ADVOCACY COALITIONS IN THE TWITTERSPHERE

Tracking Variation in Activity and Discourse in Unconventional Oil and Gas Subsystems

by

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**ABSTRACT**

Social media is continuing to be a political force shaping how policy issues are discussed and thus influencing how the policy agenda is structured. These on-line platforms allow a great variety of policy actors to collect and disseminate information. With Twitter, the information from these actors, whether they be a small non-profit or business, can ‘compete’ with the power and notoriety of well-funded organizations and corporations. Policy actors no longer must rely on the few information gatekeepers such as the media to get their message out. In the unconventional oil and gas subsystem, it is unclear how policy actors take advantage of their position in their on-line social networks to frame the issue in strategic ways and how that changes over time. The Advocacy Coalition Framework can be used to determine how coordinated policy actors engage in discursive strategies around similar policy core beliefs. Part of these strategies involve framing conversations to direct attention to certain aspects of the issue and away from others. These framing preferences, however, are likely not static as policy change can redistribute political power and incentivize changing the discourse to appeal to broader interests. In the face of real or perceive threats, coalition members will attempt to expand the issue as to encourage discursive activity among those sharing policy core beliefs. The question this research explores is ‘How do pro- and anti- coalition members frame unconventional oil and gas development and how does this change over time?’ I expect that traditional media issue frames will be used, that coalitions will use distinct issue frames, and that there will be an increase in issue frames used after a major policy change. This research uses the case studies of the hydraulic fracturing policy subsystems in New York and Colorado to explore the aforementioned phenomena. In 2014, a ban on the technique was passed into law in New York. Colorado has no similar policy.

# **Introduction**

Social media is continuing to be a political force shaping how policy issues are discussed and thus influencing how the policy agenda is structured. Online platforms allow a great variety of policy actors to collect and disseminate information and interact discursively with like-minded and opposing policy actors. With Twitter, the information from these actors, whether they are a small non-profit or business, can ‘compete’ with the resources and notoriety of well-funded organizations and corporations. Policy actors no longer rely on the few information gatekeepers such as the media to communicate their message. In the unconventional oil and gas subsystem, it is unclear how coalitions take advantage of their position in their online social networks to frame the issue in strategic ways and how that changes over time. Part of these strategies involve framing conversations to direct attention to certain aspects of the issue and away from others. These framing preferences, however, are likely not static as policy change can redistribute political power and incentivize changing the discourse to appeal to broader or narrower interests. In the face of real threat or as a strategy to exploit political momentum, coalition members will expand the types and frequency of such discursive tools.

This manuscript observes the political discourse around unconventional oil and gas development in New York and Colorado. Using Twitter as the primary data source, I monitor those active and knowledgeable about unconventional oil and gas within the social media platform, and investigate their discursive strategies through analyzing the frequency of their participation and the content of their messaging. The core research question explores how pro- and anti-unconventional oil and gas development coalitions frame the issue and how those issue frames change over time. I expect that dominant issue frames identified in previous policy process literature also dominate in coalitions’ discursive strategies on Twitter, that there is no issue frame congruence between coalitions, and that a sudden increase in the number of frames will precede major policy change.

This work finds that the same dominant frames identified in other works are present on Twitter (i.e., Dodge and Lee 2017b; Flachsland, Pahle, and Leipprand 2015; Shaw and Nerlich 2015; Yordy et al. 2019). While other discursive strategies are employed via Twitter, issue frames are very common. Between coalitions, I find little issue congruence as the anti-coalition’s strategy mostly involves positioning the conversation towards environmental and public health and safety risks while the pro-coalition directs the conversation in the direction of economic and energy development benefits. This suggests a subsystem characterized by competition and not consensus building. The findings also show that science and regulatory frames are complementary frames used in addition to the main stream, dominant issue frames. Lastly, I find evidence of an issue expansion strategy by both coalitions leading up to a major policy change.

 I will begin by exploring the theoretical framework shaping my research expectations. Then a discussion of on-line discursive strategies and the competition between dominant issue frames will follow. Next, I will explain the research design and the presentation of results. This work will end with a discussion of what was found, the limitations of my analysis, and contributions to the field.

 **The Advocacy Coalition Framework and the Role of Policy Beliefs**

The ACF is an analytical approach used to help understand how politics inform public policies (and vice versa). Unlike more traditional political science approaches, the framework recognizes the complexity of the policy process by going beyond observations of formal governing institutions (e.g., a single government decision-making venue) and incorporating a more diverse set of actors. Similar to scholarship observing ‘issue networks’ (Heclo 1978) and ‘policy communities’ (Guber and Bosso 1968), the study of advocacy coalitions seeks to broaden the iron triangle and recognize that actors outside of the US Congress, resource-rich interest groups, and the bureaucracy can be relevant and that scholars must endeavor to study the motivations of a broader set of actors, how they coordinate action (within and outside of the iron triangle), what strategies they employ and the spaces they engage to influence policy outcomes (Ingold 2011; Jenkins-Smith, St. Clair, and Woods 1991; Matti and Sandström 2011; Sabatier 1988).

The space within which these policy actors interact is called the policy subsystem. A policy subsystem is a semi-autonomous network of policy actors, confined by the policy topic and geographic area in which the policy actors make decisions (Jenkins-Smith, St. Clair, and Woods 1991; Sabatier 1987). Weible (2008) identifies three different types of subsystems. Unitary subsystems are composed of only one dominant coalition and are characterized by little conflict. Collaborative subsystems are also characterized by little conflict but include two or more coalitions. The third type, and the focus on this manuscript, is adversarial subsystems. These subsystems contain at least two competitive coalitions, with incompatible interests, who employ different discursive strategies. The nature of the policy problem, the degree of divergence in policy beliefs and the variety of available policy solutions define which type of subsystem characterizes the policy process and sets our expectations on how the policy process will unfold over time. For instance, competition over which policy images dominate discourse is more pronounced in adversarial subsystems than in collaborative subsystems because there is not consensus around key aspects of a policy issue. Another illustration of their distinction is in their use of science. Adversarial subsystems use science as a means to distribute technical information but may also weaponize it for political ends. This is much less common in collaborative and unitary subsystems.

That is not to say that conflict does not exist in unitary or collaborative subsystems. Because of US Constitutional mandates of democratic rulemaking and the existence of a Federalist system, some degree of conflict is expected and even encouraged, regardless of subsystem.[[1]](#footnote-1) However, adversarial subsystems, unlike collaborative and unitary subsystems, are characterized by a higher degree of conflict and a lack of trust that can often paralyze the policy process and lead to suboptimal policy outcomes. Referred to as the ‘contagion of conflict’ by Schattschneider (1975), the focus of this work on adversarial subsystems is part of a larger research agenda to better understand how to mitigate conflict, particularly around issues with a ‘natural’ propensity for competition and conflict.

Policy actors coordinating with other like-minded actors are considered coalition members. When conflict is high, more actors cluster into competing coalitions that advocate for a limited set of policy solutions (Jenkins-Smith, St. Clair, and Woods 1991; Wildavsky 1962). An advocacy coalition, in adversarial subsystems, has a rival coalition with whom they compete. Discursively, they compete over attention of decision-makers and the public and the meaning of relevant policy images and political symbols. This competition often manifests into sustained conflict when there are few venues of engaging those in opposing coalitions.

