

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23

ADVOCACY COALITIONS IN THE TWITTERSPHERE

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

by

DR. DANIEL P. COSTIE

EASTERN OREGON UNIVERSITY

24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56

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 perceived 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.

57

58

Introduction

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

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

81 issue frame congruence between coalitions, and that a sudden increase in the number of frames
82 will precede major policy change.

83 This work finds that the same dominant frames identified in other works are present on
84 Twitter (i.e., Dodge and Lee 2017b; Flachsland, Pahle, and Leipprand 2015; Shaw and Nerlich
85 2015; Yordy et al. 2019). While other discursive strategies are employed via Twitter, issue
86 frames are very common. Between coalitions, I find little issue congruence as the anti-coalition's
87 strategy mostly involves positioning the conversation towards environmental and public health
88 and safety risks while the pro-coalition directs the conversation in the direction of economic and
89 energy development benefits. This suggests a subsystem characterized by competition and not
90 consensus building. The findings also show that science and regulatory frames are
91 complementary frames used in addition to the main stream, dominant issue frames. Lastly, I find
92 evidence of an issue expansion strategy by both coalitions leading up to a major policy change.

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

98

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

100 The ACF is an analytical approach used to help understand how politics inform public
101 policies (and vice versa). Unlike more traditional political science approaches, the framework
102 recognizes the complexity of the policy process by going beyond observations of formal
103 governing institutions (e.g., a single government decision-making venue) and incorporating a

104 more diverse set of actors. Similar to scholarship observing ‘issue networks’ (Hecl 1978) and
105 ‘policy communities’ (Guber and Bosso 1968), the study of advocacy coalitions seeks to broaden
106 the iron triangle and recognize that actors outside of the US Congress, resource-rich interest
107 groups, and the bureaucracy can be relevant and that scholars must endeavor to study the
108 motivations of a broader set of actors, how they coordinate action (within and outside of the iron
109 triangle), what strategies they employ and the spaces they engage to influence policy outcomes
110 (Ingold 2011; Jenkins-Smith, St. Clair, and Woods 1991; Matti and Sandström 2011; Sabatier
111 1988).

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

127 but may also weaponize it for political ends. This is much less common in collaborative and
128 unitary subsystems.

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

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

145 Beliefs are often the ‘glue’ binding coalition members together. Sabatier (1998) organizes
146 these beliefs into a three-tiered model. Deep core beliefs, as the name suggests, refers to beliefs
147 that act as a cognitive foundation; the justification for support or opposition of less abstract ideas

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.

148 such as one's policy positions. These often are conceived as the values and morals that shape our
149 understanding of the real world, our disposition for certain priorities and what is deemed
150 appropriate for government intervention. For example, in shale gas development, those in favor
151 share deep core beliefs related to the importance of resilience while those against share beliefs
152 related to sustainability (Evensen, Stedman, and Brown-Steiner 2017). This has implications for
153 the types of policy positions one would find appropriate and/or realistic.

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

160 **Participation in a Discursive Venue**

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

169 When they express policy preferences, political organizations and individuals make
170 conscious decisions about how and where they see their preferences most favorable to shaping

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

180 Coalition members will choose venues based on favorable rules of engagement or the
181 alignment of an agency's mission with that of a given interest group (Baumgartner and Jones
182 1993; Holyoke, Brown, and Henig 2012). However, some coalition members find themselves
183 shut out of traditional decision-making venues altogether and must find different ways of
184 influencing the policy process. Outside strategies available through discursive venues are utilized
185 instead. While they are often not linked to direct levers of power, discursive venues can
186 indirectly influence the policy agenda by giving attention to a policy solution and/or problem.
187 Coalition members with access to traditional decision-making venues are also present in these
188 venues. One central goal of such strategies is to shape the views of incumbents holding various
189 policy positions (Nohrstedt and Olofsson 2020). The participation of a broader set of coalition
190 members in discursive venues, with and without access to traditional venues, has the potential to
191 shape how the problem is defined or the menu of legitimate policy solutions by those active in
192 decision-making venues.

Political Participation in Online Discursive Venues

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

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

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

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

233

234 **Issue Framing as a Discursive Strategies**

235 Issue framing may be a strategy as old as politics (Yordy et al. 2019). Recognition of
236 framing as an important factor in the study of politics and policy can be traced back to
237 Lippman’s (1922) ‘pictures in our heads’ analogy. This conceptualization is shared in later
238 studies of ‘mental boxes’ or ‘interpretive storylines (Nisbet 2009). Framing provides the dialectic
239 structure through which public policy issues are debated. To frame is to select “...some aspects
240 of a perceived reality and make them more salient in a communication text, in such a way as to

241 promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment
242 recommendation (Entman 1993, 52).” Frames are heuristic and thematic cues used to
243 contextualize a policy issue and orient an audience to information in a deliberate way (Lawlor
244 2016).

245 Frames resonate because of the limited cognitive capacity of all individuals to focus and
246 process all relevant information to make a ‘completely’ informed decision (Haider-Markel and
247 Joslyn 2001). As ‘cognitive misers,’ humans use heuristics to organize and prioritize certain
248 stimuli while ignoring others. If we did not do this, we would be paralyzed from the inundation
249 of information our brain is exposed to at virtually all times (Guber and Bosso 1968; Nelson,
250 Clawson, and Oxley 1997). This ‘short cut’ is the reason why decision making in response to
251 frames is better explained by prospect theory than the expected utility model. The utility model
252 assumes that an individual has complete or close to complete knowledge to make an optimal
253 decision. However, most political decisions are complex and made amidst a shroud of
254 uncertainty, both in terms of predicting consequences but also in terms of how to measure
255 success and failure. As such, decision-making must consider how an individual decides in
256 situations involving risk, or in the absence of all necessary information. This explains why
257 framing is so powerful. Tversky and Kahneman (1981) use the analogy of one’s vantage point to
258 argue “The susceptibility to perspective effects is of special concern in the domain of decision-
259 making because of the absence of objective standards such as the true height of mountains”
260 (457).

261 Coalitions strategically use frames for two main reasons. The first is to persuade others of
262 a given argument as to change public opinion (Jacoby 2000). How one frames the issue
263 influences how it resonates. Kinder and Sanders (1990)’s study of affirmative action finds that

264 alterations in how the debate unfolded during deliberation influenced changes in opinion. A
265 change of a single word can influence such a shift. Smith (1987) finds the public to be more
266 receptive to the term ‘poor’ than the term ‘welfare.’ Variations in the level of abstraction can also
267 impact the persuasiveness of frames. Jacoby (2000) finds that when deliberating over
268 government spending, more specific frames were associated with public support while general
269 frames were not. What this makes clear is that the effective use of issue frames is predicated on
270 choosing language that is not overly broad and must recognize the meaning of words that may be
271 highly contextual and emotionally charged.

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

282 **Competition Over Dominant Issue Frames**

283 The meaning of a political symbol or event is not objective (Pralle 2009). Issue frames
284 refer to discursive political symbols that act as central organizing ideas that provide meaning to a
285 set of events (Gamson and Modigliani 1989). Politics, instead, can be thought of as a contest
286 between different frames regarding the right to interpret an issue or a problem in a certain way

287 (Snow and Benford 1988). Policy actors can thus be conceived as ‘combatants in the policy
288 arena,’ using issue frames to compete for attention and legitimacy in a discursive venue
289 (Callaghan and Schnell 2001). This reflects Lindblom’s (1965) understanding of politics as a
290 constant struggle among organized interests, political elites, and citizens to get their priorities on
291 the public agenda while keeping others’ off.

292 A dominant frame is determined by three factors: cultural resonance, sponsor activities,
293 and media practices. Cultural resonance refers to the natural advantage of certain symbols due to
294 its alignment or embeddedness in larger cultural themes. Its resonance is also related to an
295 alignment of the frame with deep core and policy core beliefs. Understanding a policy actor’s
296 policy core beliefs and secondary beliefs are strongly related to how effective issue frames are
297 constructed (Kinder and Sanders 1990). Understanding beliefs helps us select appropriate frames
298 to use or at least which frames will not be persuasive to a target population.

