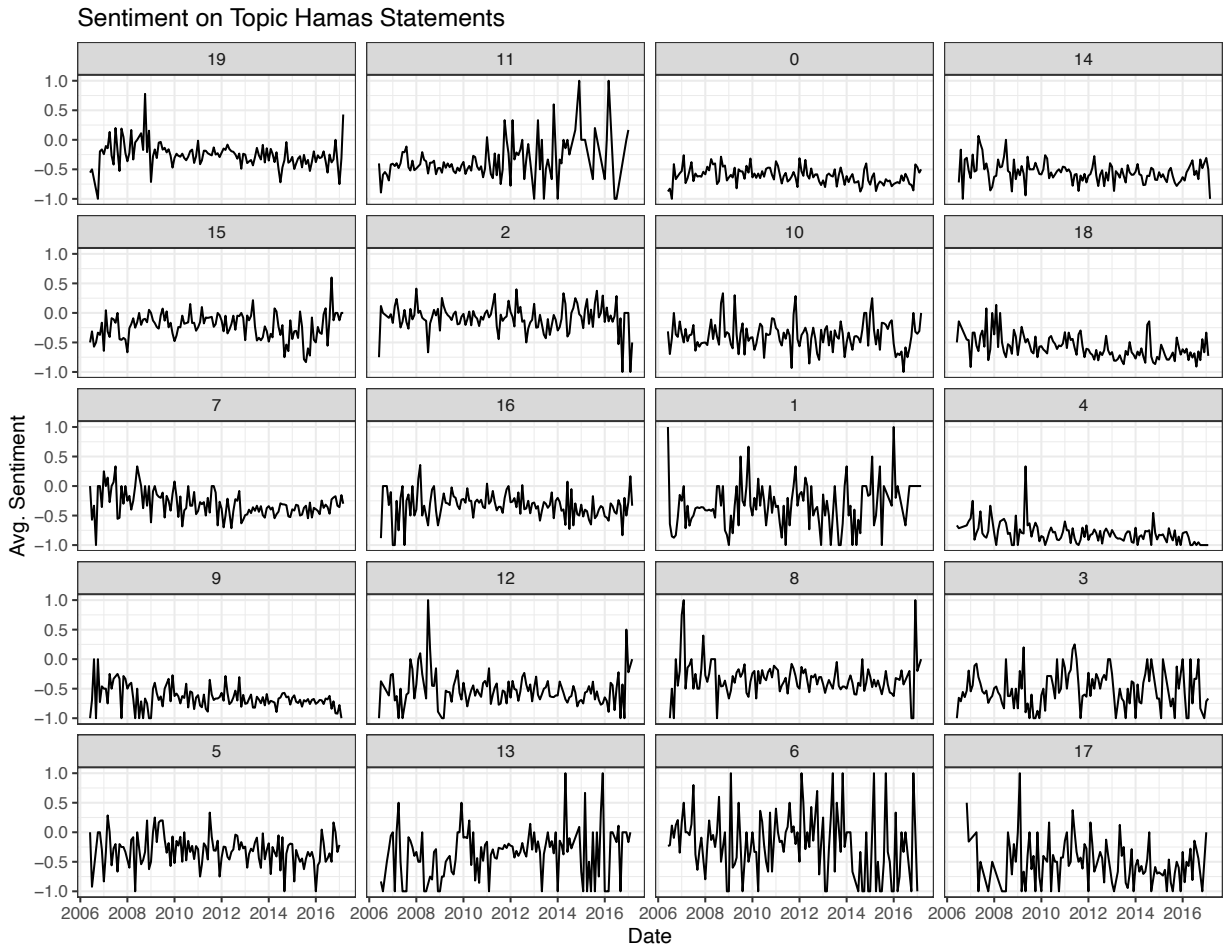


Figure 17: Average monthly sentiment across topic in Hamas's statements.

3.2 Measuring the Variety and Complexity of Messaging

To provide additional information on group messaging and appropriate tests for the presence of battles over perceptions, we now turn to our supervised learning and dependency parsing based approach, detailed in the previous chapter. In particular, we will lay out evidence that Hamas engages in a mix of strategies, discuses a variety of issues beyond extremist rhetoric, displays explicit position difference between themselves and competitors, while crafting arguments with many nested levels of complexity.

3.2.1 Average Depth of Sentence Dependency

While still at a relatively high level of aggregation it is worth providing some evidence about the overall complexity of the messages released by Hamas. The complexity of the messages is important because the components needed to build an effective narrative, such as referring to the actions of competitors as a justification for a group's own actions, require sentences that are themselves more complex. Figure 18 shows an example of the dependency graph of the sentence "Hamas fired two Qassam-rockets at Sederot." The simplicity of the sentence is reflected in the depth of the dependency parse, which has only three levels beyond the root. Importantly, adding additional actors does not increase the depth of this sentence so if the sentence were instead "Hamas launched rockets at the occupation army and settlers" it would still have a depth of 3. Thus long list of targets would not necessarily have a higher depth. Figure 19 shows a more complex sentence, "Qassam Brigades targeted the military vehicles and Zionist-soldiers who invade east of Rafah city with eight mortars." In this sentence we see that there are multiple actors (Qassam Brigades, military vehicles, Zionist-soldiers) each engaging in their own actions (OMEs) (targeted, invade). In turn this increased complexity leads to a sentence with more nested layers in the dependency graph. To assess the overall complexity of Hamas's messages, for each month we calculate the average maximum depth of the dependency parse across sentences. Observing that on average sentences are more deeply nested, suggests that the information being provided is more complex. Because our theory of battles over perceptions expects strategies to be used in conjunction and to be self reinforcing, this implies the need for more complex and thus more deeply nested sentences.

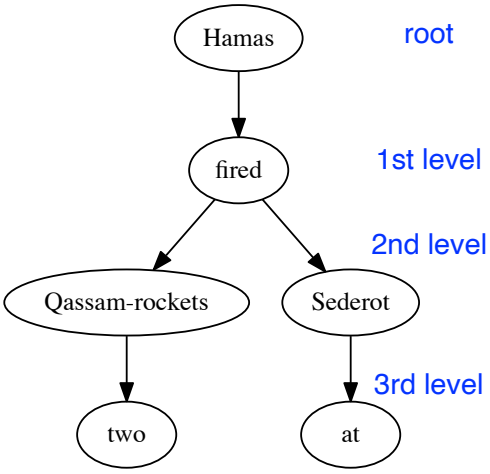


Figure 18: Graph of the dependency parse with the depth of each level in blue.

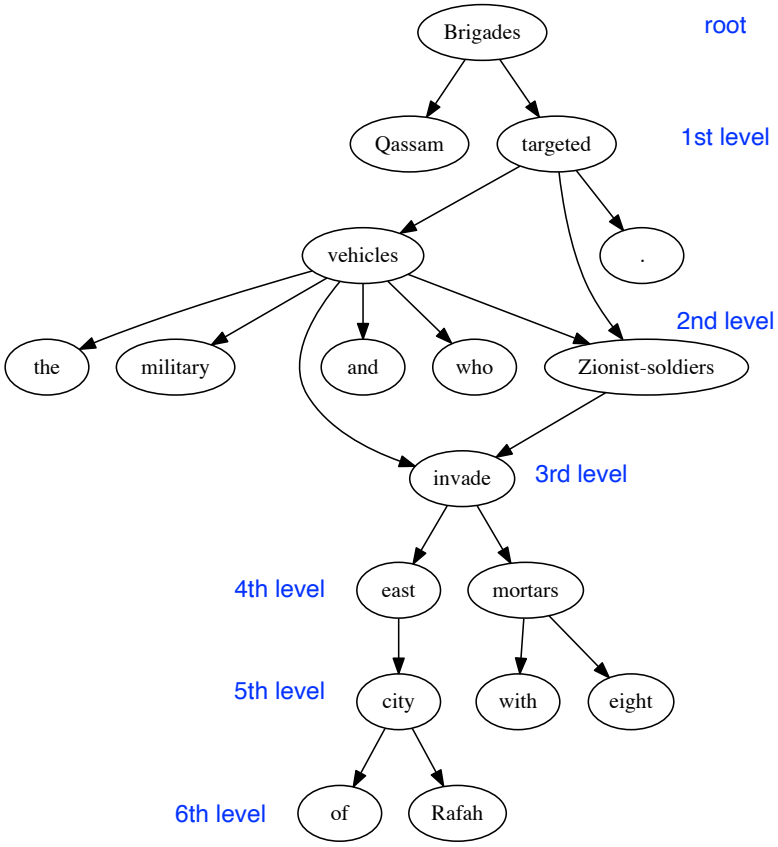


Figure 19: Graph of the dependency parse with the depth of each level in blue.