Beliefs are often the ‘glue’ binding coalition members together. Sabatier (1998) organizes these beliefs into a three-tiered model. Deep core beliefs, as the name suggests, refers to beliefs that act as a cognitive foundation; the justification for support or opposition of less abstract ideas such as one’s policy positions. These often are conceived as the values and morals that shape our understanding of the real world, our disposition for certain priorities and what is deemed appropriate for government intervention. For example, in shale gas development, those in favor share deep core beliefs related to the importance of resilience while those against share beliefs related to sustainability (Evensen, Stedman, and Brown-Steiner 2017). This has implications for the types of policy positions one would find appropriate and/or realistic.

Coming down one level of abstraction, the ACF argues that coalition members are aligned mainly by their policy core beliefs. That is, they largely agree on whether or not government intervention is justified and generally agree on how the problem should be defined. For example, a policy core belief of those opposing unconventional oil and gas development would be that the practice should be significantly reduced. Those in favor of unconventional oil and gas, on the other hand, believes that the practice should be expanded if economically viable.

# **Participation in a Discursive Venue**

Policy preferences of actors develop through rationalized links to policy core beliefs. Policy preferences, as a manifestation of policy core beliefs, are stable over time. One explanation for the intractable nature of policy preferences is that people are stubborn and view shifts in preferences as exhibiting vulnerability. Another explanation is that the beliefs are based on a conception of reality that runs deep in the human psyche. Underlying beliefs are rational linkages, consciously and unconsciously, to values and a moral code. To see major shifts in deep core beliefs, it is assumed that it would require a major fundamental shift in the values and morals that drive an individual’s behavior.

When they express policy preferences, political organizations and individuals make conscious decisions about how and where they see their preferences most favorable to shaping public opinion, the policy agenda, or a policy outcome (Baumgartner and Jones 1993). In the ACF, along with other policy process theories, such opportunities are referred to as venues and they are integral parts of strategy development within many subsystems (Pralle 2003). (Baumgartner 1989; P. A. Sabatier and Jenkins-Smith 1993; Wilson 2000). Choosing which venues to engage is called venue shopping. Coalition members will look for a space that offers the best prospects for reaching policy goals, to air grievances about policy status quo, and present policy alternatives (Pralle 2003). The ACF identifies decision-making venues where policy decisions are made by policy elite. Decision-making venues include city council meetings, legislative sessions, and regulatory processes.

Coalition members will choose venues based on favorable rules of engagement or the alignment of an agency’s mission with that of a given interest group (Baumgartner and Jones 1993; Holyoke, Brown, and Henig 2012). However, some coalition members find themselves shut out of traditional decision-making venues altogether and must find different ways of influencing the policy process. Outside strategies available through discursive venues are utilized instead. While they are often not linked to direct levers of power, discursive venues can indirectly influence the policy agenda by giving attention to a policy solution and/or problem. Coalition members with access to traditional decision-making venues are also present in these venues. One central goal of such strategies is to shape the views of incumbents holding various policy positions (Nohrstedt and Olofsson 2020). The participation of a broader set of coalition members in discursive venues, with and without access to traditional venues, has the potential to shape how the problem is defined or the menu of legitimate policy solutions by those active in decision-making venues.

# **Political Participation in Online Discursive Venues**

The transmission of information is particularly relevant to studies of participation as a basic level of knowledge is a prerequisite to engage in collective action through coalitions and employ coordinated discursive strategies. Different types of online political participation are utilized by different groups. Ideology, age, and socio-economic status are associated with divergence of participatory methods. The youth use social networking sites (SNS) more than other age group leading up to the 2008 US election (Bode et al. 2014). Low cost of access attracts certain groups to online activism while technical barriers keep others out. As most SNS do not charge for basic membership, many minority voices are finding their way into the collective discourse on sites such as Twitter, which often gets transmitted to other platforms. These voices can compete with the messaging of similar resource-rich allies as well as their political opponents.

Twitter allows traditionally excluded groups to engage in political discourse like few discursive venues have. O’Faircealliagh (2010) argues that broadening the discourse to allow the participation of such groups is important for policymaking as it provides an alternative set of information that can contest established convention and interpretation of the policy process. In addition, if traditional sources of information provided to policymakers have been co-opted by one coalition to the exclusion of others, there is little push back should the information be used to obfuscate or exaggerate. For instance, if local and state policymakers are learning about problems related to unconventional oil and gas development, and potential policy solutions are all championed by industry and pro-oil and gas interest groups, the discourse will be disproportionately constructed through the lens of their priorities. Environmental groups, if given the opportunity, would likely pursue alternative sources and types of information and would likely interpret findings differently.

Adversarial subsystems are assumed to be comprised of two coalitions (Weible 2008). It is assumed that as these coalitions compete, they will take on strategies of conflict expansion and containment. Schattschneider argues that different groups will engage the subsystem differently depending on their position within the subsystem as either the ‘winning’ or ‘losing’ coalition at any given point in time. The winning coalition will be incentivized to contain the issue by mobilizing their existing constituency but uninclined to advance that support beyond its current base. The losing, or minority, coalition has the opposite incentive. They will want to expand the issue to mobilize interested but unaffiliated policy actors and to energize latent coalition members.

However, the ease with which social media allows coalition members to engage their allies and supporters and shape the policy agenda may have changed the incentive structure of winning coalitions. Typically, such coalitions work to maintain and not expand their base. This is a calculated move; the result of putting their limited and valuable time and energy into strategies that have already proven to be successful. However, compared to other similar forms of discursive strategies, participation in these venues are very low cost, relative to the potential benefits attributed to impacting the subsystem discourse.

# **Issue Framing as a Discursive Strategies**

Issue framing may be a strategy as old as politics (Yordy et al. 2019). Recognition of framing as an important factor in the study of politics and policy can be traced back to Lippman’s (1922) ‘pictures in our heads’ analogy. This conceptualization is shared in later studies of ‘mental boxes’ or ‘interpretive storylines (Nisbet 2009). Framing provides the dialectic structure through which public policy issues are debated. To frame is to select “…some aspects of a perceived reality and make them more salient in a communication text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation (Entman 1993, 52).” Frames are heuristic and thematic cues used to contextualize a policy issue and orient an audience to information in a deliberate way (Lawlor 2016).

Frames resonate because of the limited cognitive capacity of all individuals to focus and process all relevant information to make a ‘completely’ informed decision (Haider-Markel and Joslyn 2001). As ‘cognitive misers,’ humans use heuristics to organize and prioritize certain stimuli while ignoring others. If we did not do this, we would be paralyzed from the inundation of information our brain is exposed to at virtually all times (Guber and Bosso 1968; Nelson, Clawson, and Oxley 1997). This ‘short cut’ is the reason why decision making in response to frames is better explained by prospect theory than the expected utility model. The utility model assumes that an individual has complete or close to complete knowledge to make an optimal decision. However, most political decisions are complex and made amidst a shroud of uncertainty, both in terms of predicting consequences but also in terms of how to measure success and failure. As such, decision-making must consider how an individual decides in situations involving risk, or in the absence of all necessary information. This explains why framing is so powerful. Tversky and Kahneman (1981) use the analogy of one’s vantage point to argue “The susceptibility to perspective effects is of special concern in the domain of decision-making because of the absence of objective standards such as the true height of mountains” (457).