299 Sponsor activities, or the author of a message with a frame, relates to advocacy and the
300 utilization of political strategies, such as posting on an SNS, by those perceived to be credible
301 and legitimate within the subsystem. A well-known and perhaps institutionalized coalition
302 member is more likely to be persuasive, and thus successful at championing dominant frames,
303 than a lesser-known policy actor. Thus, the dominant coalition members will have a
304 disproportionate amount of influence on which frames are elevated.

305 Lastly, media practices influence which frames dominate (Gamson and Modigliani 1989).
306 Journalistic norms and practices that govern news media as well as journalists’ conscious and
307 unconscious biases shape how and how frequently a given issue is framed. Through a journalistic
308 lens, certain frames get amplified while others are stifled. Frames that invoke sentiments of
309 conflict, for instance, are more prolific than less sensational frames in news coverage of politics

310 in the United States (Putnam and Shoemaker 2007). Media practices are also important to
311 understand because the official frames used by public institutions often get the benefit of the
312 doubt. The media has often been a curator of issue frames and thus has had a significant impact
313 over which frames dominate. However, it is unclear if similar trends will be used on social media
314 as policy actors have direct control over how they present themselves and curate their message.

315 **Twitter to Complement ACF Methods**

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

331 Surveys are some of the most common data sources because of the strengths described
332 above. However, Sabatier and Jenkins-Smith (1993) identify several weaknesses that future

333 researchers should heed. First, they are rarely longitudinal. Second, it is difficult to decide who
334 should be surveyed to get an accurate account that can be generalized to the entire population of
335 interest. Third, surveys offer less flexibility as they tend to be highly standardized, making it
336 hard to adapt and change the research design once the study has begun. Fourth, surveys are
337 vulnerable to reactivity as respondents' answers can change based on the presence of the
338 researcher (or other environmental conditions). Lastly, surveys tend to rely on reports of
339 behavior rather than observations of behavior (Singleton Jr. and Straits 2010).

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

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

351 Policy subsystems tend to be stable through a combination of entrenched institutional
352 forces (such as rules and norms) and countervailing political pressures from rival coalitions.
353 When there is more than one coalition, they can act as counterweights to each other, working to
354 leverage political influence to shape analytical debates but seldom experiencing major shifts in
355 gaining or losing political ground. Actors within coalitions coordinate their actions towards a

356 common goal, usually aimed at some sort of change in policy or protection of the status quo.
357 However, some salient events have the ability to destabilize the subsystem (and coalitions and
358 policies therein) by causing dramatic shifts in priorities, attention, and resources (Birkland 1998;
359 Light 1982). One of the more comprehensive understandings of the impact of salient events on
360 politics and policy comes from the literature on focusing events which can shift attention,
361 highlight problems within a policy subsystem and bring in novel information. These dynamics
362 can ultimately lead to major policy change (Birkland 2006). The ACF views focusing events as a
363 potential catalyst for major policy change but further distinguishes when the impetus is
364 exogenous or internal. Major socio-economic shifts, regime changes and spillover from other
365 subsystems are considered external triggers while internal shocks are indicative of policy failures
366 pursued by a dominant coalition. This provides the minority coalition with an incentive to
367 capitalize on a window of opportunity and expand the issue (Weible and Sabatier 2005).

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

379 the form of governance, the power of groups, and the definition of policy problems (Mettler and
380 SoRelle 2014).

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

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

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

399 Hydraulic fracturing, often associated with horizontal drilling, refers to a completion
400 technique that injects high pressure liquid into a rock formation until it fractures (Cook et al
401 2018). The amount of water used varies depending on the rock formation. The amount can range

402 from 1.5 million gallons per well in the Bakken formation to 5.7 million gallons per well used in
403 the Haynesville formation (Nicot and Scanlon 2012). This process causes oil and gas deposits to
404 be released from the shale play. Due to technological innovation, these formerly off limit shales
405 have become accessible and economical (Finkel and Hays 2013).

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

418 Supporters of hydraulic fracturing point to several benefits to the practice. First, the
419 exploration, construction, and extraction of oil and gas is a job creator for local economies,
420 especially in rural areas who have been economically depressed for decades. This can also be a
421 boon for local governments in desperate need of tax revenue (Kay 2011). In addition, it can be an
422 additional income source for landowners (Clarke et al. 2015). Lastly, there are macro-benefits
423 that are often celebrated. The role of increased oil and gas production keeps the United States
424 less dependent on foreign sources and can reduce the energy costs of the individual consumer

425 (USEIA 2014). The ‘clean’ natural gas is also used to argue that the practice creates a more
426 environmentally friendly alternative to coal (Moskowitz 2015).

427 While advocates of oil and gas discuss the economic advantages of unconventional oil
428 and gas development, there are distinct challenges that are raised by opponents. Environmental
429 concerns are not only due to the amount of water used but also the impacts of unconventional oil
430 and gas development on land use, animal welfare, air quality, water contamination, and its link to
431 seismic activity (Davis 2012; Ellsworth 2013; Urbina 2011; Bamberger & Oswald 2015). Konkel
432 (2016)’s study of drinking water on indigenous lands found that the practice created 1 million
433 gallons of wastewater, it went into the soil, and killed vegetation. Air quality analyses are often
434 related to methane emissions, despite proponents of hydraulic fracturing messaging natural gas
435 as a ‘clean’ alternative (Moskowitz 2015). Several scholars have found that the injection of fluid
436 can increase pressures within the pores of deep rock formations which, in turn, can generate
437 earthquakes (Hand 2015; Gallegos et al. 2016).

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

446 Partially due to disagreement about the severity and promise of the aforementioned risks
447 and benefits, conflict is viewed as a central component to both conventional and unconventional

448 oil and gas subsystems (Weible et al. 2016). It has been observed across the state and across the
449 country (Becker and Werner 2014; Chailleux and Moyson 2016; Rabe 2013). Disagreement
450 stems from dispute over whether a problem exists, how that problem should be solved, and who
451 exactly should solve it. Conflict related to unconventional oil and gas development could be a
452 battle of which level of government has authority. In Colorado, for instance, it can be found
453 around competing claims of state and local regulatory rights (Heikkila, Weible, and Olofsson
454 2017; Rabe 2013). Whereas in New York, the debate was more focused on how the state should
455 govern, not if they should govern. Both cases, however, demonstrate a significant degree of
456 conflict, and are adversarial in nature.

457 Within these conflict-prone subsystems, there is variation in the amount of resources and
458 political influence each coalition wields. Colorado is one of twenty-seven US states with shale
459 oil deposits. In 2009, Colorado ranked sixth in natural gas production. How to regulate
460 unconventional oil and gas development in Colorado has been a contentious political issue
461 (Davis 2012). Public debates about unconventional oil and gas development have often pitted
462 environmental groups, community organizations and local government agencies concerned about
463 pollution and public health against state governments and extractive industries looking to
464 increase tax revenue and profits (Heikkila, Pierce, et al. 2014). The Colorado Oil and Gas
465 Conservation Commission (COGCC) was created in 1951 and was charged with representing the
466 interests of Colorado oil and gas to business and other interests outside the state (Ray & Hutchins
467 2017). Their role courting industry was expanded to include regulation to protect health and the
468 environment (Heikkila, Weible, and Pierce 2014). These countervailing missions have caused
469 many to question which will get prioritized when they come at odds. For the past decade, former
470 Governor and oil and gas geologist John Hickenlooper has been perceived by many to be a

471 proponent for the oil and gas industry, along with a series of Republican and Democratic
472 legislatures that oversaw a dramatic increase in unconventional oil and gas (Woodruff 2019).