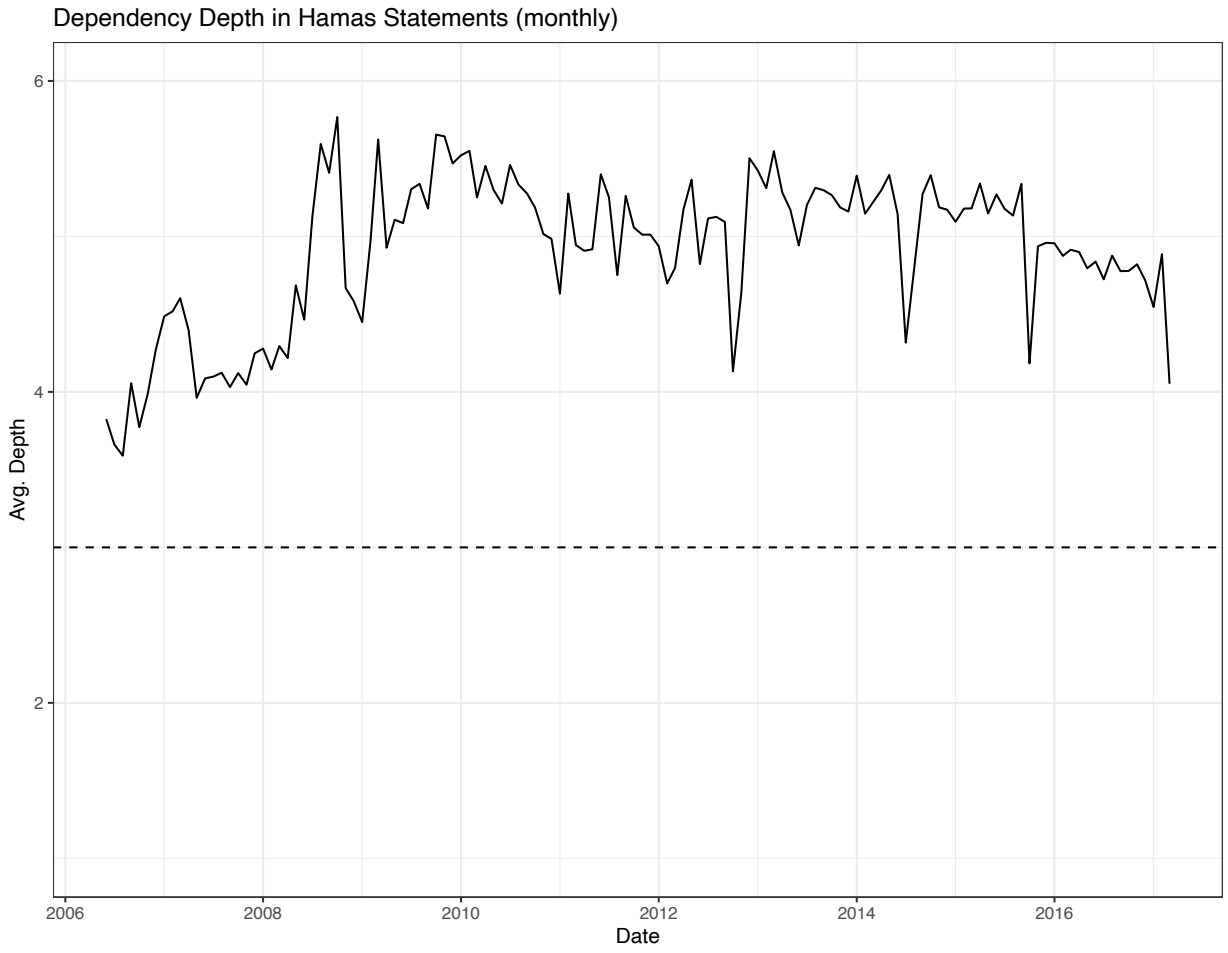


Figure 20: The average depth of nodes in a sentence's dependency parse, aggregated monthly. The dashed line represents the depth of a a simple sentence, such as the one featured in Figure 18.

Table 20 plots the average depth of the sentences in Hamas messages aggregated monthly. The dashed line represents a baseline level of complexity that is the same depth as Figure 18. As we see in most months there are between one and two additional nested levels. Interestingly, the complexity of the sentences increases fairly considerably from 2006 to 2008, increasing by almost an entire level. We also see that the decline of the complexity of Hamas's statements occurs alongside the overall decrease in the volume of their messaging in 2016 and 2017. Overall, we see that on average a sentence is more likely to be near the complexity level of Figure 19, rather than Figure 18.

3.2.2 Aggregate Evidence of Strategies

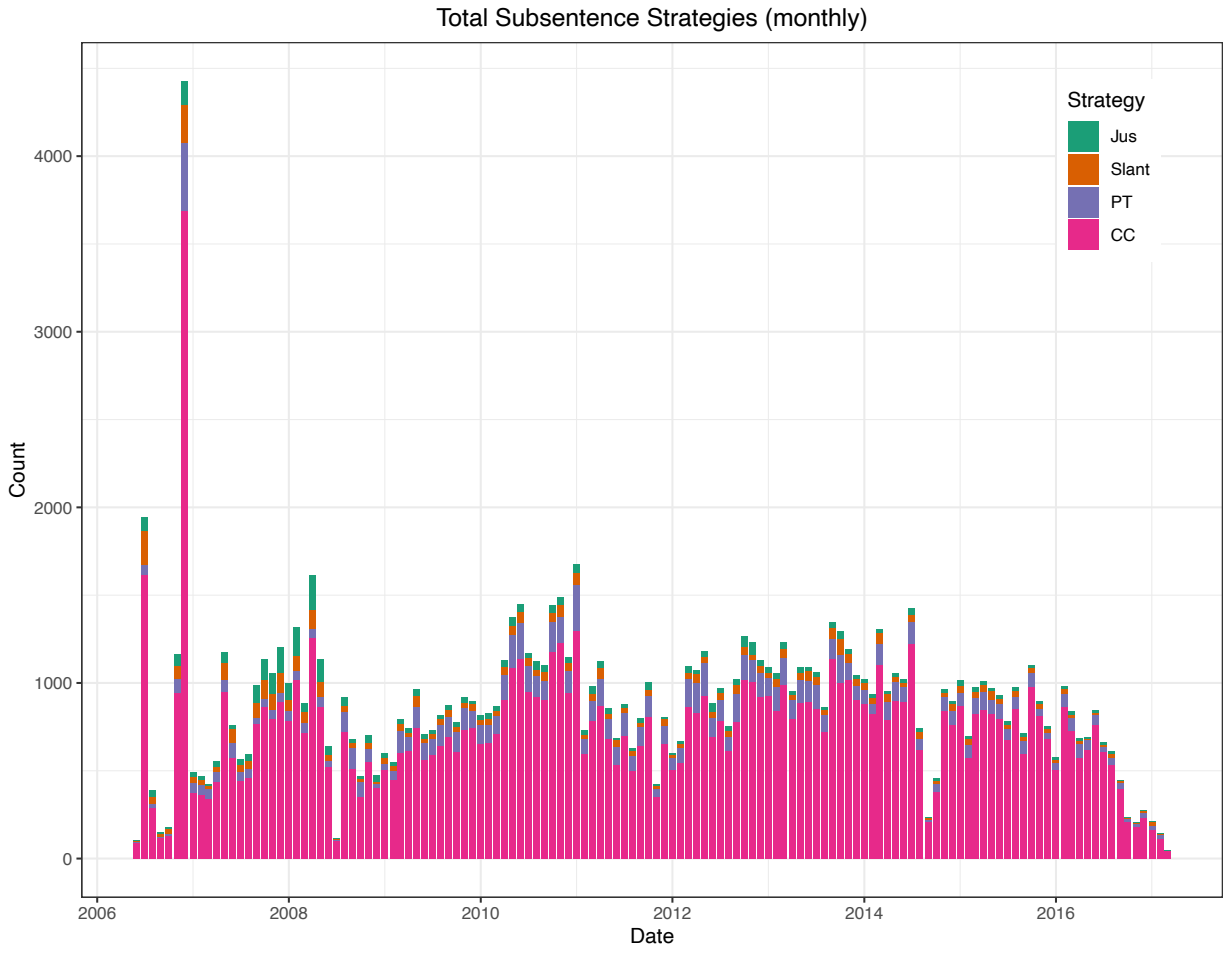


Figure 21: Total number of subsentence strategies within Hamas statements per month.

To begin the presentation of the results from our research design we plot the number of total occurrences of any strategy in the Hamas corpus within a given month in Figure 21. In total we see an ebb and flow of the number of observations over time. The two largest spikes both occur near the start of the data in 2006. This appears to coincide with increased conflict between Fatah and Hamas. On the other had, by mid-2016 the number of observations is consistently low, and almost non-existent for the three months of 2017 included in the sample.[2] The bars of the plot are sorted by the total use of a strategy across the documents.

[2]Interestingly soon after collecting this data the site stopped being updated and now links to a page asking individuals to donate to the group using Bitcoin

We see that Credit Claiming is the most used strategy in each month of the data, with Position Taking a distant second. Table 11 aggregates the data in Figure 21 by strategy. Again we see a majority of the observation are Credit Claiming, yet there are still a large number of instances of Position Taking.

Table 11: Counts of observations of each general strategy in Hamas statements.

Strategy	Count
Credit Claim	94956
Position Taking	11577
Slant	5262
Justification	4285

3.2.3 Connecting Strategies and Perpetrators

While Figure 21 shows evidence of strategies being deployed, a more precise evaluation of battles of perceptions would focus on instances where there is an explicit perpetrator carrying out the strategy. Credit claiming can not really take place without someone that is making the claim, the same is true for position taking.[3] If we restrict the data to include only observations with a perpetrator the total number of observations drops to 26,529. There are three primary reasons for this dropoff, 1.) the passive voice, sentences such as "Rockets were fired at the settlement", do not contain an explicit perpetrator and thus would not be included. 2.) The model does not identify the perpetrator in the sentence. While the trained model is able to accurately classify perpetrators in our corpus, it is not perfect (the recall of the model is .85). 3.) The sentence is formatted in a way that the dependency parser does not connect a node which is tagged as a perpetrator.[4] The remainder of the chapter will focus on observations where either Hamas or Israel, Hamas's primary adversary, are the perpetrator. Hamas observations are obtained by selecting all observations where

[3]While we might assume that since these are Hamas's documents that they are the perpetrator, we will show that in fact they discuss a variety of other actors, and that naively assigning Hamas as the perpetrator muddles the things Hamas is saying about themselves and their competitors.

[4]Because a given node can be both a perpetrator and a victim I only allows in-edges to be perpetrators. This means that a sentence where the perpetrator is an out-edge to an OME would be missed, for instance "Israeli attacks on Gaza." Future work will aim to improve the connecting of aspects and perpetrators.

Hamas, their military wing, or the word "our" is the perpetrator. Israel observations are obtained by selecting all observations in which Israel, the word "Zionist", or the names of Israeli Prime Ministers are the perpetrator. The number of observations where Hamas is the perpetrator is 4,869, for Israel it is 11,184. The fact that Israel has more mentions than Hamas is interesting, and calls for further research. Some of this difference, but not all, is due to Hamas sometimes referencing the actions carried out by individual members of their group, or using the pronoun "he." These observation could be incorporated, by assuming Arabic names, or the word "he" refer to Hamas, but we opt for a more conservative approach.