Coalitions strategically use frames for two main reasons. The first is to persuade others of a given argument as to change public opinion (Jacoby 2000). How one frames the issue influences how it resonates. Kinder and Sanders (1990)’s study of affirmative action finds that alterations in how the debate unfolded during deliberation influenced changes in opinion. A change of a single word can influence such a shift. Smith (1987) finds the public to be more receptive to the term ‘poor’ than the term ‘welfare.’ Variations is the level of abstraction can also impact the persuasiveness of frames. Jacoby (2000) finds that when deliberating over government spending, more specific frames were associated with public support while general frames were not. What this makes clear is that the effective use of issue frames is predicated on choosing language that is not overly broad and must recognize the meaning of words that may be highly contextual and emotionally charged.

Second, they are used to increase or decrease conflict, depending on how they are used and by who (Pralle 2003). Schattschneider (1960) argues that the winning coalition will conduct discursive strategies of constraining conflict; mobilizing their coalition members but not expanding their reach to pique the interests of unaffiliated policy actors or the public. This will translate into the use of a narrow set of issue frames, as to prevent the mobilization of other, related interests. The strategy of the minority will be to increase conflict by mobilizing not just the current coalition members, but also unaffiliated policy actors and the public. This will translate in a broader set of issue frames being used to mobilize more interests. Conflict will manifest into a competition for influence and attention over which set of frames become the most salient.

# **Subsystem Stability and the Role of Major Policy Changes**

Policy subsystems tend to be stable through a combination of entrenched institutional forces (such as rules and norms) and countervailing political pressures from rival coalitions. When there is more than one coalition, they can act as counterweights to each other, working to leverage political influence to shape analytical debates but seldom experiencing major shifts in gaining or losing political ground. Actors within coalitions coordinate their actions towards a common goal, usually aimed at some sort of change in policy or protection of the status quo. However, some salient events have the ability to destabilize the subsystem (and coalitions and policies therein) by causing dramatic shifts in priorities, attention, and resources (Birkland 1998; Light 1982). One of the more comprehensive understandings of the impact of salient events on politics and policy comes from the literature on focusing events which can shift attention, highlight problems within a policy subsystem and bring in novel information. These dynamics can ultimately lead to major policy change (Birkland 2006). The ACF views focusing events as a potential catalyst for major policy change but further distinguishes when the impetus is exogenous or internal. Major socio-economic shifts, regime changes and spillover from other subsystems are considered external triggers while internal shocks are indicative of policy failures pursued by a dominant coalition. This provides the minority coalition with an incentive to capitalize on a window of opportunity and expand the issue (Weible and Sabatier 2005).

Yet, policy change itself can constitute an internal shock when it shifts the political composition of policy actors within the subsystem. It can increase participation and coordination as well as influence the distribution of resources within the subsystem. Major policy changes are events that have the potential to shift the political balance of power, heighten perceived threats, and affect the policy process through significant changes to rules and norms (Costie, Holm, and Berardo 2018). Our conceptualization of major policy changes is informed by feedback loops. A diverse cadre of scholars from Easton (1965) to Mettler and Soss (2004) see the policy process not as a linear model but as a dynamic, cyclical system. At its core are Schattschneider and Adamany's (1935) and Lowi's (1972) similar assertions that policy influences politics and politics influences policy. Policies shape the attitudes and behavior of policy actors and the public. They impact the policy process in four key ways; by shaping the meaning of citizenship, the form of governance, the power of groups, and the definition of policy problems (Mettler and SoRelle 2014).

Instability surrounding a policy change may be the result of anticipated or reactionary responses to a policy change, sometimes with lasting impacts. For example, coalitions can prompt a larger discussion of ideas following the passage of a policy, creating long-term changes in messaging or framing (Birkland 2006; Kingdon 2011). If a coalition is against the policy change, Schattschneider and Adamany (1975) discuss how their members might have an incentive to mobilize as a way to expand the policy problem to incorporate more actors. They also have a greater incentive to remain more cohesive than coalition members in winning coalitions as it is the best way to gain more influence (Jenkins-Smith and Sabatier 1994).

While events give significant advantage to groups interested in policy change immediately after, sustained influence is not a certainty. The window of exploitation is short lived unless skilled actors create smart strategies to amplify their message (Downs 1972; Heikkila, Weible, and Pierce 2014). After a short period of time, the salience of the issue dies down as actors no longer want to invest further resources when they see no movement has been made. It is also impacted by the fact that attention is limited and often divided amongst many issues (Jones and Baumgartner 2012). This will frequently translate into short term instability as activity and coordination will temporarily heighten when coalition members attempt to expand the issue but will die down soon after.

# **Twitter to Complement ACF Methods**

Twitter can be used to test long standing assumptions of the ACF by capturing different policy actors than are traditionally found in ACF studies. Advocacy coalition behavior has been observed through legislative hearings (Zafonte and Sabatier 2004), interviews (Weible 2005), surveys (Matti and Sandström 2011), news media (Leifeld and Haunss 2012), or some combination of those sources (Nohrstedt 2011; Stritch 2015). The aforementioned methods have been valuable for several reasons. First, they have been used to identify a broader range of policy actors. Prior, more traditional studies of policymaking, such as Poole and Daniels' (1985) analysis of roll call voting in Congress, focused exclusively on legislative behavior while neglecting non-elected officials that had political influence. Second, they can, with reasonable certainty, capture what a policy actor’s policy beliefs are. For instance, survey respondents self-report and the behavior and statements of policy actors in news media project their policy preferences and the rationale behind them (ie, Olofsson et al. 2018; Stritch 2015). Third, they can be used to see how collective action changes over time. For example, Pierce (2011) tests the stability of coalitions through analyzing legislative testimony around US foreign policy during two periods, 22 years apart.

Surveys are some of the most common data sources because of the strengths described above. However, Sabatier and Jenkins-Smith (1993) identify several weaknesses that future researchers should heed. First, they are rarely longitudinal. Second, it is difficult to decide who should be surveyed to get an accurate account that can be generalized to the entire population of interest. Third, surveys offer less flexibility as they tend to be highly standardized, making it hard to adapt and change the research design once the study has begun. Fourth, surveys are vulnerable to reactivity as respondents’ answers can change based on the presence of the researcher (or other environmental conditions). Lastly, surveys tend to rely on reports of behavior rather than observations of behavior (Singleton Jr. and Straits 2010).

This is not to say that surveys do not provide insight. It is to say that social networking sites like Twitter provide a different picture of coalition activity within discursive venues that are often overlooked by traditional research designs. By identifying policy actors on Twitter, scholars and analysts capture coalition attributes that surveys alone cannot such as frequency of activity, variation of political messaging, and evidence of association and information sharing. In addition, a Twitter-supported data acquisition method offers the ability to capture the entirety of discourse in the venue and over the entire ‘life’ of the subsystem, it allows for more flexibility about how the researcher captures phenomena of interest such as political strategies, it removes the researcher from any influence on the ‘subject,’ and it captures first-hand observations of discursive behavior.