473 Perhaps the most significant state policy that anti-unconventional oil and gas policy
474 actors could qualify as a victory came with the adoption by the COGCC in 2011 of a rule
475 requiring the disclosure of chemicals used in the unconventional oil and gas development
476 process. Activists celebrated this as a step in the right direction. However, they still had to
477 compromise by allowing companies to protect some proprietary information (Proctor 2011). The
478 anti-unconventional oil and gas crowd has experienced a series of setbacks in recent years. In
479 2016, the Colorado Supreme Court struck down several municipal and county unconventional oil
480 and gas bans, arguing that it is the state's right to regulate the industry, superseding any mandate
481 by local governments (Turkewitz 2018).

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

489 The promise of extraction would prove to be short lived. Governor Paterson imposed a
490 moratorium on unconventional oil and gas development in 2008. After 2008, at least 331 policies
491 and resolutions were passed related to unconventional oil and gas development at the local level
492 and at least 200 anti-unconventional oil and gas development groups were formed (Arnold and
493 Long 2017). In December of 2014, that was followed up with a total ban on unconventional oil

494 and gas development in New York, making the state only one of two to have banned it (Sabatier
495 and Weible 2016). Unconventional oil and gas development had been one of the most divisive
496 issues in New York politics in years. While conflict may be high, it is clear that institutional
497 support and mobilization of anti-unconventional oil and gas interests are behind the most
498 significant policy change around unconventional oil and gas in United States history.

499

500 **Research Questions and Hypotheses**

501 The overall research question of this chapter is ‘how are issue frames used by coalitions
502 in the unconventional oil and gas subsystem and how do they change over time?’ This
503 manuscript looks at variance in messaging. While there are other discursive strategies that
504 coalition members can utilize, the persuasive power of dominant frames will make them hold a
505 prominent place in the discursive venue. In similar energy and environmental subsystems, issue
506 frames have been identified in analyses of debates and newspaper coverage (Dodge and Lee
507 2017b; Flachslan, Pahle, and Leipprand 2015; Shaw and Nerlich 2015; Yordy et al. 2019). They
508 relate to economics, public health and safety, energy independence, the environment, and use of
509 science. This chapter tests to assess the degree to which those issue frames are used on Twitter.
510 The first hypothesis is:

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

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

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

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

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

526 **Methods**

527 **Source**

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

537 **Case Selection**

538 The unconventional oil and gas subsystems of New York and Colorado, United States
539 will be the focus of this study. Following Seawright and Gerring (2008)’s Purposive Case
540 Selection method, I am interested in structuring a case study comparison of an extreme with a

541 'normal' case. The extreme characteristic related to my research question is a major policy
542 change. In New York, there has been an outright ban while other subsystems have experienced
543 only minor policy changes. In line with the aforementioned scholars, such an approach is
544 exploratory in nature; to understand how an extreme treatment impacts key variables.

545 **Data Collection**

546 Data collection occurred in three steps. The first step involved the identification of policy
547 actors in the subsystem. I identified policy actors a priori using the results of two sampling
548 processes conducted by the Workshop on Policy Process Research (WOPPR) at the University of
549 Colorado Denver. WOPPR is a research lab focused on using diverse theoretical lenses and
550 methodological approaches to understand how public policy is designed and implemented. The
551 purpose of this particular project was to capture and analyze actors who were actively involved
552 or knowledgeable about unconventional oil and gas development in New York and Colorado.
553 The survey in New York was conducted in 2017. In Colorado, the survey was conducted in
554 2014. Through a purposive sampling approach based on evidence in media reports, online
555 reports, public hearings, testimony and recommendations from interviews, WOPPR scholars
556 identified 930 individuals and organizations working to shape policy around unconventional oil
557 and gas development in those respective states (Heikkila and Weible 2015, 2017; J. Pierce 2013).
558 In New York, 379 policy actors were identified. In Colorado, 551 policy actors were identified.
559 During the second phase, I cross referenced the 930 individuals and organizations to identify
560 which of those policy actors had active Twitter accounts.² Of the 930 total policy actors within

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 dissertation.

561 the two subsystems, 335 accounts were identified.³ The last step utilized programming software
562 to ‘call up’ tweets from Twitter’s Application Programming Interface based on a set of
563 parameters. The 335 Twitter handles were then paired with keywords “hydraulic fracturing,”
564 “unconventional oil and gas development,” “unconventional oil and gas,” “shale gas,” “shale
565 oil,” “unconventional oil,” “unconventional gas,” and “stimulation.” The queries originally
566 collected all tweets with the aforementioned keywords made by the identified Twitter accounts
567 from 2009 to 2016.^{4 5}

568 **Data Measurement**

569 Coalition membership was measured by identifying a policy position in the content of an
570 original post during within two years of the major policy change or by evaluating their mission
571 statement on their website as of August of 2019. It is assumed that policy core beliefs such as
572 support or opposition to unconventional oil and gas are relatively stable. Because of this, one
573 instance of a policy position was sufficient to determine coalition membership. Policy actors
574 were coded as pro-, anti-, or unaffiliated based on their policy position related to unconventional
575 oil and gas development, also referred to as hydraulic fracturing or ‘fracking.’ A “pro- coalition”
576 member would be coded if the actor expresses in a tweet that they were supportive of
577 unconventional oil and gas development. A supportive tweet can come in the form of stating that
578 the actor wants to see unconventional oil and gas continued or expanded. It could also be through

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.

⁴ Chapters of this dissertation 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. Their activity is not assumed but rather evidenced in their frequency of tweets that included content about unconventional oil and gas.

⁵ While I have tweets from 2009 to 2016, I did not analyze those before 2012, except to provide descriptive statistics for this introduction.

579 their professed actions. Supportive actions can be identified if the policy actors talk about
580 engaging in drilling or unconventional oil and gas wells, investing in unconventional oil and gas
581 businesses, collaborating with the oil and gas industry on researching unconventional oil and gas
582 technologies, exploring a shale formation, or taking political actions that represent support (e.g.
583 testifying in a public hearing that unconventional oil and gas is beneficial, safe, or “good” in
584 some way), etc.

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

593 **Data Analysis**

594 I focused the analysis on the six weeks leading up to the major policy change (November
595 1st, 2014 to December 16th, 2014) and the six weeks that followed (December 17th, 2014 to
596 January 31st, 2015). The ban on unconventional oil and gas development constitutes a major
597 policy change. Two thousand tweets were coded before the major policy change and 2,416 were
598 coded after, for a sample of 4,416 tweets. Intercoder reliability was conducted over three rounds
599 with two coders to ensure internal validity. Each round of intercoder reliability checks increased

600 the percentage of agreement on whether an issue frame existed in a tweet and which issue frame
601 is being used.⁶

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

613 Results

614 Before presenting results related to the online Discursive Strategy Hypothesis, a brief
615 overview of the other types of political messaging present in the data is helpful. Issue framing is
616 not the only way in which political messages are communicated via Twitter. There are political
617 tweets that highlighted decision-makers who were for or against unconventional oil and gas and
618 public opinion polls ('New poll shows x% of New Yorkers approve of y'). Also, many tweets are
619 words of encouragement, thanking decision-makers and other policy actors for their work in the
620 policy process ('Thank you, Governor Cuomo'). Some tweets provide updates on some technical
621 or tangential aspect of unconventional oil and gas ('Shale gas pipeline moving from x to y').

⁶ We reached 35% agreement on the presence of the same issue frame and 98% agreement on the absence of an issue frame.

622 Others are statements of policy positions without an issue frame attached ('Go Frack Go!'). Still
623 others are calls to action ('Please sign this petition to ensure that x happens'). Lastly, science is
624 invoked but is done as a way to discredit the source or to indicate the inconclusiveness of
625 scientific inquiry.

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

645 'science in support' argues that a study found that unconventional oil and gas chemicals are safe
 646 relative to other common household items. This constitutes both a science and public health and
 647 safety frame.