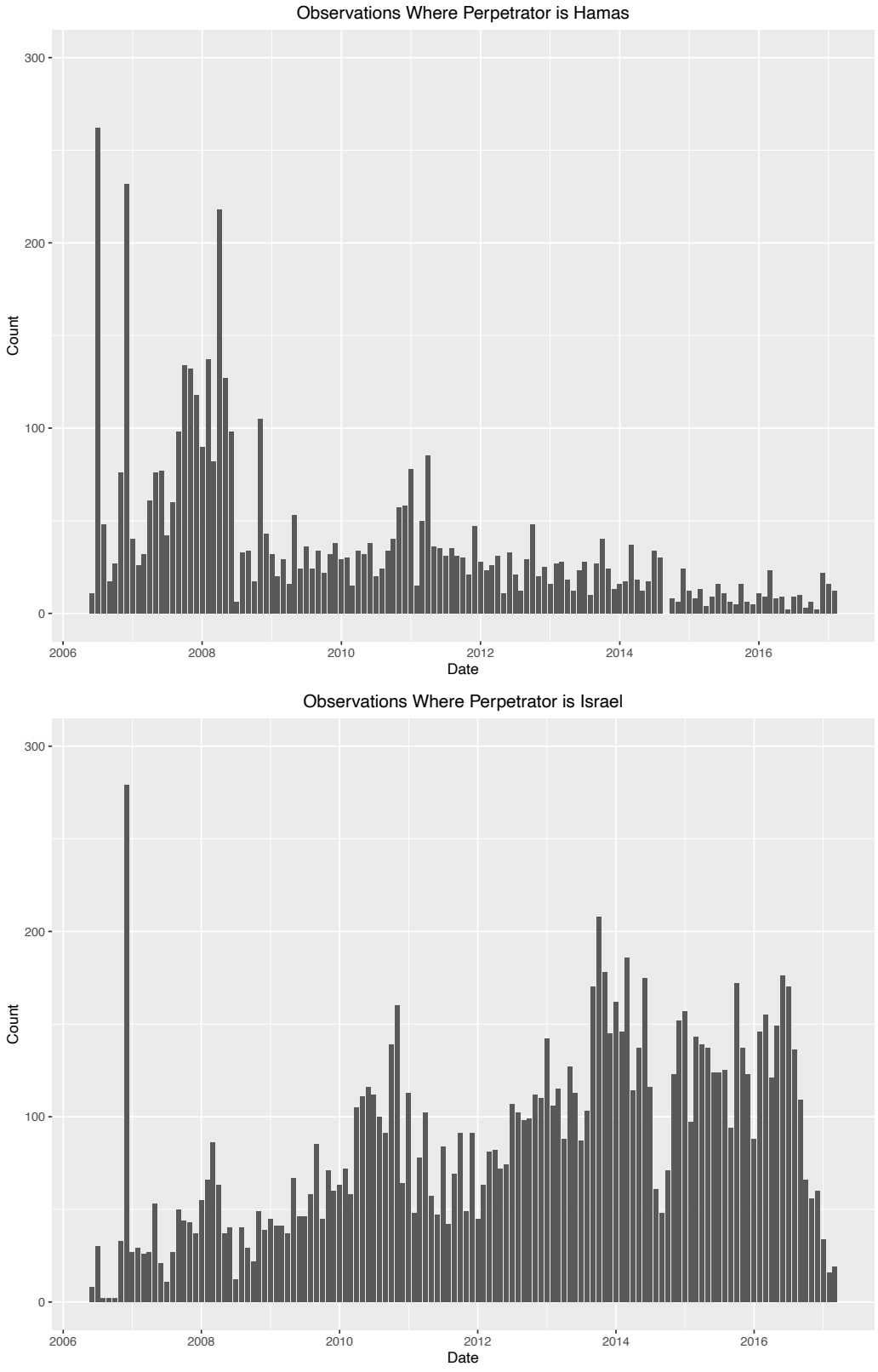


Figure 22: Observations where Hamas or Israel is the perpetrator.

Figure 22 displays the count of observations for each perpetrator over time. The first, somewhat striking observation, is that Hamas not only refers to Israel but appears to refer to them more than their own group. The is promising evidence in support of the broadest conceptualization of battles over perceptions, that groups aim to both mobilize support for their group and demobilize support for their opposition. We also see some interesting trends over time which suggest avenues for future, more in depth, quantitative case studies. First, many of the observation where Hamas is the perpetrator occur between 2006 and 2008. This represents the time period were Hamas wins their first parliamentary election, and has multiple conflicts with Fatah and Israel. Second, while by 2009 most of the observation focused on Israel, the largest number of observations actually occurs at the end of 2006. The occurs during the same month that then Israeli Prime Minister Ehud Olmert and Palestinian President Mahmoud Abbas held surprise talks where Israel agreed to release 100 million in humanitarian aid to Abbas.[5] Further probing this time frame may provide new details on Hamas's attempts to derail reconciliation between Fatah and Israel.

3.2.4 Use of Strategies by Perpetrators

Taking the observation where Hamas or Israel is the perpetrator, we can now investigate the use of various strategies. Theoretically, the battle over perceptions requires groups to both claim credit for their violence, while also taking positions on various issues. Similarly, groups are also expected to address the actions and positions of their competitors. To evaluate the evidence for this conjecture we count the number of observations which are credit claiming or position taking in a given month for both Hamas and Israel observations. To normalize these values we then divided by the total number of observations in that month. Figure 23 displays these results for observations where Hamas is the perpetrator.[6] While in earlier years we see more examples of credit claiming, there is relative balance between credit claiming and position taking overall. The provides some evidence that Hamas is engaging in more than just claiming credit for their violence. In fact, in some months they seem more

[5]https://www.npr.org/transcripts/6668521?storyId=6668521?storyId=6668521

[6]Because credit claims and position taking make up the bulk of the observations the plots appear to simply be reflections of one another, however, because observation can also be slants or justifications, this is not the case.

focused on position taking, than credit claiming.

Figure 24 displays a similar plot expect that they include observations were Israel is the perpetrator. Here the trend is very different from what we observe in Figure 23. In the earliest periods there is relative balance between blame[7] and position taking, but from 2007 on the proportion of blame never drops below .80. This suggests that Hamas is more focused on pointing out actions carried out by Israel, than on their their positions. The relative stability of casting blame across time is interesting given that there are periods of escalation and deescalation in the conflict between Hamas and Israel. A deeper exploration of Hamas's seeming engagement in a "blame Israel no matter what" communication policy is needed.

[7]When the actor is not the author of the document credit claiming is called blame. The authors is pointing out the actions carried out by someone else.

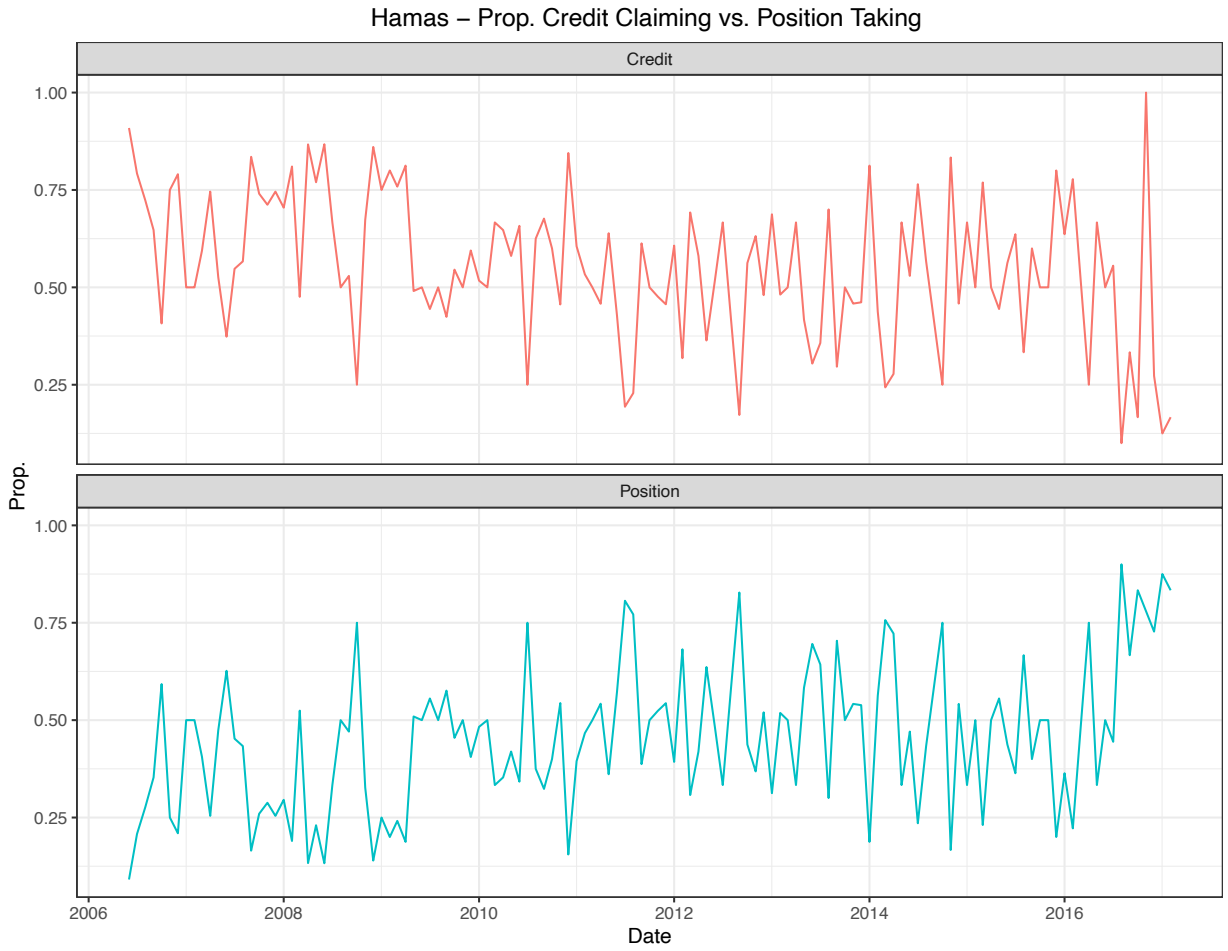


Figure 23: Credit claiming and position taking as a proportion of the total observations where Hamas is the perpetrator.