# **Unconventional Oil and Gas Development in the United States**

Hydraulic fracturing, often associated with horizontal drilling, refers to a completion technique that injects high pressure liquid into a rock formation until it fractures (Cook et al 2018). The amount of water used varies depending on the rock formation. The amount can range from 1.5 million gallons per well in the Bakken formation to 5.7 million gallons per well used in the Haynesville formation (Nicot and Scanlon 2012). This process causes oil and gas deposits to be released from the shale play. Due to technological innovation, these formerly off limit shales have become accessible and economical (Finkel and Hays 2013).

With the increased use of hydraulic fracturing, the United States has been the world’s top producer of oil and gas since 2009 (Cook et al 2018). It became popular because of high energy prices, the desire to increase national energy independence, and advances in tech that made the process more economical (Wang and Krupnick 2013). The United States holds the largest reserves of shale oil and the fourth largest reserves of shale gas in the world (US Energy Information Administration 2013). In 2000, this technique only produced 1% of natural gas production. By 2017, that figure increased to 60% of dry natural gas (Cook et al 2018). Oil production also increased during this time from 6 million barrels of oil per day in 2000 to 12.23 million per day in 2019 (Geary 2020). The United States has gone from being one of the world’s largest importers of oil and gas to becoming energy independent (Wang et al. 2014). The success of the unconventional shale and gas industry in the US has generated much interest abroad from countries holding large reserves of their own.

Supporters of hydraulic fracturing point to several benefits to the practice. First, the exploration, construction, and extraction of oil and gas is a job creator for local economies, especially in rural areas who have been economically depressed for decades. This can also be a boon for local governments in desperate need of tax revenue (Kay 2011). In addition, it can be an additional income source for landowners (Clarke et al. 2015). Lastly, there are macro-benefits that are often celebrated. The role of increased oil and gas production keeps the United States less dependent on foreign sources and can reduce the energy costs of the individual consumer (USEIA 2014). The ‘clean’ natural gas is also used to argue that the practice creates a more environmentally friendly alternative to coal (Moskowitz 2015).

While advocates of oil and gas discuss the economic advantages of unconventional oil and gas development, there are distinct challenges that are raised by opponents. Environmental concerns are not only due to the amount of water used but also the impacts of unconventional oil and gas development on land use, animal welfare, air quality, water contamination, and its link to seismic activity (Davis 2012; Ellsworth 2013; Urbina 2011; Bamberger & Oswald 2015). Konkel (2016)’s study of drinking water on indigenous lands found that the practice created 1 million gallons of wastewater, it went into the soil, and killed vegetation. Air quality analyses are often related to methane emissions, despite proponents of hydraulic fracturing messaging natural gas as a ‘clean’ alternative (Moskowitz 2015). Several scholars have found that the injection of fluid can increase pressures within the pores of deep rock formations which, in turn, can generate earthquakes (Hand 2015; Gallegos et al. 2016).

Sometimes overlapping environmental concerns, public health and safety are also common. Communities around developments run higher risks related to air pollutants, ground water contamination, truck and traffic noise pollution, and psychosocial stress. For workers, the risks are more acute and result in lower mortality rates due to exposure to hazardous material and industrial malfunctions and accidents (Adgate, Goldstein, and McKenzie 2014). Social costs of rapid population growth and the loss of community are also linked to the impact of hydraulic fracturing (Clarke et al. 2015). Economic concerns, while observed less directly, related to the cost of cleanup are also prominent (Joyce and Wirfs-Brock 2015).

Partially due to disagreement about the severity and promise of the aforementioned risks and benefits, conflict is viewed as a central component to both conventional and unconventional oil and gas subsystems (Weible et al. 2016). It has been observed across the state and across the country (Becker and Werner 2014; Chailleux and Moyson 2016; Rabe 2013). Disagreement stems from dispute over whether a problem exists, how that problem should be solved, and who exactly should solve it. Conflict related to unconventional oil and gas development could be a battle of which level of government has authority. In Colorado, for instance, it can be found around competing claims of state and local regulatory rights (Heikkila, Weible, and Olofsson 2017; Rabe 2013). Whereas in New York, the debate was more focused on how the state should govern, not if they should govern. Both cases, however, demonstrate a significant degree of conflict, and are adversarial in nature.

Within these conflict-prone subsystems, there is variation in the amount of resources and political influence each coalition wields. Colorado is one of twenty-seven US states with shale oil deposits. In 2009, Colorado ranked sixth in natural gas production. How to regulate unconventional oil and gas development in Colorado has been a contentious political issue (Davis 2012). Public debates about unconventional oil and gas development have often pitted environmental groups, community organizations and local government agencies concerned about pollution and public health against state governments and extractive industries looking to increase tax revenue and profits (Heikkila, Pierce, et al. 2014). The Colorado Oil and Gas Conservation Commission (COGCC) was created in 1951 and was charged with representing the interests of Colorado oil and gas to business and other interests outside the state (Ray & Hutchins 2017). Their role courting industry was expanded to include regulation to protect health and the environment (Heikkila, Weible, and Pierce 2014). These countervailing missions have caused many to question which will get prioritized when they come at odds. For the past decade, former Governor and oil and gas geologist John Hickenlooper has been perceived by many to be a proponent for the oil and gas industry, along with a series of Republican and Democratic legislatures that oversaw a dramatic increase in unconventional oil and gas (Woodruff 2019).

Perhaps the most significant state policy that anti-unconventional oil and gas policy actors could qualify as a victory came with the adoption by the COGCC in 2011 of a rule requiring the disclosure of chemicals used in the unconventional oil and gas development process. Activists celebrated this as a step in the right direction. However, they still had to compromise by allowing companies to protect some proprietary information (Proctor 2011). The anti-unconventional oil and gas crowd has experienced a series of setbacks in recent years. In 2016, the Colorado Supreme Court struck down several municipal and county unconventional oil and gas bans, arguing that it is the state’s right to regulate the industry, superseding any mandate by local governments (Turkewitz 2018).

In New York, influence of policy actors and impacted areas are distributed differently. Eighty-four trillion cubic feet of natural gas can be found in the western region of the state called the Southern Tier (Esch 2012). At the turn of the century, there was a lot of enthusiasm around the prospect of unconventional oil and gas development, particularly in the economically deprived western region. The shale boom was expected to bring in 54,000 jobs and increase state and local revenues by $32-126 million (Arnold and Neupane 2017). By 2003, land leases to oil and gas companies were being signed (Dodge and Lee 2017a).