648 **Table 1: Dominant Frames in Use**

Dominant Frames In Use						
	Economics	Environment	Energy Development	Public Health	Policy	Science
Anti	(Risk) #Fracking industry rep: "I get up every morning & I try to figure out how to screw with the labor unions,,,"	(Risk) Montana Const => people have right to #healthy #environment !! #justsayno #fracking	(Risk) MYTH BUSTING! #Fracking will not offer energy security. #Shalegas wells produce 80-95% of their gas in first 3 years.	(Risk) While some Texans win in shale boom, residents living with #fracking lose @KPRCLocal2	(Risk) New #methane regulations half measure that won't stop #fracking or solve climate crisis; (Benefit) i.#FingerLakes businesses, wineries, etc. applaud @NYGovCuomo for #NY's #fracking ban & protecting public health	(In Opposition) i.#Frack lung? New Yale study finds respiratory illnesses reported twice as often among people who live near drilling.
Pro	(Benefit) Struggling dairy farmers see fortunes change as #shale gas rights bring in big bucks.	(Benefit) Gerard: US emissions reduction is thanks to America's energy renaissance, driven by clean burning natural gas. #whatsnextenergy #fracking	(Benefit) Thanks to American oil unlocked by #fracking, here's what oil imports to the U.S. Gulf Coast look like since 2009	(Benefit) "For #Colorado families, this should again give comfort that oil & gas development is being conducted responsibly"	(Risk) New York #Fracking Ban Is Killing Local Farms And Businesses: http://t.co/pm9EklXkpX	(In Support) Study: #Fracking chemicals found in toothpaste and ice cream.

649

650

651

652

653

654

655

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

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

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

⁷ 28 frames were constructed by unaffiliated policy actors in New York

⁸ 30 frames were constructed by unaffiliated policy actors in Colorado

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

679 *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

680

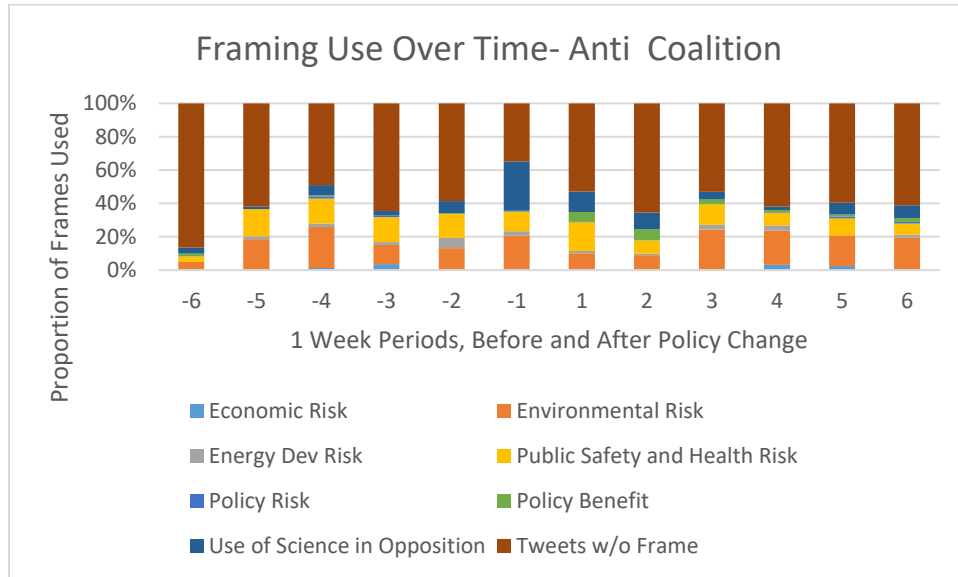
681 *Colorado*

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

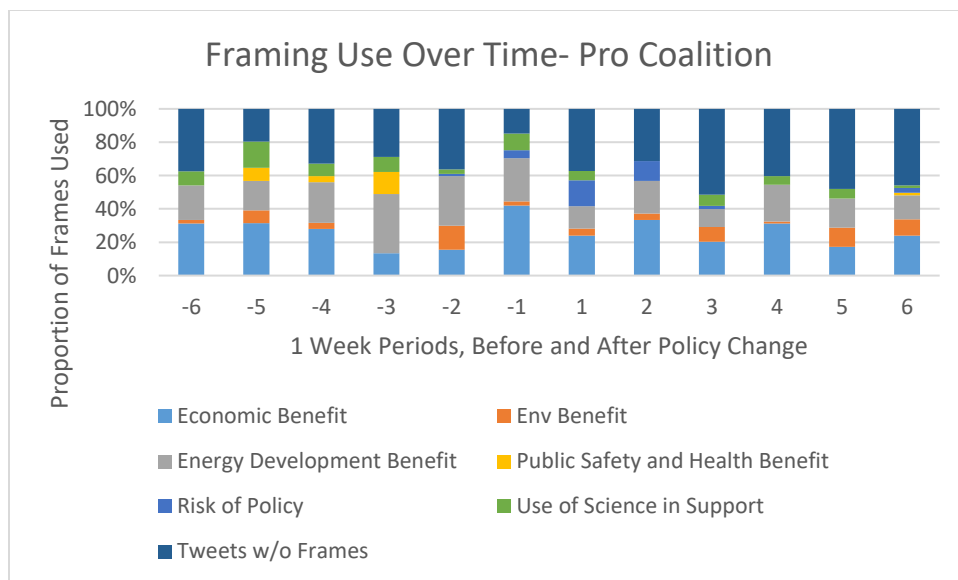
682

683

684 **3.1 Issue Framing Over Time in New York**



685



686

687

688

689

690 To test the temporal aspect of this work, this chapter analyzes the frames used in 1-week
691 increments. The Issue Frame Stability Hypothesis expects that issue expansion will occur in both
692 coalitions leading up to a major policy change. **Graphic 3.1** show the changes in total tweets
693 over time by week. Periods ‘-6’ to ‘-1’ represent the six weeks leading up to the policy change
694 on December 16th, 2014. Periods ‘1’ to ‘6’ represents the six weeks after the policy change. The
695 graphic illustrates that there is indeed an increase in issue framing leading up to the policy
696 change in New York. This also shows that leading up to the policy change, both coalitions
697 utilized issue framing more than they had in the five periods leading up to the change, followed
698 by a marked decrease in issue framing. This reduction is more pronounced with the anti-coalition
699 than the pro-coalition. Leading up to the policy change, anti-coalition’s use of policy benefits
700 exhibited the greatest increase in frequency. For the pro-coalition, the greatest increase leading
701 up to the policy change is seen in economic benefit frames⁹.

702 Discussion

703 This chapter asks, ‘how are issue frames used by advocacy coalitions and how does this
704 change over time?’ Partially confirming the first hypothesis, I find that dominant issue frames
705 are a strategy employed by both coalitions. The frames that have been found in debates and
706 newspapers are very salient on Twitter. This reinforces Guggenheim et al. (2015)’s claim that
707 there is a feedback loop between traditional media sources and Twitter. I also find that outside
708 events are used to construct issue frames. This is further evidence that the physical boundaries
709 that separate subsystems are at least porous enough for homogenous political messaging to reach
710 audiences in different cities and has the potential to influence the policy processes in distant
711 locations. A final observation of how coalition members in the unconventional oil and gas

⁹ This finding was not statistically significant. See **Appendix B** for the two-sample t test assuming equal variance.

712 subsystem use issue frames is that they are often used in conjunction with other issue frames.
713 The platform limits communication to 240 characters. As a result, typical messages are not
714 terribly nuanced, and it often takes users several tweets to convey a complex message. Because
715 of this, it is surprising to see relatively complex issue frame construction in a single tweet.

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

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

731 Lastly, the Issue Framing Stability Hypothesis was confirmed. There was an increase in
732 framing leading up to the major policy change. This provides some evidence that there were
733 strategic efforts to mobilize coalition members leading up to the ban. What had lagged, however,
734 was discussion of *benefits* or *risks of policy* frames used by the respective coalitions. This

735 suggests coalition members are shifting not only the frequency of issue frames but also the
736 selection of issue frames in response to the policy change.