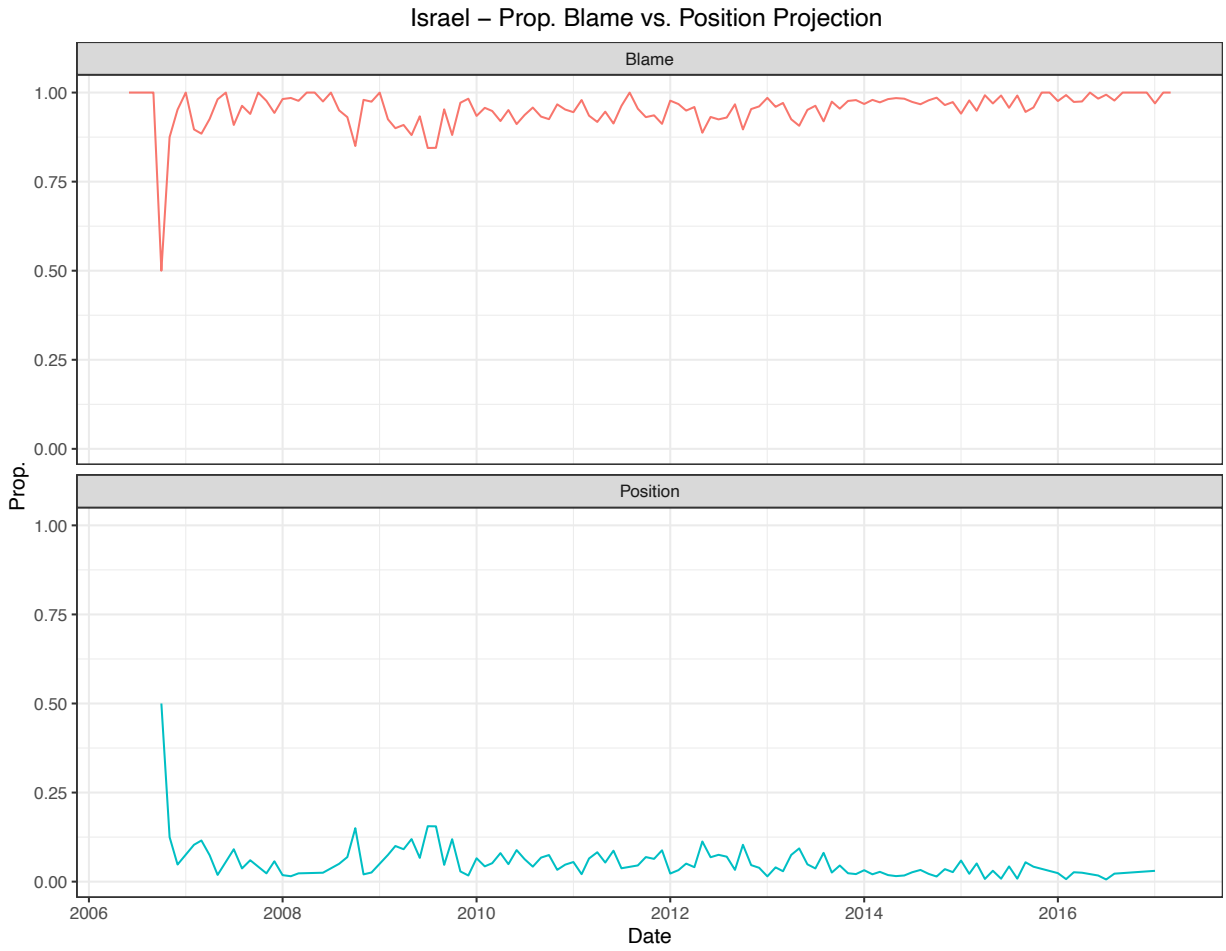


Figure 24: Blame and position projection as a proportion of the total observations where Israel is the perpetrator.

3.2.5 Issues by Perpetrator

However, the battle over perceptions is not only about the general strategies groups engage in. We expect groups to also messaging on a variety of aspect in order to recruit from diverse pools of potential supporters. Further our research design allows us to explore the variety of the messages, and compare how the emphasis of issues changes by perpetrator. Because our underlying data is textual, there is rich information not just on how groups message, but what they message about. Recall that for each of the observations in our data there is a general strategy, a perpetrator, but also an aspect that is being refereed to, which we call OMEs (objectives/means/events). Because these OMEs are words which our model

has classified as being relevant aspects of conflicts, we can investigate the usage of OMEs across perpetrators and messaging strategies. One challenge to effectively summarizing the content of the observations is that text data is both sparse and high dimensional. To begin to address both of these challenges we stem each of the observed OMEs. Stemming involves removing the endings of words such that the terms "launched" and "launches" would both resolve to "launch." This helps collapse concepts, which while having slightly different forms, mean the same thing.[8] Table 12 displays the counts of the top five most used OMEs in observations where Hamas or Israel is the perpetrator. Interestingly we see that for both perpetrators the most used terms focus on acts of violence or contention. For Hamas the terms center on the group's launching of various projectiles into Israel, while the Israel terms focus on their their tactics and violence.

Table 12: Total counts of each OME stem in observations where Hamas (left) or Israel (right) is the perpetrator.

Hamas

OME	Count
fire	714
mortar	390
rocket	218
oper	177
shell	129

Israel

OME	Count
kidnap	1024
fire	864
invad	728
attack	630
arrest	426

While we see that Table 12 features a number of words which deal with violence, up to this point we still do not know if these are examples of a perpetrator carrying out these actions or taking a position on them. This distinction is important, because we may be lumping together very different types of groups. Imagine there were two groups, one who exclusively claimed credit for their rocket attacks, and another that exclusively stated their opposition to

[8] A downside of stemming is that it can produce stems that are not actual words. An alternative is to lemmatize. While lemmatization still removes word endings, the process is carried out based on a word's linguistic features and the resulting stem is drawn from a dictionary of root terms, making them more interpretable. Future work will explore the use of lemmatization, as well as more in-depth approaches to linking semantically similar concepts.

rocket attacks. These two groups, despite being very different would be observably equivalent in Table 12, both would have high counts for the term "rocket" or "attack." However, this issue can be corrected by investigating how word usage differs between perpetrators within specific strategies.

Figure 25 plots the count of each OME used in credit claiming observations. Red bars represent usage when Hamas is the perpetrator while blue bars represent usage when Israel is the perpetrator. The words on the x-axis are ordered by the log-likelihood of that word being used by one perpetrator relative to the other. Words to the left of the plot are more likely to be used when Israel is the perpetrator and words to the right are more likely to be used when Hamas is the perpetrator. The counts for both perpetrators are plotted together so that the distributions can be visually compared. Overall, we see that there are considerably more observations of credit claiming when Israel is the perpetrator, consistent with previous results. Looking at the left portion of the plot, those most likely to be used when Israel is the perpetrator, we see words that focus on police actions and invasion. Comparing the height of the red bars in this area we see that these words are rarely used when Hamas is the perpetrator. Turning to Hamas, we see that three of the five words most likely to appear when Hamas is the perpetrator revolve around projectiles. Given Hamas's focus on launching rockets and mortars into Israel, this is unsurprising. However, within the top five words we also see "elect[ion]", suggesting that Hamas is claiming credit not only for their violent actions, but also their political success. Further we also see words such as "agreement" and "right." This suggests that even credit claiming, is more complex and varied than has been previously discussed in the literature. In sum we see two patterns in this plot, Hamas focuses heavily on Israeli violence and interventions, and Hamas claims credit for their own acts of violence, but also points to electoral victories and other political agreements.