The promise of extraction would prove to be short lived. Governor Paterson imposed a moratorium on unconventional oil and gas development in 2008. After 2008, at least 331 policies and resolutions were passed related to unconventional oil and gas development at the local level and at least 200 anti-unconventional oil and gas development groups were formed (Arnold and Long 2017). In December of 2014, that was followed up with a total ban on unconventional oil and gas development in New York, making the state only one of two to have banned it (Sabatier and Weible 2016). Unconventional oil and gas development had been one of the most divisive issues in New York politics in years. While conflict may be high, it is clear that institutional support and mobilization of anti-unconventional oil and gas interests are behind the most significant policy change around unconventional oil and gas in United States history.

# **Research Questions and Hypotheses**

The overall research question of this chapter is ‘how are issue frames used by coalitions in the unconventional oil and gas subsystem and how do they change over time?’ This manuscript looks at variance in messaging. While there are other discursive strategies that coalition members can utilize, the persuasive power of dominant frames will make them hold a prominent place in the discursive venue. In similar energy and environmental subsystems, issue frames have been identified in analyses of debates and newspaper coverage (Dodge and Lee 2017b; Flachsland, Pahle, and Leipprand 2015; Shaw and Nerlich 2015; Yordy et al. 2019). They relate to economics, public health and safety, energy independence, the environment, and use of science. This chapter tests to assess the degree to which those issue frames are used on Twitter. The first hypothesis is:

1. ***Online Discursive Strategy Hypothesis:*** *Use of dominant issue frames in newspapers will be a prominent discursive strategy employed by coalitions on Twitter.*

In adversarial subsystems, there is very little policy belief congruence between coalitions. This will translate in the exclusive use of different issue frames. The anti- coalition is expected to focus on the dominant *risk* issue frames, specifically, risks to the environment and to public health and safety. The pro- coalition is expected to focus on the dominant *benefits* related to the economy and energy development. The second hypothesis is:

1. ***Issue Frame Congruence Hypothesis:*** *The anti- coalition will exclusively use dominant risk frames and the pro-coalition will exclusively use dominant benefit frames.*

In addition, these subsystems are composed of two coalitions competing for issue salience leading up to a major policy change. Because the cost of participation is so low, both coalitions are incentivized to expand the issue before such a policy change. The third hypothesis is:

1. ***Issue Frame Stability Hypothesis:*** *There will be a dramatic increase in the frequency of dominant issue frames immediately before a major policy change.*

# **Methods**

# **Source**

Twitter is the primary data source for this manuscript. Twitter’s mission is “to give everyone the power to create and share ideas and information instantly, without barriers” (Twitter.com). The site has 313 million active users of which 91% allow their posts to be open to the public (Mislove et al. 2011). Studies of Twitter data have found that there is a high degree of mutual acquaintances among users (Shi, Tseng, and Adamic 2007). Because it is public, Twitter’s ties are more diverse than other social media platforms such as Facebook and information is more easily accessible for people outside of one’s immediate network. The data are discursive in nature but utilizes a variety of communication tools such as mentions ‘Likes’ and ‘Retweets.’

# **Case Selection**

 The unconventional oil and gas subsystems of New York and Colorado, United States will be the focus of this study. Following Seawright and Gerring (2008)’s Purposive Case Selection method, I am interested in structuring a case study comparison of an extreme with a ‘normal’ case. The extreme characteristic related to my research question is a major policy change. In New York, there has been an outright ban while other subsystems have experienced only minor policy changes. In line with the aforementioned scholars, such an approach is exploratory in nature; to understand how an extreme treatment impacts key variables.

# **Data Collection**

 Data collection occurred in three steps. The first step involved the identification of policy actors in the subsystem. I identified policy actors a priori using the results of two sampling processes conducted by the Workshop on Policy Process Research (WOPPR) at the University of Colorado Denver. WOPPR is a research lab focused on using diverse theoretical lenses and methodological approaches to understand how public policy is designed and implemented. The purpose of this particular project was to capture and analyze actors who were actively involved or knowledgeable about unconventional oil and gas development in New York and Colorado. The survey in New York was conducted in 2017. In Colorado, the survey was conducted in 2014. Through a purposive sampling approach based on evidence in media reports, online reports, public hearings, testimony and recommendations from interviews, WOPPR scholars identified 930 individuals and organizations working to shape policy around unconventional oil and gas development in those respective states (Heikkila and Weible 2015, 2017; J. Pierce 2013). In New York, 379 policy actors were identified. In Colorado, 551 policy actors were identified. During the second phase, I cross referenced the 930 individuals and organizations to identify which of those policy actors had active Twitter accounts.[[2]](#footnote-2) Of the 930 total policy actors within the two subsystems, 335 accounts were identified. [[3]](#footnote-3) The last step utilized programming software to ‘call up’ tweets from Twitter’s Application Programming Interface based on a set of parameters. The 335 Twitter handles were then paired with keywords “hydraulic fracturing,” “unconventional oil and gas development,” “unconventional oil and gas,” “shale gas,” “shale oil,” “unconventional oil,” “unconventional gas,” and “stimulation.” The queries originally collected all tweets with the aforementioned keywords made by the identified Twitter accounts from 2009 to 2016.[[4]](#footnote-4) [[5]](#footnote-5)

# **Data Measurement**

Coalition membership was measured by identifying a policy position in the content of an original post during within two years of the major policy change or by evaluating their mission statement on their website as of August of 2019. It is assumed that policy core beliefs such as support or opposition to unconventional oil and gas are relatively stable. Because of this, one instance of a policy position was sufficient to determine coalition membership. Policy actors were coded as pro-, anti-, or unaffiliated based on their policy position related to unconventional oil and gas development, also referred to as hydraulic fracturing or ‘fracking.’ A “pro- coalition” member would be coded if the actor expresses in a tweet that they were supportive of unconventional oil and gas development. A supportive tweet can come in the form of stating that the actor wants to see unconventional oil and gas continued or expanded. It could also be through their professed actions. Supportive actions can be identified if the policy actors talk about engaging in drilling or unconventional oil and gas wells, investing in unconventional oil and gas businesses, collaborating with the oil and gas industry on researching unconventional oil and gas technologies, exploring a shale formation, or taking political actions that represent support (e.g. testifying in a public hearing that unconventional oil and gas is beneficial, safe, or “good” in some way), etc.

The “anti- coalition” policy position would be coded if the actor expresses in the tweet that they are in opposition to the level of unconventional oil and gas development, want to see the practice ended entirely, or if the tweet describes the actor’s actions in a way that makes it clear that the actor is opposed. For example, an “opposing” tweet could come in the form of stating that no more wells should be drilled, or they support an end to fracking. Opposing “actions” would be identified if the author talks about attempts to stop or limit unconventional oil and gas such as protesting at a public event, by testifying before Congress on problems related to unconventional oil and gas, or talking about collaborating with other organizations.