737 **CONCLUSION**

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

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

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

772 A second limitation is the extent to which social media reflects meaningful association
773 and coordination. Information transfer amongst policy actors may be overstated. One entrenched
774 weakness of the ACF is its inability to draw the line between what is meaningful coordination
775 and what is not. More explicit and visible displays of collective action are easily identified but
776 there are many other behaviors of successful coalitions that are not as easy to measure. Many
777 studies have confirmed that online discourse does reflect off-line behavior related to voting,
778 protesting, and even revolution (O'Conner et al 2010; Costanza-Chock 2008). As more and more
779 people shift their civic engagement to online platforms, especially during the lead up to a

780 presidential election in a pandemic, the more likely that those associations will manifest into real
781 changes to the policy agenda vis-à-vis alignment of a coalition's discursive strategies and shifts
782 in public opinion.

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

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

799 Theoretically, this work contributes in two key ways. First, it provides additional insight
800 into how the ACF should conceptualize a policy subsystem. While all politics may be local,
801 those politics can be strategically used across subsystems, blurring the boundaries between them.
802 National players such as the American Petroleum Institute and Earthworks have influence in

803 discursive venues even if they are not ones with local knowledge or ‘boots on the ground.’
804 Discursive venues like Twitter allow for events in different geographic locations relevant to
805 policy actors in the New York subsystem to be distributed through the coalition’s network. As
806 the use of the internet increases, the physical boundaries separating subsystems may need to be
807 rethought or perhaps rejected entirely.

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

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

823

824

825

826

827

828

829

830

831

832

833

834

835

836

837

838

839

840

841

REFERENCES

- 842
843 Abokhodair, Norah, Daisy Yoo, and David W. McDonald. 2015. "Dissecting a Social Botnet:
844 Growth, Content and Influence in Twitter." *CSCW 2015 - Proceedings of the 2015 ACM*
845 *International Conference on Computer-Supported Cooperative Work and Social*
846 *Computing*: 839–51.
- 847 Adgate, John L., Bernard D. Goldstein, and Lisa M. McKenzie. 2014. "Potential Public Health
848 Hazards, Exposures and Health Effects from Unconventional Natural Gas Development."
849 *Environmental Science and Technology* 48(15): 8307–20.
- 850 Administration, U.s. Energy Information. 2013. "Technically Recoverable Shale Oil and Shale
851 Gas Resources : An Assessment of 137 Shale Formations in 41 Countries Outside the
852 United States." *U.S. Energy Information Administration* 2013(June): 76 pp.
- 853 Agarwal, Sheetal D., W. Lance Bennett, Courtney N. Johnson, and Shawn Walker. 2014. "A
854 Model of Crowd-Enabled Organization: Theory and Methods for Understanding the Role of
855 Twitter in the Occupy Protests." *International Journal of Communication* 8(1): 646–72.
- 856 Agranoff, Robert, and Michael McGuire. 2001. "Big Questions in Public Network Management
857 Research." *Journal of Public Administration Research and Theory* 11(3): 295–326.
858 <http://jpart.oxfordjournals.org/content/11/3/295.abstract>.
- 859 Arnold, Gwen, and Le Anh-Nguyen Long. 2017. "Analyzing the Role of Social Networks in
860 Municipal Decision-Making about High-Volume Hydraulic Fracturing." *Policy Studies*
861 *Journal* 45(3): 414–41.
- 862 Arnold, Gwen, and Kaubin Wosti Neupane. 2017. "Determinants of Pro-Fracking Measure
863 Adoption by New York Southern Tier Municipalities." *Review of Policy Research* 34(2):
864 208–32.
- 865 Barberá, Pablo et al. 2015. "Tweeting From Left to Right: Is Online Political Communication
866 More Than an Echo Chamber?" *Psychological Science* 26(10): 1531–42.
867 <https://doi.org/10.1177/0956797615594620>.
- 868 Baumgartner, Frank R. 1989. *Conflict and Rhetoric in French Policymaking*. Pittsburgh:
869 University of Pittsburgh Press.
- 870 Baumgartner, Frank R., and Bryan D. Jones. 1993. *Agendas and Instability in American Politics*.
- 871 Becker, Vanessa, and Anne Werner. 2014. "One Step Forward , One Step Back : Shale Gas in
872 Denmark and Sweden." *Journal of European Management and Public Affairs Studies* 1(2).
- 873 Bennett, W. Lance. 2012. "The Personalization of Politics: Political Identity, Social Media, and
874 Changing Patterns of Participation." *Annals of the American Academy of Political and*
875 *Social Science* 644(1): 20–39.
- 876 Birkland, Thomas A. 1998. "Focusing Events, Mobilization, and Agenda Setting." *Journal of*
877 *Public Policy* 18(1): 53–74.
- 878 ———. 2006. *Lessons of Disaster: Policy Change after Catastrophic Events*. Washington, DC:
879 Georgetown University Press.
- 880 Bishop, Jonathan. 2014. "Representations of 'trolls' in Mass Media Communication: A Review
881 of Media-Texts and Moral Panics Relating to 'Internet Trolling.'" *International Journal of*
882 *Web Based Communities* 10(1): 7–24.

- 883 Bode, Leticia, Emily K. Vraga, Porismita Borah, and Dhavan V. Shah. 2014. "A New Space for
884 Political Behavior: Political Social Networking and Its Democratic Consequences." *Journal*
885 *of Computer-Mediated Communication* 19(3): 414–29.
- 886 Boin, Arjen, Paul 'T Hart, and Allan McConnell. 2009. "Crisis Exploitation: Political and Policy
887 Impacts of Framing Contests." *Journal of European Public Policy* 16(1): 81–106.
- 888 Borgatti, Stephen P. 2005. "Centrality and Network Flow." *Social Networks* 27(1): 55–71.
- 889 Brady, Authors Henry E, Sidney Verba, and Kay Lehman Schlozman. 1995. "Beyond SES : A
890 Resource Model of Political Participation."
- 891 Callaghan, Karen, and Frauke Schnell. 2001. "Assessing the Democratic Debate: How the News
892 Media Frame Elite Policy Discourse." *Political Communication* 18(2): 183–213.
- 893 Chailleux, Sebastien, and Stephane Moyson. 2016. *The French Ban on Hydraulic Fracturing*
894 *and the Attempts to Reverse It : Social Mobilization , Professional Forums , and Coalition*
895 *Strategies.*
- 896 Clarke, Christopher E. et al. 2015. "Public Opinion on Energy Development: The Interplay of
897 Issue Framing, Top-of-Mind Associations, and Political Ideology." *Energy Policy* 81: 131–
898 40. <http://dx.doi.org/10.1016/j.enpol.2015.02.019>.
- 899 Costanza-Chock, Sasha. 2008. "The Immigrant Rights Movement on the Net: Between 'Web
900 2.0' and Comunicación Popular." *American Quarterly* 60(3): 851–64.
- 901 Costie, Daniel P., Federico Holm, and Ramiro Berardo. 2018. "Hydraulic Fracturing, Coalition
902 Activity and Shock: Assessing the Potential for Coalition-Based Collective Action in
903 Argentina's Vaca Muerta Formation." *Extractive Industries and Society* 5(4): 499–507.
904 <https://doi.org/10.1016/j.exis.2018.08.003>.
- 905 Crow, Deserai Anderson, and Michael D. Jones. "Practical Insights from the Study of Narrative
906 Public Policy: A Policy Actor's Guide to the Narrative Policy Framework (Draft)." : 1–23.
- 907 Davis, Charles. 2012. "The Politics of 'Fracking': Regulating Natural Gas Drilling Practices in
908 Colorado and Texas." *Review of Policy Research* 29(2): 177–91.
- 909 Dodge, Jennifer, and Jeongyoon Lee. 2017a. "Framing Dynamics and Political Gridlock: The
910 Curious Case of Hydraulic Fracturing in New York." *Journal of Environmental Policy and*
911 *Planning* 19(1): 14–34.
- 912 ———. 2017b. "Framing Dynamics and Political Gridlock: The Curious Case of Hydraulic
913 Fracturing in New York." *Journal of Environmental Policy and Planning* 19(1): 14–34.
- 914 Downs, Anthony. 1972. "Up and Down with Ecology-the Issue-Attention Cycle." *Public Interest*
915 28.
- 916 Dunning, Thad. 2008. "Improving Causal Inference: Strengths And." *Political Research*
917 *Quarterly* 61(2).
- 918 Easton, David. 1965. *59 A Framework for Political Analysis*. The University of Chicago Press.
- 919 Ellsworth, William L. 2013. "Injection-Induced Earthquakes." *Science* 341(6142): 1225942.
920 [http://science.sciencemag.org/content/341/6142/1225942%0Ahttp://science.sciencemag.org](http://science.sciencemag.org/content/341/6142/1225942%0Ahttp://science.sciencemag.org/content/sci/341/6142/1225942.full.pdf%0Ahttp://www.ncbi.nlm.nih.gov/pubmed/2384690)
921 [/content/sci/341/6142/1225942.full.pdf%0Ahttp://www.ncbi.nlm.nih.gov/pubmed/2384690](http://science.sciencemag.org/content/sci/341/6142/1225942.full.pdf%0Ahttp://www.ncbi.nlm.nih.gov/pubmed/2384690)
922 3.