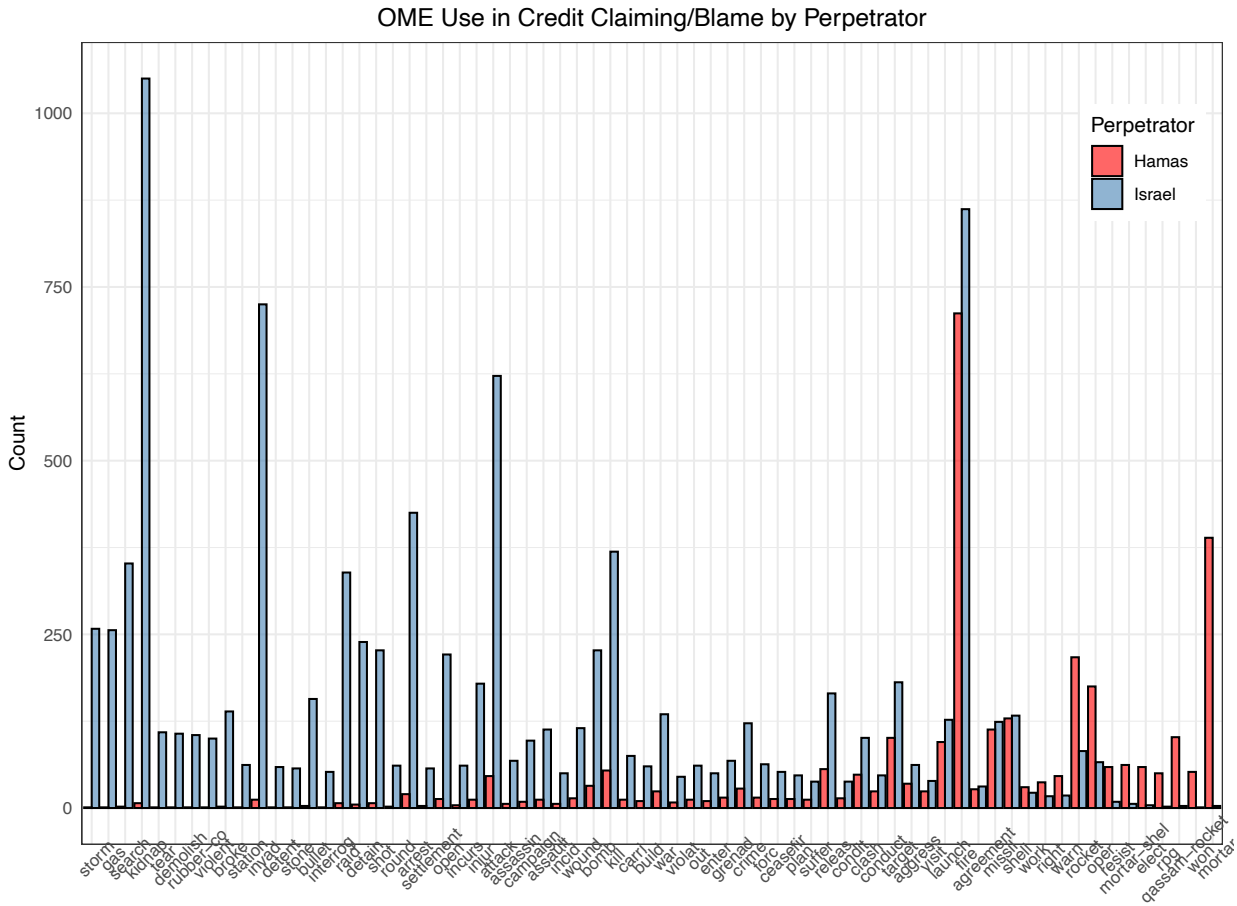


Figure 25: Counts of a OMEs (objectives/means/events) by perpetrator in sentences labeled Credit Claim/Blame. Values are sorted by their log-likelihood of being used by one perpetrator relative to the other. OMEs that are used at least five time across actors are shown.

Figure 26 plots the count of each OME used in position taking observations when either Hamas or Israel is the perpetrator. In contract to Figure 23 here we see considerably more position taking when Hamas is the perpetrator. Interestingly, Hamas takes positions on a variety of issues. This includes a variety of non-violent political issues, such as "aid", "right", "reconciliation", and "talk." One specific example of position taking on non-violent issues occurs in 2014 when Hamas issued the following statement, "The Hamas official underlined that his Movement wants stable reconciliation..." While we do see the group often takes positions on violent activities, the presence of non-violent actions further demonstrates the

breath of messaging that violent organizations engage in. This level of detail would be missed without a system that can extract the actors, issues, and positions taken within the statements of violent political actors. Importantly, however we have not yet addressed if these given aspect are being supported or opposed. The next section will outline a model that will allow to extract the positions of various aspects, and track actors positions over time.

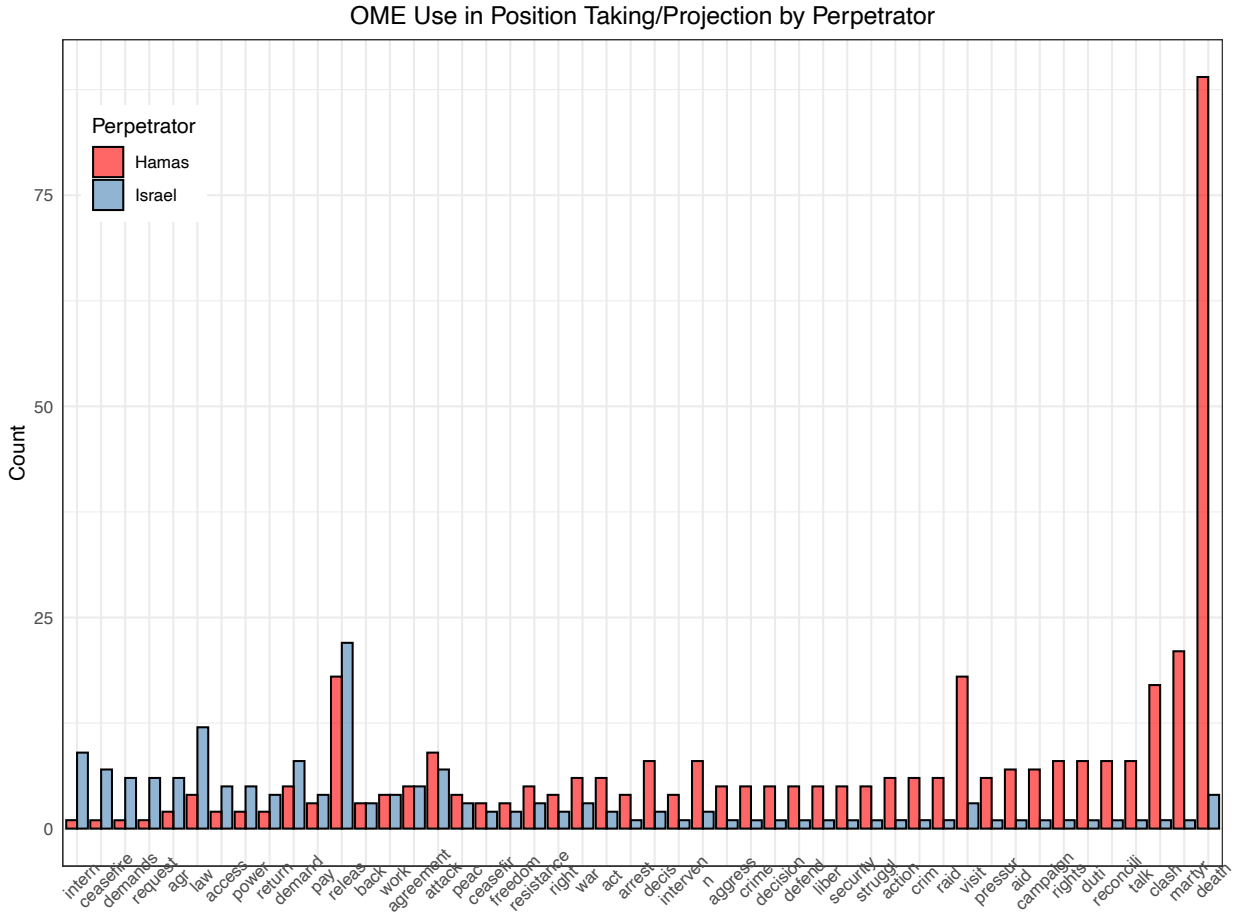


Figure 26: Counts of OMEs (objectives/means/events) by perpetrator in sentences labeled Position Taking/Projection. Values are sorted by their log-likelihood of being used by one perpetrator relative to the other. OMEs that are used at least five time across actors are shown.

3.2.6 Extracting Group Positions and Distinctions from Messages

Unlike existing approaches, such as topic modeling and sentiment analysis, my approach identifies if Hamas is communicating about themselves or another actor, if that actor supports or opposes some aspect, and the words that represent that aspect. From this information we can systemically extract the contrasts Hamas draws between themselves and Israel. This information is retrieved by fitting an ideal points model on our textual data. Before detailing the model it is worth briefly describing the standard ideal point model, and how our model differs from existing approaches which aim to estimate ideal points using textual data. The equation below represents the ideal point model introduced by [68].

$$Pr(y_{ij} = 1) = F(\beta_{j1} x_i - \beta_{j2})$$

Because in political science the ideal points model is most associated with measuring the positions of legislators [69, 23], based on their votes on various bills, I will adopt similar language to explain the various parameters. i indexes individual legislators, while j indexes bills. F is the standard normal CDF for the probit. y_{ij} represents the vote of legislator i on bill j, either yea or nay. A given legislator's latent position or ideal point is measured by x_i, while the latent position of a given bill, or the difficulty parameter is estimated by β_{j2}. β_{j1}, the discrimination parameter, measures how well a given bill discriminates between left leaning and right leaning legislators. Thus the goal of the approach is to extract legislator positions (often on a single dimension left-right continuum) based on how they vote on various bills. Legislators should be more likely to vote in favor legislation which is positionally closer to them. Having these positional measures allows researchers to both make comparisons between actors, and use the estimated ideal points to address additional substantive questions [96, 37].

This scaling approach has also been applied to text data [13, 101, 132]. A widely used model, Wordfish, [132] is shown below. A key difference between this model and the ideal points model detailed earlier is that instead of votes on bills, the model is fit using the counts of words issued by a given party. Similar to the ideal points model we also aim to estimate β_j, the discrimination of a given word and ω_i a party's ideal point.

$$y_{ij} \sim Poisson(\lambda_{ij})$$
$$\lambda_{ij} = \exp(\alpha_i + \psi_j + \beta_j * \omega_i)$$

However, if all we have are counts of words, measuring actor ideal points is more difficult than when analyzing the votes of legislators [101]. In a standard ideal point model, the bills provide context for a given vote. However, in text scaling models the word cannot serve as both the context and the vote. This implies that either every word is it's own "bill", and by using that word you are "voting in favor of it" and by not using the word you are "voting against it" or that there is one "bill" and and words are different positions on that bill. This estimation challenge has often led researchers to either select into the topic begin discussed or to compare the model to a reference text.

3.2.6.1 Model Estimation and Identification

$$\begin{aligned} y^*_{ijt} \sim & \text{logit}^{-1}(\eta_{ijt}) \\ \eta_{ijt} = & -\gamma_i(\alpha_{jt} - \beta_i)^2 \\ & \gamma \sim ln(N(0,1)) \\ & \beta \sim N(0,1) \\ & \alpha_{2:T} \sim N(\alpha_{t-1}, .05) \end{aligned} \tag{3.1}$$

The model here builds on existing work measuring human rights reporting in the texts complied by various NGOs [112, 114, 113] and ongoing work using this text to scale state's human rights practices [26]. The model is most similar in form to the one presented in [11], which aims to scale individuals based on their twitter followers. Equation 3.1 is our text based ideal point model.[9] A key difference from the previously described ideal point model is there is not a discrete status quo position. Thus we model the process as one of relative expressions. Hamas will support word/policies that are closer to how it wants to be seen, and oppose words it does not want to be associated with. Similarly, Hamas will express that Israel supports words/policies that it wants to project Israel as being close to, while saying that Israel opposes words/policies they do not want Israel being perceived as representing.

[9]The model is fit using the Stan programming language [43]

Thus support for a word/policy should be a function of the distance between the word's position and how Hamas wants themselves or Israel to be perceived.