# **Data Analysis**

I focused the analysis on the six weeks leading up to the major policy change (November 1st, 2014 to December 16th, 2014) and the six weeks that followed (December 17th, 2014 to January 31st, 2015). The ban on unconventional oil and gas development constitutes a major policy change. Two thousand tweets were coded before the major policy change and 2,416 were coded after, for a sample of 4,416 tweets. Intercoder reliability was conducted over three rounds with two coders to ensure internal validity. Each round of intercoder reliability checks increased the percentage of agreement on whether an issue frame existed in a tweet and which issue frame is being used.[[6]](#footnote-6)

The next step was to code the text of a given tweet. Twelve frames were identified a priori based on issue frames used in past empirical works studying the oil and gas subsystem (Dodge and Lee 2017b; Flachsland, Pahle, and Leipprand 2015; Olofsson et al. 2018; Yordy et al. 2019). Risks and benefits related to the economy, safety, health, environment, and energy development have been frames identified in past literature. Scientific information is often employed to support or oppose unconventional oil and gas as well (Zilliox and Smith 2018). The issue frames *risk of regulation/ban*, *benefit of regulation/ban, Experts and science in opposition to unconventional oil and gas and Experts and science in support of unconventional oil and gas* were created after an initial review of the tweets was conducted. The 4,416 tweets were then coded manually by the primary investigator using the established codebook from the intercoder process. See **Appendix A** for conceptual definitions of the issue frames.

# **Results**

Before presenting results related to the online Discursive Strategy Hypothesis, a brief overview of the other types of political messaging present in the data is helpful. Issue framing is not the only way in which political messages are communicated via Twitter. There are political tweets that highlighted decision-makers who were for or against unconventional oil and gas and public opinion polls (‘New poll shows x% of New Yorkers approve of y’). Also, many tweets are words of encouragement, thanking decision-makers and other policy actors for their work in the policy process (‘Thank you, Governor Cuomo’). Some tweets provide updates on some technical or tangential aspect of unconventional oil and gas (‘Shale gas pipeline moving from x to y’). Others are statements of policy positions without an issue frame attached (‘Go Frack Go!’). Still others are calls to action (‘Please sign this petition to ensure that x happens’). Lastly, science is invoked but is done as a way to discredit the source or to indicate the inconclusiveness of scientific inquiry.

Results also show that dominant frames do play a role on Twitter. **Tables 1** provides some illustrative examples of dominant frames in use. Several points are worthy of noting from this sample. First, both coalitions use events outside of the New York subsystem to construct a frame relevant to the New York subsystem. The anti-coalition references Montana and their constitution to highlight the environmental impacts of unconventional oil and gas. The pro-coalition references the Colorado subsystem, creating a public health and safety frame through highlighting that families can be assured that unconventional oil and gas is being conducted responsibly. Second, when both coalitions use the opposition’s dominant frames (i.e., the economy and energy development for the anti- coalition; the environment and public health and safety for the pro- coalition), they are often utilized in relative terms. For instance, the anti-coalition’s use of a policy risk related to unconventional oil and gas is not constructed to argue that any policy comes with risks. It is largely used to argue that the current policy does not go far enough. The same theme is identified when the pro-coalition uses *environmental benefit* and *public health and safety benefit* frames. These policy actors are arguing that unconventional oil and gas is beneficial to the environment, health, and safety relative to other practices inferred to be riskier. Third, policy actors layer text with other discursive tools such as hashtags and ‘@.’ Embedding these into the text creates a more interactive network that links related tweets to each other. Lastly, of the tweets with an issue frame, 45% of the anti-coalition tweets and 41% of the pro-coalition tweets use two or more issue frames. For instance, the pro-coalition’s use of ‘science in support’ argues that a study found that unconventional oil and gas chemicals are safe relative to other common household items. This constitutes both a science and public health and safety frame.

**Table 1: Dominant Frames in Use**



As further evidence of dominant issue frames being used on Twitter, **Tables 2 & 3** show that over a 3-month period surrounding the major policy change, the dominant frames are used in New York and Colorado, however in different frequencies. In New York, 2,078 instances of issue frames are captured. The anti-coalition make up the majority at 64% and the pro-coalition make up 35%.[[7]](#footnote-7) In Colorado, 1,498 instances of issue frames are captured. The anti-coalition and the pro-coalition in Colorado are much more balanced in their use of issue frames with the former representing 54% and the latter representing 44%.[[8]](#footnote-8)

Within the pro-coalition, the vast majority of frames relate to economic benefits and energy development benefits. In the anti-coalition, environmental and/or public health and safety risk are the most frequently used frames. Across coalitions, the anti-coalitions use science as a frame 23% more often than the pro-coalition.

Addressing the Issue Frame Congruence Hypothesis, there are some mixed findings. By and large, the anti- coalitions use risks related to unconventional oil and gas and benefits related to policies addressing the practice. The pro- coalition predominately sticks to unconventional oil and gas benefits and policy risks related to the practice. An exception is that the anti-coalitions also express risks to policies as they push for their policy positions. In addition, while there is some evidence of opposing coalition members using the issue frames of the opposition, there is much greater evidence that the dominant issue frames of coalitions, as identified in past scholarship, are utilized by the respective coalitions much more often. The pro- coalition uses frames related to the economy and energy development 71% of the time. The anti-coalition uses frames related to the environment, public health and safety, and the use of science 87% of the time.

**Tables 2 & 3 - Issue Frames Before and After Ban**

*New York*

|  |  |  |
| --- | --- | --- |
| New York | Anti | Pro |
| Before | After | Before | After |
| **Economic** | Risk | 15 | 18 | 2 | 2 |
| Benefit | 1 | 0 | 124 | 175 |
| **Environmental** | Risk | 213 | 246 | 0 | 0 |
| Benefit | 4 | 0 | 22 | 44 |
| **Energy Development** | Risk | 38 | 27 | 0 | 0 |
| Benefit | 1 | 0 | 103 | 108 |
| **Public Safety and Health** | Risk | 181 | 198 | 0 | 0 |
| Benefit | 0 | 0 | 15 | 0 |
| **Policy** | Risk | 4 | 7 | 5 | 55 |
| Benefit | 8 | 60 | 0 | 0 |
| **Use of Science** | Opposition | 166 | 139 | 0 | 0 |
| Support | 0 | 0 | 36 | 33 |
| Total |   | 631 | 695 | 307 | 417 |

*Colorado*

|  |  |  |
| --- | --- | --- |
| Colorado  | Anti | Pro |
| Before | After | Before | After |
| **Economic** | Risk | 5 | 18 | 3 | 2 |
| Benefit | 1 | 0 | 119 | 132 |
| **Environmental** | Risk | 152 | 188 | 0 | 0 |
| Benefit | 4 | 0 | 34 | 43 |
| **Energy Development** | Risk | 33 | 21 | 1 | 0 |
| Benefit | 1 | 0 | 88 | 81 |
| **Public Safety and Health** | Risk | 136 | 134 | 0 | 2 |
| Benefit | 0 | 0 | 20 | 0 |
| **Policy** | Risk | 4 | 5 | 6 | 53 |
| Benefit | 7 | 19 | 0 | 0 |
| **Use of Science** | Opposition | 33 | 55 | 0 | 0 |
| Support | 0 | 0 | 42 | 26 |
| Total |   | 376 | 440 | 313 | 339 |

**3.1 Issue Framing Over Time in New York**

To test the temporal aspect of this work, this chapter analyzes the frames used in 1-week increments. The Issue Frame Stability Hypothesis expects that issue expansion will occur in both coalitions leading up to a major policy change. **Graphic 3.1** show the changes in total tweets over time by week. Periods ‘-6’ to ‘-1’ represent the six weeks leading up to the policy change on December 16th, 2014. Periods ‘1’ to ‘6’ represents the six weeks after the policy change. The graphic illustrates that there is indeed an increase in issue framing leading up to the policy change in New York. This also shows that leading up to the policy change, both coalitions utilized issue framing more than they had in the five periods leading up to the change, followed by a marked decrease in issue framing. This reduction is more pronounced with the anti-coalition than the pro-coalition. Leading up to the policy change, anti-coalition’s use of policy benefits exhibited the greatest increase in frequency. For the pro-coalition, the greatest increase leading up to the policy change is seen in economic benefit frames[[9]](#footnote-9).