- 923 Entman, Robert M. 1993. "Framing : Toward Clarification of A Fractured Paradigm." *Journal of*
924 *Communication* 43(January): 51–58.
- 925 Esch, M. 2012. "Gas Drillers Wrangle over New York Limitations, Bans." *Akron Beacon*
926 *Journal*. [http://www.uticaod.com/x1798483124/Many-NY-gas-leases-expire-as-](http://www.uticaod.com/x1798483124/Many-NY-gas-leases-expire-as-moratorium-remains)
927 [moratorium-remains](http://www.uticaod.com/x1798483124/Many-NY-gas-leases-expire-as-moratorium-remains).
- 928 Evensen, Darrick, Richard Stedman, and Benjamin Brown-Steiner. 2017. "Resilient but Not
929 Sustainable? Public Perceptions of Shale Gas Development via Hydraulic Fracturing."
930 *Ecology and Society* 22(1).
- 931 Ferrara, Emilio et al. 2016. "The Rise of Social Bots." *Communications of the ACM* 59(7): 96–
932 104.
- 933 Finkel, M.L. L, and J. Hays. 2013. "The Implications of Unconventional Drilling for Natural
934 Gas: A Global Public Health Concern." *Public Health* 127(10): 889–93.
935 <http://linkinghub.elsevier.com/retrieve/pii/S0033350613002412>.
- 936 Fischer, Manuel. 2014. "Coalition Structures and Policy Change in a Consensus Democracy."
937 *Policy Studies Journal* 42(3): 344–66.
- 938 Fischer, Manuel, Karin Ingold, Pascal Sciarini, and Frédéric Varone. 2012. "Impacts of Market
939 Liberalization on Regulatory Network: A Longitudinal Analysis of the Swiss
940 Telecommunications Sector." *Policy Studies Journal* 40(3): 435–57.
- 941 Flachsland, Christian, Michael Pahle, and Anna Leipprand. 2015. "Energy Transformation on the
942 Rise : An Analysis of Narratives in German Energy Policy Debates." : 1–24.
- 943 Fung, Archon. 2009. "Democratizing the Policy Process." *The Oxford Handbook of Public*
944 *Policy* (August 2018): 1–18.
- 945 Gallegos, Tanya J, Brian A Varela, Seth S Haines, and Mark A Engle. 2016. "Assessment of a
946 Numerical Model to Reproduce Event-Scale Erosion and Deposition Distributions in a
947 Braided River." *Water Resources Research* (52): 6621–42.
- 948 Gamson, William, and Andre Modigliani. 1989. "Media Discourse and Public Opinion on
949 Nuclear Power : A Constructionist Approach." *American Journal of Sociology* 95(1): 1–37.
950 <http://www.jstor.org/stable/2780405>.
- 951 Garrett, R. Kelly. 2006. "Protest in an Information Society: A Review of Literature on Social
952 Movements and New ICTs." *Information Communication and Society* 9(2): 202–24.
- 953 Granovetter, Mark S. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78(6):
954 1360–80.
- 955 Guber, Deborah Lynn, and Christopher J Bosso. 1968. "Issue Framing, Agenda Setting, and
956 Environmental Discourse." : 1–36.
- 957 Guggenheim, Lauren, S. Mo Jang, Soo Young Bae, and W. Russell Neuman. 2015. "The
958 Dynamics of Issue Frame Competition in Traditional and Social Media." *Annals of the*
959 *American Academy of Political and Social Science* 659(1): 207–24.
960 <http://ann.sagepub.com/cgi/doi/10.1177/0002716215570549>.
- 961 Gulati, Ranjay. 1999. "Network Location and Learning: The Influence of Network Resources
962 and Firm Capabilities on Alliance Formation." *Strategic Management Journal* 20(5): 397–
963 420.

- 964 Haider-Markel, Donald P., and Mark R. Joslyn. 2001. "Gun Policy , Opinion , Tragedy , and
965 Blame Attribution : The Conditional Influence of Issue Frames." 63(2): 520–43.
- 966 Hamdy, Naila, and Ehab H. Gomaa. 2012. "Framing the Egyptian Uprising in Arabic Language
967 Newspapers and Social Media." *Journal of Communication* 62(2): 195–211.
- 968 Harlow, Summer, and Dustin Harp. 2012. "Collective Action on the Web." *Information,
969 Communication & Society* 15(2): 196–216.
970 <http://www.tandfonline.com/doi/abs/10.1080/1369118X.2011.591411>.
- 971 Heaney, Michael T., and Fabio Rojas. 2008. "Coalition Dissolution, Mobilization, and Network
972 Dynamics in the U.S. Antiwar Movement." *Research in Social Movements, Conflicts and
973 Change* 28(08): 39–82.
- 974 Heclo, Hugh. 1978. "Issue Networks and the Executive Establishment." *Public Administration
975 Concept Cases*.
- 976 Heikkila, Tanya, Christopher M. Weible, et al. 2014. "A Summary Report of the Politics of
977 Shale Gas Development and High-Volume Hydraulic Fracturing in New York." (April).
- 978 Heikkila, Tanya, Jonathan J. Pierce, et al. 2014. "Understanding a Period of Policy Change: The
979 Case of Hydraulic Fracturing Disclosure Policy in Colorado." *Review of Policy Research*
980 31(2): 65–87.
- 981 Heikkila, Tanya et al. 2019. "A Comparative View of Advocacy Coalitions: Exploring Shale
982 Development Politics in the United States, Argentina, and China." *Journal of Comparative
983 Policy Analysis: Research and Practice* 21(2): 736–56.
984 <https://doi.org/10.1080/13876988.2017.1405551>.
- 985 Heikkila, Tanya, and Christopher M. Weible. 2015. "A Summary Report of a 2015 Survey of the
986 Politics of Oil and Gas Development Using Hydraulic Fracturing in Colorado Authors." : 1–
987 20.
- 988 ———. 2017. *A Summary Report of a 2017 Survey of the Politics of Oil and Gas Development
989 Using Hydraulic Fracturing in Colorado*. Denver.
- 990 Heikkila, Tanya, Christopher M. Weible, and Kristin Olofsson. 2017. "Policy Conflicts over U.S.
991 Shale Development." *Environment* 59(3): 4–13.
- 992 Heikkila, Tanya, Christopher M. Weible, and Jonathan J. Pierce. 2014. "Exploring the Policy
993 Narratives and Politics of Hydraulic Fracturing in New York." In *The Science of Stories:
994 Applications of the Narrative Policy Framework in Public Policy Analysis*, eds. Michael D.
995 Jones, Elizabeth A. Shanahan, and Mark K. McBeth. New York: Palgrave Macmillan, 185–
996 207.
- 997 Hillman, Amy J., and Michael A. Hitt. 1999. "Corporate Political Strategy Formulation : A
998 Model of Approach , Participation , and Strategy Decisions Author (s) : Amy J . Hillman
999 and Michael A . Hitt Source : The Academy of Management Review , Vol . 24 , No . 4 (Oct
1000 ., 1999) , Pp . 825-842 Publishe." 24(4): 825–42.
- 1001 Holyoke, T. T., H. Brown, and J. R. Henig. 2012. "Shopping in the Political Arena: Strategic
1002 State and Local Venue Selection by Advocates." *State and Local Government Review*
1003 44(1): 9–20.
- 1004 Ingold, Karin. 2011. "Network Structures within Policy Processes: Coalitions, Power, and