Unlike other text based scaling methods we are not using the counts of words within a text to estimate actor or document positions. Rather our research design provides us with the perpetrator, the aspect under discussion, and the judgement being cast on that aspect. This set of information is analogous to what is used to fit traditional ideal points models. In our case perpetrators fill the role of legislators, aspects (OMEs) fill the role of bills, and positions taken by a given perpetrator fill the role of votes. Thus similar to the previous ideal point model α_{jt} represents a given perpetrator's ideal point at time t, β_i represents the latent position of a given word, and γ_j represents the discrimination of a given word. To define our Bayesian model we must also set priors for the three parameters being estimated. γ and β are given regularizing priors while α values in times after t_1 are given a prior with the mean set to the value of the parameter in $t-1$. The has the effect of making the ideal point estimates vary smoothly over time. This choice, along with the prior specifications, will be further interrogated as more groups are added and the classifier and dependency parse research design are improved.

As laid out by [9], the ideal point model is not identified without additional constrains, which often involves fixing the position of some actor or bill parameters. To identify the model we place tight priors, that are opposite in sign, around the first observation for both Hamas and Israel. Similarly, we fix the position of four words.[10] Words which are used with sufficient frequency and that are generally supported by the perpetrator with the same sign as them, and opposed by the actor with the opposite sign as them, have been selected. These

[10] An additional constraint is that γ is set to be positive.

constraints appear in Equation 3.2.

$$
\begin{aligned}
\alpha_{1,1} &\sim N(2, .01) \\
\alpha_{1,2} &\sim N(-2, .01) \\
\beta_{180} &\sim N(-2, .01) \\
\beta_{83} &\sim N(-2, .01) \\
\beta_{87} &\sim N(2, .01) \\
\beta_{248} &\sim N(2, .01)
\end{aligned}
\tag{3.2}
$$

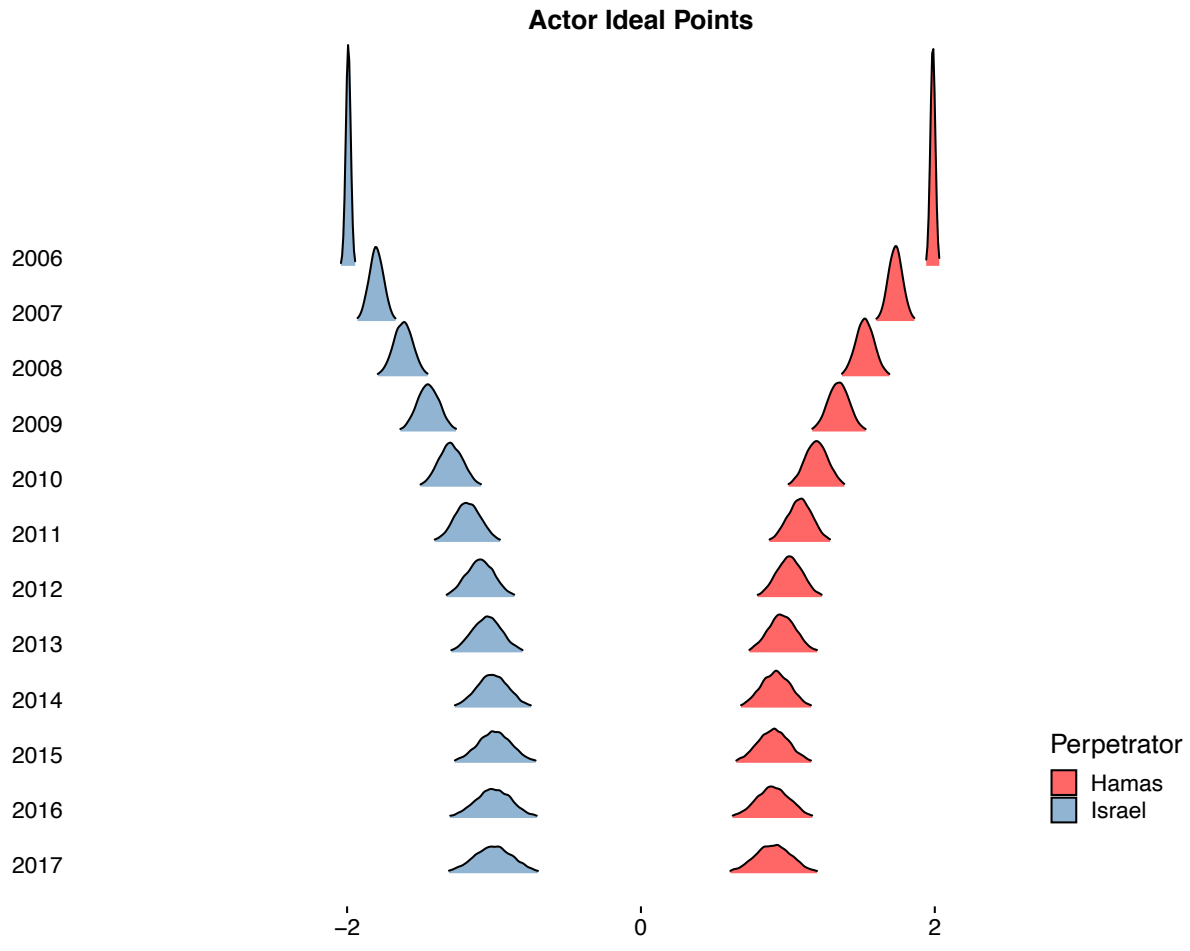


Figure 27: Ideals points of perpetrators Hamas (red) and Israel (blue).

Before proceeding it is worth clarifying that because there are only messages from a single actor, Hamas, the results below are how Hamas aims to define their own positions and those of Israel. While this does not allow us to measure Israel's actual latent positions, it does allows us to evaluate a key component of battles over perceptions, how groups aim to define the goals and positions of their competitors. Figure 27 displays the ideals points (α_{jt}) for the perpetrators Hamas and Israel. At each time period we plot the full posterior distribution for each of the actors. To identify the model we need to set priors on a mix of ideal points and stance parameters. We begin with Hamas and Israel on oppose sides of a continuum but allow them to move over time.

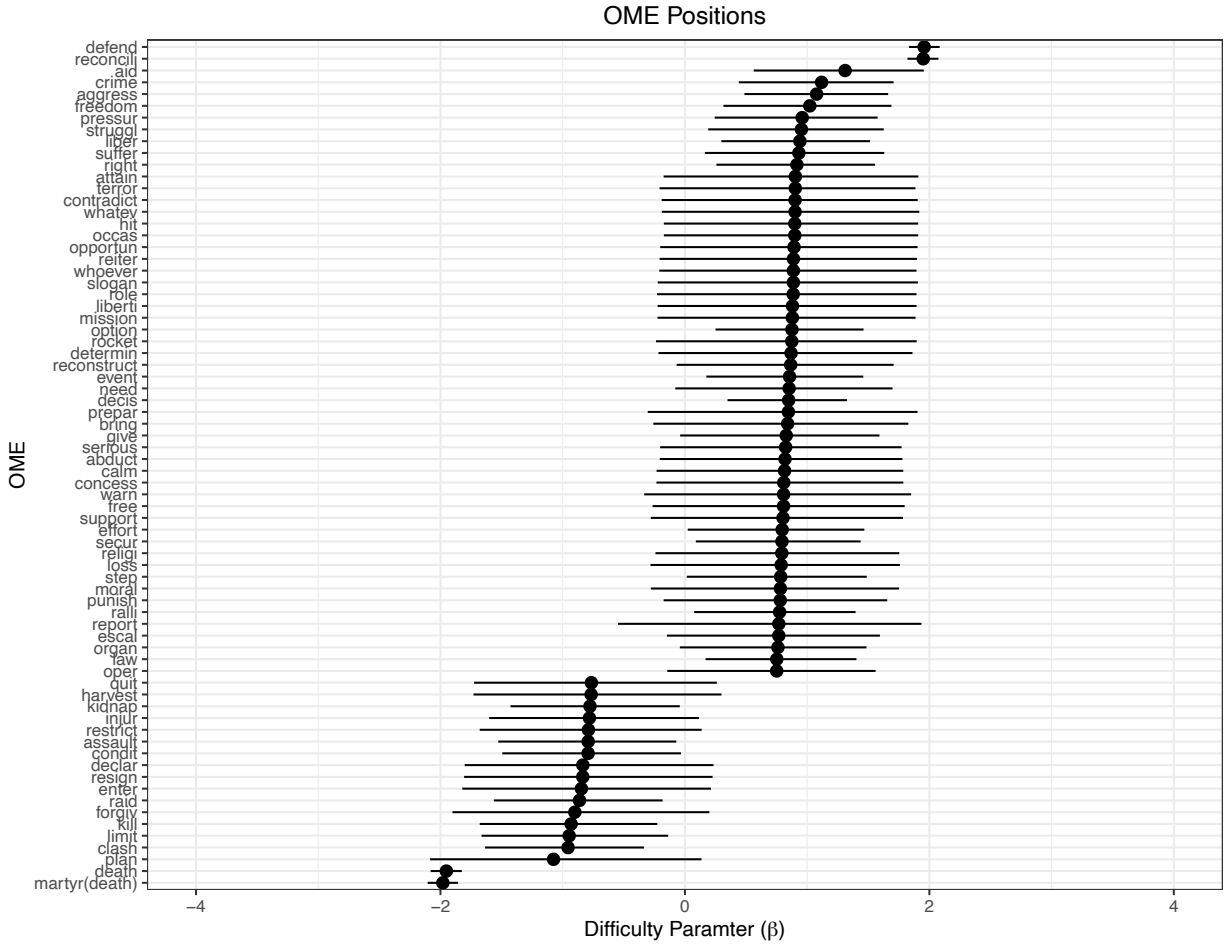


Figure 28: Difficulty parameters and 95% credible interval for each OME with an absolute value of .75 or greater.