# **DISCUSSION**

This manuscript asks, ‘how are issue frames used by advocacy coalitions and how does this change over time?” Partially confirming the first hypothesis, I find that dominant issue frames are a strategy employed by both coalitions. The frames that have been found in debates and newspapers are very salient on Twitter. This reinforces Guggenheim et al. (2015)’s claim that there is a feedback loop between traditional media sources and Twitter. I also find that outside events are used to construct issue frames. This is further evidence that the physical boundaries that separate subsystems are at least porous enough for homogenous political messaging to reach audiences in different cities and has the potential to influence the policy processes in distant locations. A final observation of how coalition members in the unconventional oil and gas subsystem use issue frames is that they are often used in conjunction with other issue frames. The platform limits communication to 240 characters. As a result, typical messages are not terribly nuanced, and it often takes users several tweets to convey a complex message. Because of this, it is surprising to see relatively complex issue frame construction in a single tweet.

Findings related to issue congruence are mixed. In general, there is little issue congruence. All coalitions did use the *risk of policy* frame, but the anti-coalition uses it when arguing that the policy did not go far enough, or the policy was not being enforced. Like-wise, the pro-coalition uses it by arguing the issue of enforcement (i.e., ‘we don’t need new laws, we just need to enforce the ones we have) but never arguing that the policy did not go far enough. Just as often as the enforcement argument, *risk of policy* is often coupled with economic and energy development issue frames.

The anti-coalition is much more likely to use environmental and public health and safety risk issue frames than economic and energy development risk issue frames. The pro- coalition is much more likely to use economic and energy development benefit frames than environmental and public health and safety frames. The high degree of issue incongruence reinforces the notion that policy actors are not ‘talking to each other’ by speaking on similar issues. While there is some evidence of all eight being used, the propensities described above further suggests that there is a considerable amount of conflict in the subsystem as opposing coalition members still disagree on what topics and problem definitions should be prioritized.

Lastly, the Issue Framing Stability Hypothesis was confirmed. There was an increase in framing leading up to the major policy change. This provides some evidence that there were strategic efforts to mobilize coalition members leading up to the ban. What had lagged, however, was discussion of *benefits* or *risks of policy* frames used by the respective coalitions. This suggests coalition members are shifting not only the frequency of issue frames but also the selection of issue frames in response to the policy change.

# **CONCLUSION**

 The objectives of this work were three-fold. First, this work was conducted to explore how discursive strategies are employed online. The use of online platforms like Twitter for coordinated political action has increased over the past fifteen years and will only grow in popularity as more people use the internet for political engagement. In the lead up to a national election during a pandemic, coalitions are likely to see this as an ideal way of engaging other policy actors as well as their constituencies which could easily remain a best practice long after the pandemic has ended. This manuscript works to better understand how discursive strategies are employed online as their use is expected only to grow. Second, I am interested in understanding the role that conflict plays in adversarial subsystems. Adversarial subsystems are those that have a higher propensity for conflict than other subsystems. It speaks to the nature of the policy process therein, whether there is space for compromise between dominant policy positions, the amount and types of venues for resolving disputes, and the history of conflict and compromise in the subsystem. However, within an adversarial subsystem, the degree of conflict varies. Tension between actors can grow leading up to a major policy change. This work is interested in looking at two adversarial subsystems with differing levels of conflict. Lastly, I am interested in looking at how discursive strategies change as the result of a major policy change. It is assumed that coalitions will respond differently based on whether they are winning or losing and whether they perceive that their interests are being threatened. Studying issue framing, my work provides additional insight into how policy actors respond and when.

One limitation of this research is that abstract and informal language posed a challenge to accurately identifying whether or not a frame was present. Twitter’s limited textual capacity leads users to use colloquial terms or make sweeping statements that, without appropriate context, is difficult to assess. The chief instance of this is when assessing the risk/benefit of policy. It may be underrepresented in my analysis as some tweets express broad sentiments following the major policy change but only posted something like ‘Good work, governor! We are now a healthier state.’ This issue is mediated by evaluating additional tweets from the coalition member which provided additional context. In the instance of the most common case described above, these statements are always made after the policy change and not before and largely fade away shortly after the policy change.

A second limitation is the extent to which social media reflects meaningful association and coordination. Information transfer amongst policy actors may be overstated. One entrenched weakness of the ACF is its inability to draw the line between what is meaningful coordination and what is not. More explicit and visible displays of collective action are easily identified but there are many other behaviors of successful coalitions that are not as easy to measure. Many studies have confirmed that online discourse does reflect off-line behavior related to voting, protesting, and even revolution (O’Conner et al 2010; Costanza-Chock 2008). As more and more people shift their civic engagement to online platforms, especially during the lead up to a presidential election in a pandemic, the more likely that those associations will manifest into real changes to the policy agenda vis-à-vis alignment of a coalition’s discursive strategies and shifts in public opinion.

A final limitation is the impact of exogenous factors on the results must be recognized. An external factor that could have played a role in the major reduction in activity after the policy change is dynamics of the energy market more broadly. Between 2014 and 2015, the price of a barrel of oil dropped from 87.39 USD to 44.39 USD (USEIA 2020). With such low prices, hydraulic fracturing has become less economically tenable in many parts of the country. Fewer wells are being drilled and the conflicts associated with such development may be neutered for the time. Such changes could have reduced salience of the issue. However, drilled wells continue to be active, and those coalition members who have much to gain or lose once it becomes viable again still have a stake in shaping discourse around these issues.

This work shows that issue frames are a common discursive strategy in at least two unconventional oil and gas subsystems. As coalitions compete within this discursive venue, there is greater utilization of distinct issue frames to advance policy positions. This issue incongruence indicates that the subsystem is more characterized by conflict than by consensus. In addition, I find that the use of issue framing comports with the theory of issue expansion.

This manuscript contributes to the study and practice of policymaking in a variety of ways. Methodologically, this work uses Twitter both as an online venue and as a data source. Past ACF applications have used newspapers and surveys to determine coalitions and observe behavior. This work was able to look directly at behavior (as opposed to reported behavior) and do so over time. While several ACF works use Twitter to observe relevant discourse, they do not look at the totality of the discourse over time and across a significant amount of active coalition members.