- 1005 Brokerage in Swiss Climate Policy.” *Policy Studies Journal* 39(3): 435–59.
- 1006 Ingold, Karin, and Christopher M Weible. 2018. “Why Advocacy Coalitions Matter and Practical
1007 Insights about Them.” : 1–25.
- 1008 Jacoby, William G. 2000. “Issue Framing and Public Opinion on Government Spending.”
1009 *American Journal of Political Science* 44(4): 750.
- 1010 Java, Akshay, Xiaodan Song, Tim Finin, and Belle Tseng. 2007. “Why We Twitter:
1011 Understanding Microblogging Usage and Communities.” *Proceedings of the 9th WebKDD
1012 and 1st SNA-KDD 2007 workshop on Web mining and social network analysis -
1013 WebKDD/SNA-KDD '07*: 56–65.
1014 <http://portal.acm.org/citation.cfm?doid=1348549.1348556>.
- 1015 Jenkins-Smith, Hank C., Gilbert K St. Clair, and Brian Woods. 1991. “Explaining Change in
1016 Policy Subsystems: Analysis of Coalition Stability and Defection over Time.” *Political
1017 Science* 35(4): 851–80.
- 1018 Jenkins-Smith, Hank C., and Paul a. Sabatier. 1994. “Evaluating the Advocacy Coalition
1019 Framework.” *Journal of Public Policy* 14(2): 175–203.
1020 http://www.journals.cambridge.org/abstract_S0143814X00007431.
- 1021 Jones, Bryan D, and Frank R Baumgartner. 2012. “From There to Here: Punctuated Equilibrium
1022 to the General Punctuation Thesis to a Theory of Government Information Processing -
1023 Jones - 2012 - Policy Studies Journal - Wiley Online Library.” *Policy Studies Journal*
1024 40(1): 1–20. <http://onlinelibrary.wiley.com/doi/10.1111/j.1541-0072.2011.00431.x/full>.
- 1025 Jones, Michael D., and Hank C. Jenkins-Smith. 2009. “Trans-Subsystem Dynamics: Policy
1026 Topography, Mass Opinion, and Policy Change.” *Policy Studies Journal* 37(1): 37–58.
- 1027 Kay, David. 2011. “The Economic Impact of Marcellus Shale Gas Drilling What Have We
1028 Learned? What Are the Limitations?”
- 1029 Kinder, Donald R., and Lynn M. Sanders. 1990. “Mimicking Political Debate with Survey
1030 Questions: The Case of White Opinion on Affirmative Action for Blacks.” *Social Cognition*
1031 8(1): 73–103.
- 1032 Kingdon, John W. 2011. *Agendas, Alternatives, and Public Policies*. 2nd ed. Longman.
- 1033 Konkel, Lindsey. 2016. “Salting the Earth: The Environmental Impact of Oil and Gas
1034 Wastewater Spills.” 124(12): 230–35.
- 1035 Leifeld, Philip, and Sebastian Haunss. 2012. “Political Discourse Networks and the Conflict over
1036 Software Patents in Europe.” *European Journal of Political Research* 51(3): 382–409.
- 1037 Light, Paul C. 1982. *The President’s Agenda: Domestic Policy Choice from Kennedy to Carter
1038 (with Notes on Ronald Reagan)*. Baltimore: Johns Hopkins University Press.
- 1039 Loader, Brian D., and Dan Mercea. 2011. “Networking Democracy?” *Information,
1040 Communication & Society* 14(6): 757–69.
1041 <http://www.tandfonline.com/doi/abs/10.1080/1369118X.2011.592648>.
- 1042 Lowi, Theodore. 1972. “Four Systems of Policy , Politics , and Choice.” *Public Administration
1043 Review* 32(4): 298–310.
- 1044 Malinick, Todd E., D. B. Tindall, and Mario Diani. 2013. “Network Centrality and Social
1045 Movement Media Coverage: A Two-Mode Network Analytic Approach.” *Social Networks*

- 1046 35(2): 148–58. <http://dx.doi.org/10.1016/j.socnet.2011.10.005>.
- 1047 Manetti, Giacomo, Marco Bellucci, and Luca Bagnoli. 2017. “Stakeholder Engagement and
1048 Public Information Through Social Media: A Study of Canadian and American Public
1049 Transportation Agencies.” *American Review of Public Administration* 47(8): 991–1009.
- 1050 Matti, Simon, and Annica Sandstrom. 2013. “The Defining Elements of Advocacy Coalitions:
1051 Continuing the Search for Explanations for Coordination and Coalition Structures.” *Review*
1052 *of Policy Research* 30(2): 240–57.
- 1053 Matti, Simon, and Annica Sandström. 2011. “The Rationale Determining Advocacy Coalitions:
1054 Examining Coordination Networks and Corresponding Beliefs.” *Policy Studies Journal*
1055 39(3): 385–410.
- 1056 Merry, Melissa K. 2011. “Interest Group Activism on the Web: The Case of Environmental
1057 Organizations.” *Journal of Information Technology & Politics* 8(1): 110–28.
- 1058 ———. 2014. “Broadcast Versus Interaction: Environmental Groups’ Use of Twitter.” *Journal*
1059 *of Information Technology & Politics* 11(3): 329–44.
1060 <http://www.tandfonline.com/doi/abs/10.1080/19331681.2014.933723>.
- 1061 ———. 2017. “Angels versus Devils: The Portrayal of Characters in the Gun Policy Debate.”
1062 *Policy Studies Journal* 00(00). <http://doi.wiley.com/10.1111/psj.12207>.
- 1063 Mettler, Suzanne, and Mallory SoRelle. 2014. “Policy Feedback Theory.” In *Theories of the*
1064 *Policy Process*,.
- 1065 Mettler, Suzanne, and Joe Soss. 2004. “The Consequences of Public Policy for Democratic
1066 Citizenship: Bridging Policy Studies and Mass Politics.” *Perspectives on Politics* 2(1): 55–
1067 73.
- 1068 Mislove, Alan et al. 2011. “Understanding the Demographics of Twitter Users.” *Artificial*
1069 *Intelligence*: 554–57.
1070 <http://www.aaai.org/ocs/index.php/ICWSM/ICWSM11/paper/viewFile/2816/3234>.
- 1071 Mutz, Diana. C. 2002. “Cross-Cutting Social Networks: Testing Democratic Theory in Practice.”
1072 *American Political Science Review* 96(1): 111–26.
- 1073 Nelson, Thomas E., Rosalee A. Clawson, and Zoe M. Oxley. 1997. “Media Framing of a Civil
1074 Liberties Conflict and Its Effect on Tolerance.” *American Political Science Review* 91(3):
1075 567–83.
- 1076 Nicot, J.-P., and B R Scanlon. 2012. “Water Use for Shale Gas Production in Texas, U.S.” *U.S.*
1077 *Environmental Science and Technology* 46: 3580–86.
- 1078 Nisbet, Matthew. 2009. “Communicating Climate Change: Why Frames Matter for Public
1079 Engagement.” *Environment* 51(2): 12–23.
- 1080 Nohrstedt, Daniel. 2010. “Do Advocacy Coalitions Matter? Crisis and Change in Swedish
1081 Nuclear Energy Policy.” *Journal of Public Administration Research and Theory* 20(2):
1082 309–33.
- 1083 ———. 2011. “Shifting Resources and Venues Producing Policy Change in Contested
1084 Subsystems: A Case Study of Swedish Signals Intelligence Policy.” *Policy Studies Journal*
1085 39(3): 461–84.
- 1086 Nohrstedt, D., & Olofsson, K. (2016). Advocacy coalition politics and strategies on hydraulic