Figure 27 displays the latent positions of the words/stances (β_i) in Position Taking

observations. Words to the left of zero are those that Hamas is more likely to oppose and more likely to say Israel supports, while words to the right of zero are those that Hamas is more likely to support and more likely to say Israel opposes. We observe that the words Hamas is more likely to support again include a variety of non-violent actions such as "aid", "reconclie", "liberaton", and "freedom." Consistent with the results of the credit claiming observations, Hamas is likely to talk about both their violence, such as launching rockets, but also their engagement in cooperative endeavors. Looking at the left side of the plot tells a different story. Here Hamas is more likely to say that Israel supports a variety of violent actions such as "kipnap", "assault", and "kill." Overall, Hamas seems to point out that Israel is in favor of acts of violence, while they point out that their group supports the political process and acts in support of broader liberation of Palestinians. This observation is not what we would necessarily expect to find in the statements of a group which regularly engages in attacks against civilians, and has derailed peace processes in the past. The focus on not just violence, but traditional politics suggests there may be more complexity in the messages of violent groups than is often assumed. Similarly, the fact that we observe Hamas making the claim that Israel supports various forms of violence, further suggests that groups not only escalate their violence to compete, but may also point to the violence of others as a means of delegitimizing them.

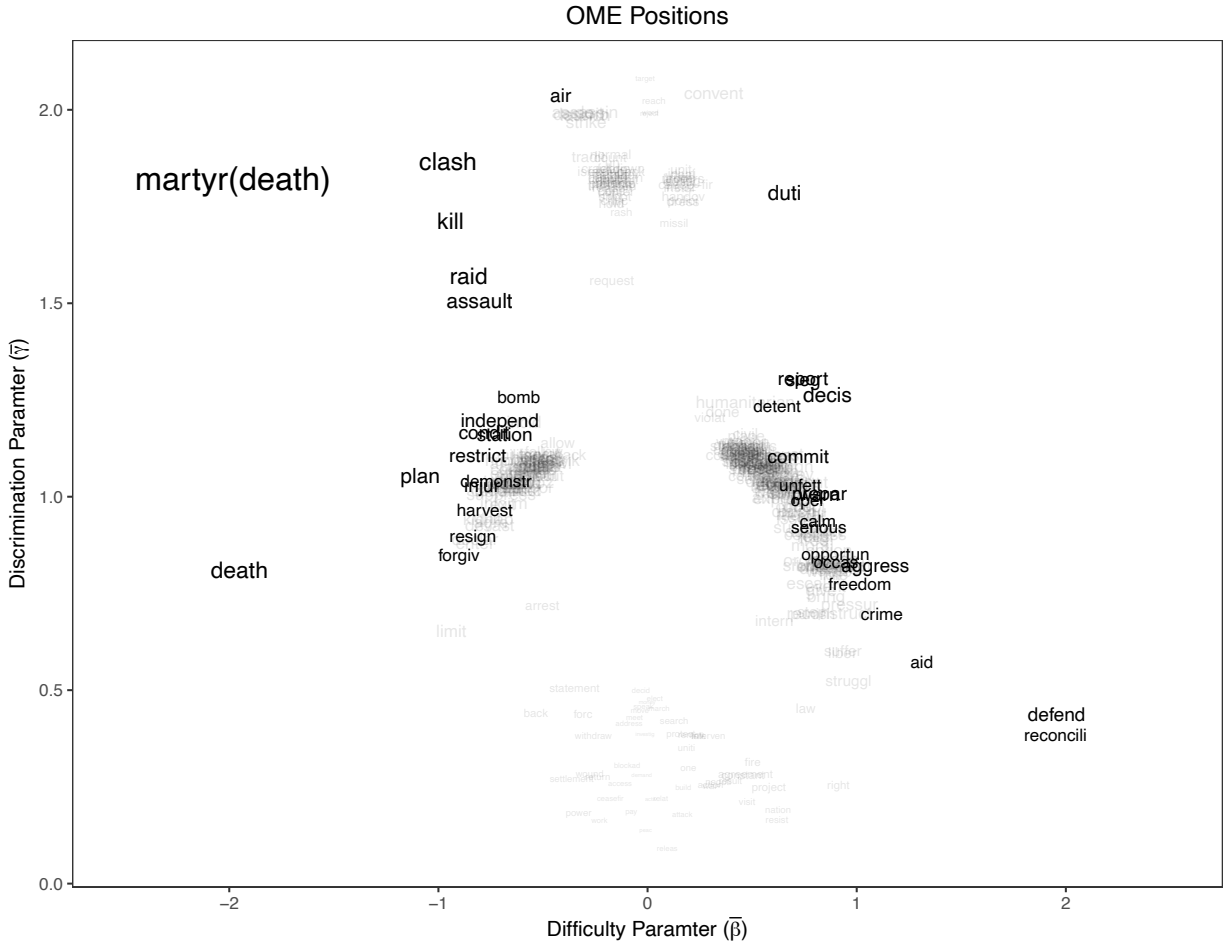


Figure 29: The difficulty and discrimination parameters for all OMEs in Position Taking observations. The size and opacity of the OMEs are keyed to the absolute values of the product of the mean of each OME's difficulty and discrimination parameters.

To get a more complete picture of the difference in words usage associated with each actor, we plot the mean of each OME's difficulty and discrimination parameters. For the difficulty parameter values to the left of 0 are those that Hamas is more likely to oppose and more likely to say Israel supports. The words to the right of 0 are those that Hamas is more likely to support and more likely to say Israel opposes. For discrimination, values further from 0 have a larger discrimination, meaning these word draw a clear contrast between Hamas from Israel. Words with larger labels and darker text represent observations with higher combined values of γ and β. Looking at the space in the top left of the plot we see words which provide clear contrast between the two actors and that Hamas is more likely

to say Israel supports. Each of the words deals with an act of violence, consistent with our previous results. Turning to the right side of the plot we see more focus on non-violent actions. Words such as "freedom", "aid", and "calm" do not reflect the extremism that one might expect from a violent non-state group. Further, words such as "duti[es]" and "commit[ment]" may be attempts to portray the group as engaging in various activities to aid others, rather being senseless violence. A key takeaway point is that if we were to simply look at the text of Hamas at a highly aggregated level, we would see lots of evidence of violent actions. However, we would seemingly be wrong to assume that Hamas is simply projecting an extremist image. Because our research design allows us to associate the perpetrator of an action and the strategy being deployed we see they are often associating these acts of violence with Israel. While this information can be captured by the close reading of the text, previous automated text approaches have struggled to extract this level of nuance and detail.

While the example presented above is relatively simple, it can be easily extended to include additional groups. Further, the implementation of hierarchical priors would allow us to effectively estimate group's latent positions, even when they do not produce a large volume of text. This potentially allows for large-N analyses of group positions. These estimated positions can in turn be used as features for predictive models, or independent variables in regression analyses to further explore theoretical questions.

3.3 Violence Alongside Messaging

While our theory proposes that messaging is used as a compliment to violence, rather than a substitute, the previous analyses have not directly tested this conjecture. To investigate the relationship between violence and messaging, we first collect all of Hamas's violent events, drawn from the ICEWS data set and our observations where Hamas is the perpetrator. The data covers the years 2006 to 2017 and is aggregated monthly. Figure 30 plots the number of observation in each of these data sources over time. Overall the trends seem somewhat correlated, with the exception of two large upticks in 2012 and 2014 which are not mirrored in our textual data.

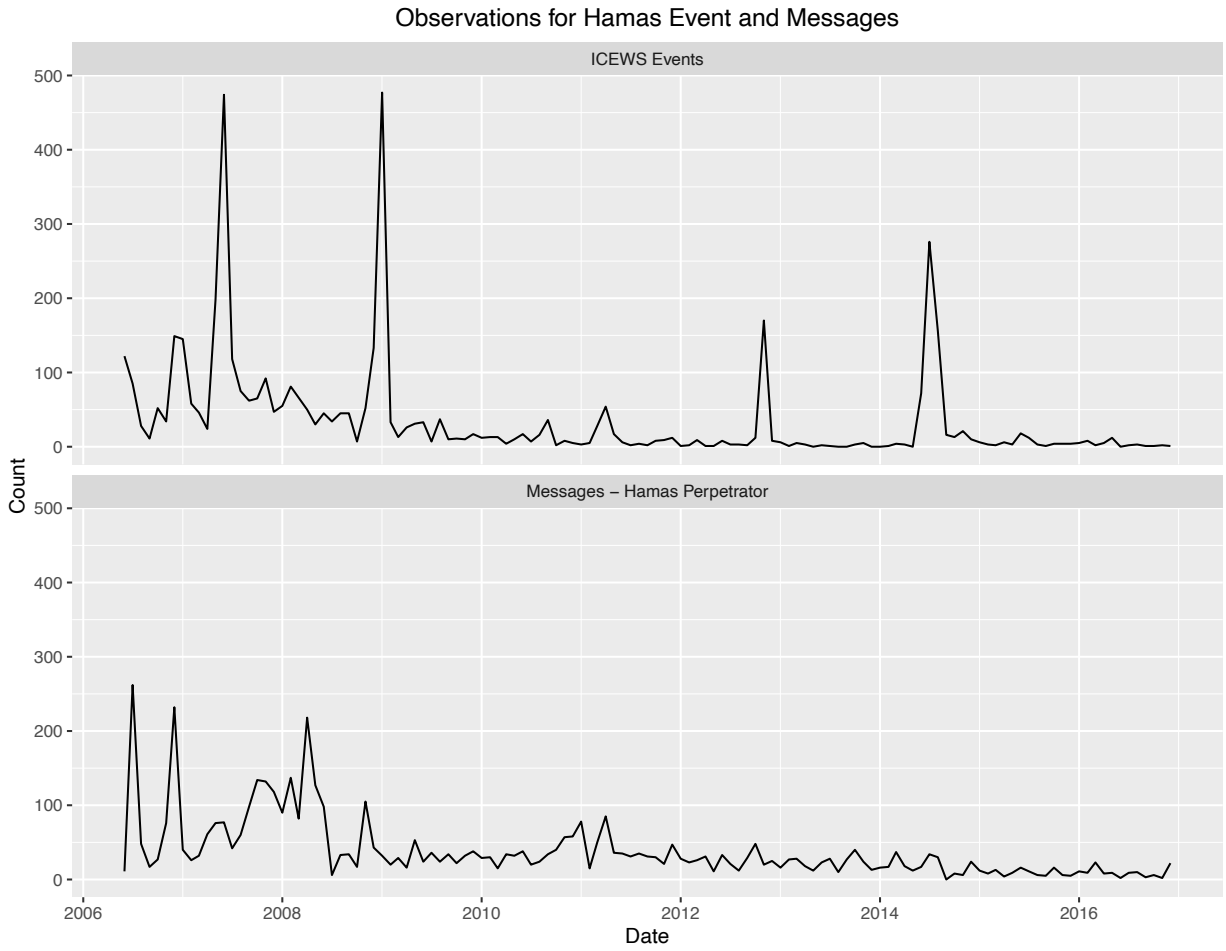


Figure 30: Number of violent events (ICEWS Event) and observations where Hamas is the perpetrator (Messages - Hamas Perpetrator).