Theoretically, this work contributes in two key ways. First, it provides additional insight into how the ACF should conceptualize a policy subsystem. While all politics may be local, those politics can be strategically used across subsystems, blurring the boundaries between them. National players such as the American Petroleum Institute and Earthworks have influence in discursive venues even if they are not ones with local knowledge or ‘boots on the ground.’ Discursive venues like Twitter allow for events in different geographic locations relevant to policy actors in the New York subsystem to be distributed through the coalition’s network. As the use of the internet increases, the physical boundaries separating subsystems may need to be rethought or perhaps rejected entirely.

The second theoretical contribution relates to how we conceive of conflict in adversarial subsystems. It is assumed that if conflict is observed, it is an adversarial subsystem. This understanding is incomplete in that every subsystem in a democratic society has some degree of conflict and that conflict can be healthy. Similarly, there are varying degrees of conflict in an adversarial subsystem. This work acknowledges this nuance by providing evidence of two adversarial subsystems characterized by varying degrees of conflict.

The last contribution relates to the practice of policymaking. My manuscript directs attention to ways in which we can build more inclusive policy processes. Lasswell (1951) argues that the purpose of studying the policy process is to improve democracy. In order to do that, we need to identify better, more efficient, and more innovative ways to include a broader range of interests in the policy process. Social media platforms have historically facilitated inclusion and will likely continue to grow in popularity. Still, more work needs to be done to have a better understanding of the relationship between conflict and inclusion and how online discursive venues demonstrate promise at bringing attention to disenfranchised voices so that their interests can be represented through policy.

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# **APPENDIX A**

**CONCEPTUAL DEFINITIONS OF ISSUE FRAMES**

1. *Economic risk.* The actor suggests that he/she believes unconventional oil and gas to have economic risks. For instance, statements about how unconventional oil and gas disrupts regional economies, negatively affects tourism and jobs, favors concentration of income in favor of corporations, public officials appealing to industry groups over citizens, or sucks up public resources that could be used in other sectors
2. *Environmental risk.* The actor suggests that he/she believes unconventional oil and gas to have environmental risks. For instance, statements about how unconventional oil and gas can result in contamination of groundwater or surface water, lead to earthquakes, affect biodiversity/displace species are examples of environmental risk.
3. *Public safety and health risk.* The actor suggests that he/she believes unconventional oil and gas to have risks associated with community safety and health such as contaminated drinking water or an explosion at a well site. Violence and war can be interpreted as risk to public safety and health.
4. *Energy development risk.* The actor suggests that he/she believes unconventional oil and gas to be a risk to energy development and independence. For instance, statements about national security, energy independence, or large-scale production of oil and gas using unconventional oil and gas (at least in part).
5. *Risk of regulation/ban.* The actor suggests that a current or upcoming regulation, moratorium, or ban related to unconventional oil and gas would have negative impacts on society, the economy, etc.
6. *Experts and science in opposition to unconventional oil and gas*. The actor uses scholarly works, data, or statistics in opposition to unconventional oil and gas or the actor uses material created by experts.
7. *Economic benefit.* The actor suggests that he/she believes unconventional oil and gas to have economic benefits. For instance, statements about market prices ($/barrel of oil, price of solar panels, stocks of energy businesses, etc.), how unconventional oil and gas favors jobs creation, injects money in local communities, improves the financial health of local and state level governments, etc. are considered examples of economic benefit.
8. *Environmental benefit*. The actor suggests that he/she believes unconventional oil and gas to have environmental benefits OR if the actors state that unconventional oil and gas is “safe” for the environment
9. *Public safety and health benefit*. The actor suggests that he/she believes unconventional oil and gas to have benefits associated with community safety.
10. *Energy development benefit*. The actor suggests that he/she believes unconventional oil and gas to encourage and/or catalyze energy development and independence. For instance, statements about national security, energy independence, or large-scale production of oil and gas using unconventional oil and gas (at least in part).
11. *Benefit of regulation/ban.* The actor suggests that a current or upcoming regulation, moratorium, or ban related to unconventional oil and gas would have positive impacts on society, the economy, etc.
12. *Experts and science in support of unconventional oil and gas.* The actor uses scholarly works, data, or statistics in support of unconventional oil and gas, or the actor uses material created by experts (i.e., articles written)

# **APPENDIX B**

**STATISTICAL SIGNIFICANCE OF ISSUE FRAMING OVER TIME**

*t-Test: Two-Sample Assuming Equal Variances*

|  |
| --- |
| Anti- Coalition New York |
|  | *Before* | *After* |
| Mean | 98.66667 | 103.8333 |
| Variance | 7667.467 | 13844.57 |
| Observations | 6 | 6 |
| Pooled Variance | 10756.02 |   |
| Hypothesized Mean Difference | 0 |   |
| df | 10 |   |
| t Stat | -0.08629 |   |
| P(T<=t) one-tail | 0.466471 |   |
| t Critical one-tail | 1.812461 |   |
| P(T<=t) two-tail | 0.932942 |   |
| t Critical two-tail | 2.228139 |   |
| Pro- Coalition New York |
|  | *Before* | *After* |
| Mean | 17.66667 | 28.16667 |
| Variance | 94.66667 | 401.3667 |
| Observations | 6 | 6 |
| Pooled Variance | 248.0167 |   |
| Hypothesized Mean Difference | 0 |   |
| df | 10 |   |
| t Stat | -1.15481 |   |
| P(T<=t) one-tail | 0.137509 |   |
| t Critical one-tail | 1.812461 |   |
| P(T<=t) two-tail | 0.275019 |   |
| t Critical two-tail | 2.228139 |   |

1. While the nature of governance in any country is inherently about managing conflict, in less democratic states this conflict is kept within the ‘black box.’ In addition, policies such as the separation of powers in the US make conflict inevitable. [↑](#footnote-ref-1)
2. Individuals and organizations can have inactive or ‘zombie’ Twitter accounts that are either unattended or not used to post Tweets. Those accounts are excluded from this manuscript. [↑](#footnote-ref-2)
3. In the original ‘snowball’ approach, individuals that worked at the same organization were separated out. Because this study is more interested in the organizational affiliation of policy actors on Twitter, those individuals were aggregated into a singular policy actor. Actors without an organizational affiliation were omitted. [↑](#footnote-ref-3)
4. Chapters of this manuscript focus on the two years before and two years after (or smaller increments therein) the major policy change. This covers the time period 2012 to 2016. While I recognize that policy actors ‘come and go’ from the subsystem, it is a reasonable assumption to make that those identified in the survey during 2017 in New York and 2014 in Colorado would also be present from 2012 to 2016. There activity is not assumed but rather evidenced in their frequency of tweets that included content about unconventional oil and gas. [↑](#footnote-ref-4)
5. While I have tweets from 2009 to 2016, I did not analyze those before 2012, except to provide descriptive statistics for this introduction. [↑](#footnote-ref-5)
6. We reached 35% agreement on the presence of the same issue frame and 98% agreement on the absence of an issue frame. [↑](#footnote-ref-6)
7. 28 frames were constructed by unaffiliated policy actors in New York [↑](#footnote-ref-7)
8. 30 frames were constructed by unaffiliated policy actors in Colorado [↑](#footnote-ref-8)
9. This finding was not statistically significant. See **Appendix B** for the two-sample t test assuming equal variance. [↑](#footnote-ref-9)