Figure 31 aims to more closely analyze the correlation between these two sets of data. First we log both the counts of ICEWS events and messaging so that data points with large values do not overwhelm more general patterns in the data. We then create a series of lagged measures of our messaging data. The allows us to evaluate the correlation of previous months of messages on present violence. For our analysis we present the results for events and messages at the same period, as well as results were messages are lagged up to six months. The results are estimated by fitting a linear model to the observations, along with a 95% confidence interval. If messages were used as substitutes this would indicate a negative relationship which would be observed by a downward sloped line. However, in all the tests here we observe that the relationship between messaging and violent events is positive. This

is taken as evidence that violence and messaging or compliments, rather than substitutes. Importantly, the purpose here is not to suggest that messages cause groups to engage in additional violence. Future effort might employ VAR models to more fully understand the instantaneous and lagged effects of messaging on violence, similar to the work of [155].

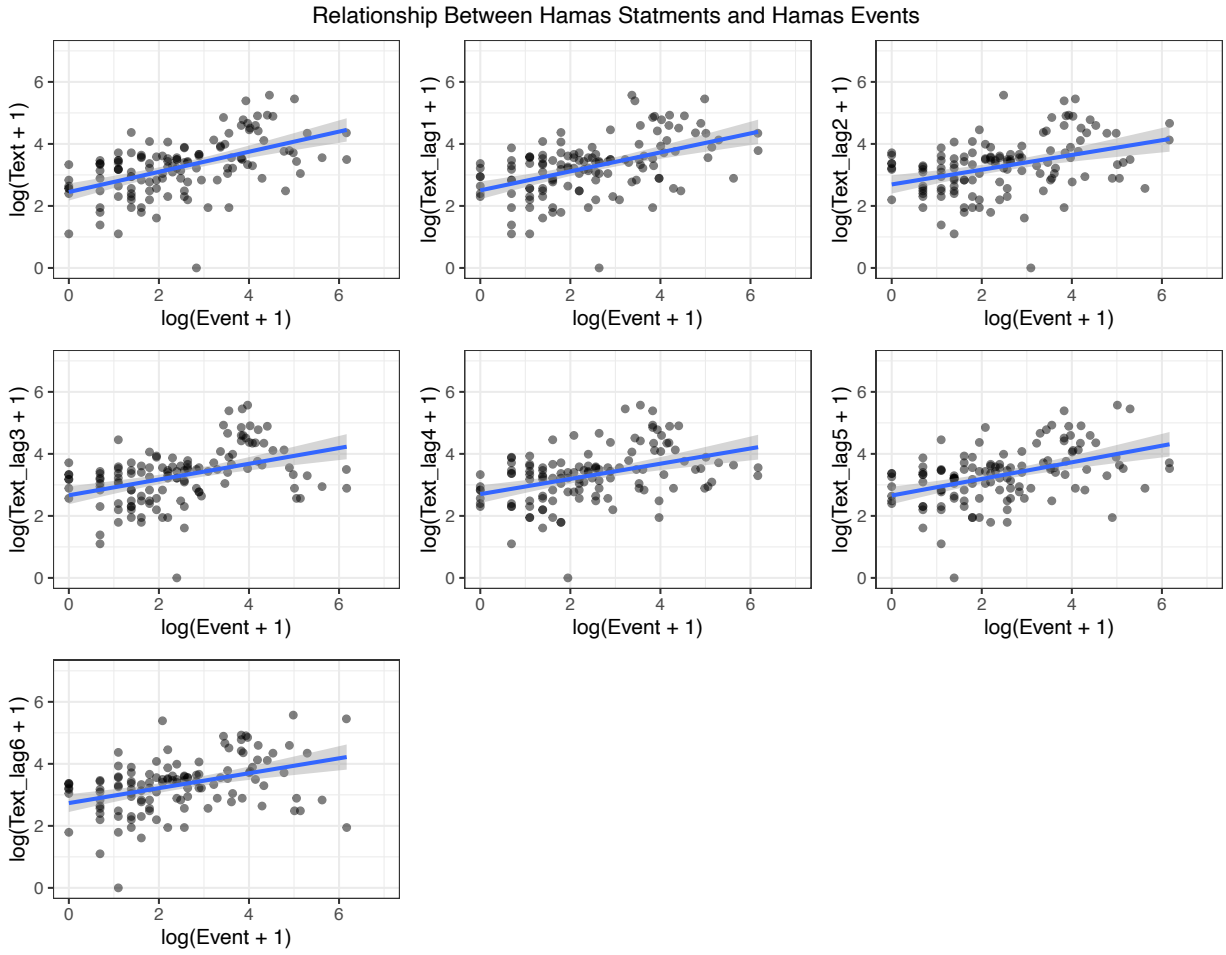


Figure 31: Relationship between statements where Hamas is the perpetrator and the number of violent events carried out by Hamas in a month. The line is a linear fit of the data. Lags up to 6 months are included for Hamas statements.

3.4 Assessing Alternative Explanations

Having now conducted a variety of evaluations dealing with the presence and scope of the battle over perceptions, it is worth summarizing how this evidence supports or refutes the various alternative explanations laid out in the theory chapter.

3.4.1 Only Violence

The first alternative explanation is that violence and messaging are substitutes rather than compliments. Figure 31 directly tests this explanation, and finds that the relationship between Hamas's messaging and their violet actions are positive, rather than the negative relationship we would expect if the alternative explanation were true. Further, we see that in a large number of cases Hamas is using their messages to draw attention to the non-violence actions carried out by their group (see Figure 25). Rather than focusing only on their violence, they also use their messages to blame Israel for the violence they conduct (see Figure 25). This evidence is consistent with our expectation that groups use their messaging to reduce the ambiguity of the actions carried out by their own group and competitors.

3.4.2 Only Attention

This alternative suggests that instead of violence and messaging being pure substitutes, it is possible that messaging is useful, but only in helping groups garner attention for their violent acts, not to promote broader political messages. Thus the expectation is that we would observe credit claims for violence, but not position taking. However, while credit claiming does make up a large share of Hamas's total messaging, Figure 23 shows that the group also engages in substantial position taking. In fact, there are dozens of months where the group engages in more position taking than credit claiming. Figures 26, 28, 29 further show the group not only claims credit or takes positions on violence, but also touts their success in Parliamentary elections and offers opinions on the prospect of engaging in reconciliation. Here we again see evidence for groups aiming to clarify the ambiguity of their group's goals through taking positions on both violent and non-violent actions.

3.4.3 Extremism

This alternative suggests it is possible that messaging is used strategically, but only in an effort to outbid rivals. Thus we would expect to see groups stake out extreme positions, favoring violence, with little efforts to moderate their positions. In Figure 29 for example we see that many violent words such as "kill" and "assault" are more likely to be opposed by

Hamas. In the same plot we see that Hamas makes the case that it is Israel that supports violence. The evidence of pointing to the violence of competitors is inconsistent with a theory that groups only benefits from extremism. If this were the case pointing to the violence of others would actually undermine one's own group. Further, while the use of justifications has not been fully explored in these results Figure 11 shows there are thousands of these justification made in Hamas's statements. Because justification aim to explain and soften potential negative perceptions of violence, they are unlikely to be observed if groups exclusively benefited from taking extreme positions or escalating their rhetoric in the face of competition.

3.4.4 Everybody Lies

The final alternative explanation aims to further probe why we should believe the statements released by violent political organizations, given that there are incentives for these groups to lie. Because the current set of tests uses the messaging of only a single group, we are unable to formally evaluate this alternative. As more groups are included we will be able to observe variation across groups. In particular observing difference in the types of messages send by groups, rather than pooling across groups, allows us to infer the organization type they aim to project to the world.

3.5 Future Work

The approach presented here allows for a new way of extracting systematic signal in the text of violent non-state actors. This allows us to see the various strategies groups engage in, the variety of aspects they mention, and crucially, the positions they attribute to themselves and their competitors. In the future we will build on the approach in several ways. First, we will include additional perpetrators within Hamas's messages, beginning with Fatah. Second, we will incorporate the messages send by rivals of Hamas, such as Fatah.[11] This allows us to make comparisons between how Hamas portrays themselves and how Fatah portrays Hamas (and vice-versa). Third, we will include actors from other conflicts. We have already collected data on groups in Northern Ireland and are in the process of gathering data on over a dozen

[11] In addition the inclusion of statements released by the Israel Defense Forces will also be explored.

additional groups, including less studied actors such as the Arakan Army in Myanmar and the People's Mujahedin of Iran (MEK).

Beyond adding to the scope of the actors included in our analyses, significant effort will be dedicated to further refining the research design. This includes coding additional training sentences for the CRF model, conducting more thoughtful feature selection, and refining the process of extracting the linked coded aspects in the dependency parse. In addition, we will more fully incorporate the information provided by the model into the results. In this implementation we have spoken little about Justifications or Slants, additional strategies used by groups. More fully investigating the use of Justifications will provide more information about how groups aim to avoid the delegitimizing effects of violence, and may provide insights into the types of actions they feel warrant a justification. Finally, investigating the use of Slants provides more information on how groups use emotive language to either motive their potential supporters, or demobilize support for their opposition.

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