- 1087 fracturing in Sweden. In *Policy debates on hydraulic fracturing* (pp. 147-175). Palgrave
1088 Macmillan, New York.
- 1089 O’connor, Brendan, Ramnath Balasubramanyan, Bryan R Routledge, and Noah A Smith. 2010.
1090 “From Tweets to Polls: Linking Text Sentiment to Public Opinion Time Series.”
1091 <http://www.sca.isr.umich>.
- 1092 Olofsson, Kristin L. et al. 2018. “A Dominant Coalition and Policy Change: An Analysis of
1093 Shale Oil and Gas Politics in India.” *Journal of Environmental Policy and Planning* 20(5):
1094 645–60. <https://www.tandfonline.com/doi/full/10.1080/1523908X.2018.1493984>.
- 1095 Olson, M. (2009). *The Logic of Collective Action: Public Goods and the Theory of Groups*,
1096 *Second Printing with a New Preface and Appendix* (Vol. 124). Harvard University Press.
- 1097 Ortman, Stephan. 2012. “Policy Advocacy in a Competitive Authoritarian Regime: The Growth
1098 of Civil Society and Agenda Setting in Singapore.” *Administration & Society* 44(6): 13–25.
1099 <http://aas.sagepub.com/cgi/doi/10.1177/0095399712460080>.
- 1100 Papacharissi, Zizi. 2004. “Democracy Online: Civility, Politeness, and the Democratic Potential
1101 of Online Political Discussion Groups.” *New Media and Society* 6(2): 259–83.
- 1102 Petticrew, Mark et al. 2005. “Natural Experiments: An Underused Tool for Public Health?”
1103 *Public Health* 119(9): 751–57.
- 1104 Pierce, Jonathan J. 2011. “Coalition Stability and Belief Change: Advocacy Coalitions in U.S.
1105 Foreign Policy and the Creation of Israel, 1922-44.” *Policy Studies Journal* 39(3): 411–34.
- 1106 Pierce, Jonathan, and Post-doctoral Scholar. 2013. *A Summary Report of Perceptions of the
1107 Politics and Regulation of Hydraulic Fracturing in Colorado*.
1108 [http://www.ucdenver.edu/academics/colleges/SPA/BuechnerInstitute/Research/natgasdev/P
1109 ages/Understanding-the-Politics-of-Shale-Gas-Development.aspx](http://www.ucdenver.edu/academics/colleges/SPA/BuechnerInstitute/Research/natgasdev/Pages/Understanding-the-Politics-of-Shale-Gas-Development.aspx).
- 1110 Poole, Keith T, and R Steven Daniels. 1985. “Ideology, Party, and Voting in the U.S. Congress,
1111 1959-1980.” *Political Science* 79(2): 373–99.
- 1112 Pralle, Sarah B. 2003. “Venue Shopping, Political Strategy, and Policy Change: The
1113 Internationalization of Canadian Forest Advocacy.” *Journal of Public Policy* 23(3): 233–60.
1114 ———. 2009. “Agenda-Setting and Climate Change.” *Environmental Politics* 18(5): 781–99.
- 1115 Putnam, Linda, and Martha Shoemaker. 2007. “Changes in Conflict Framing in the News
1116 Coverage of an Environmental Conflict.” *Journal of Dispute Resolution* 2007(1): 10.
- 1117 Rabe, Barry G. 2013. “Lessons from Pennsylvania ’ s Early Move into Fracking.” 30(3): 321–40.
- 1118 Rambukkana, Nathan. 2013. “CFP-Hashtag Publics: The Power and Politics of Networked
1119 Discourse Communities.” (Benovitz 124): 1–3. [http://complexsingularities.net/call-for-
1120 papers-hashtag-publics/](http://complexsingularities.net/call-for-papers-hashtag-publics/).
- 1121 Reisigl, Martin, and Ruth Wodak. 2008. “The Discourse-Historical Approach (DHA).” : 87–121.
- 1122 Ruths, D., and J. Pfeffer. 2014. “Social Media for Large Studies of Behavior.” *Science*
1123 346(6213): 1063–64. <http://www.sciencemag.org/cgi/doi/10.1126/science.346.6213.1063>.
- 1124 Sabatier, Paul a. 1998. “The Advocacy Coalition Framework: Revisions and Relevance for
1125 Europe.” *Journal of European Public Policy* 5(1): 98–130.
- 1126 Sabatier, Paul A. 1987. “Knowledge, Policy-Oriented Learning, and Policy Change.” *Knowledge*

- 1127 8(4): 649–92. <http://journals.sagepub.com/doi/10.1177/0164025987008004005>.
- 1128 ———. 1988. “An Advocacy Coalition Framework of Policy Change and the Role of Policy-
1129 Oriented Learning Therein.” *Framework* 21(2): 129–68.
- 1130 Sabatier, Paul A., and Hank C. Jenkins-Smith. 1993. *Policy Change and Learning : An Advocacy*
1131 *Coalition Approach*. Westview Press.
- 1132 Sabatier, Paul A., and Chris M. Weible. 2016. *Theories of the Policy Process*. Westview Press.
- 1133 Sabatier, Paul a, and Hank C. Jenkins-Smith. 1993. “Policy Change and Learning.”
- 1134 Schattschneider, Elmer Eric, and David Adamany. 1975. *The Semisovereign People: A Realist’s*
1135 *View of Democracy in America*. Hinsdale: Dryden Press.
- 1136 Seawright, Jason, and John Gerring. 2008. “Case Selection Techniques in Case Study Research.”
1137 *Political Research Quarterly* 61(2): 294–308.
- 1138 Shaw, Christopher, and Brigitte Nerlich. 2015. “Metaphor as a Mechanism of Global Climate
1139 Change Governance: A Study of International Policies, 1992-2012.” *Ecological Economics*
1140 109: 34–40. <http://dx.doi.org/10.1016/j.ecolecon.2014.11.001>.
- 1141 Shi, Xiaolin, Belle Tseng, and Lada a Adamic. 2007. “Looking at the Blogosphere Topology
1142 through Different Lenses.” *Electrical Engineering* 1001: 48109. [http://icwsm.org/papers/2--](http://icwsm.org/papers/2--Shi-Tseng-Adamic.pdf)
1143 [Shi-Tseng-Adamic.pdf](http://icwsm.org/papers/2--Shi-Tseng-Adamic.pdf).
- 1144 Singleton Jr., Royce A., and Bruce C. Straits. 2010. *Approaches to Social Research*. 5th ed. New
1145 York: Oxford University Press.
- 1146 Smith, L. Graham. 1984. “Public Participation in Policy Making: The State-of-the-Art in
1147 Canada.” *Geoforum* 15(2): 253–59.
- 1148 Smith, Tom. 1987. “That Which We Call Welfare by Any Other Name Would Smell Sweeter an
1149 Analysis of the Impact of Question Wording on Response Patterns.” 51(1): 75–83.
- 1150 Snow, David A., and Robert D. Benford. 1988. “Ideology, Frame Resonance, and Participant
1151 Mobilization.” *International social movement research* 1(1): 197–217.
- 1152 Snow, David A, E Burke Rochford, Steven K Worden, and Robert D Benford. 1986. “Frame
1153 Alignment Processes , Micromobilization, and Movement Participation.” *American*
1154 *Sociological Review* 51(4): 464–81.
- 1155 Steinert-Threlkeld, Zachary C., Delia Mocanu, Alessandro Vespignani, and James Fowler. 2015.
1156 “Online Social Networks and Offline Protest.” *EPJ Data Science* 4(1): 1–9.
1157 <http://dx.doi.org/10.1140/epjds/s13688-015-0056-y>.
- 1158 Stritch, Andrew. 2015. “The Advocacy Coalition Framework and Nascent Subsystems: Trade
1159 Union Disclosure Policy in Canada.” *Policy Studies Journal* 43(4): 437–55.
- 1160 Urbina, Ian. 2011. “A Tainted Water Well, and Concern There May Be More.” : 4–9.
- 1161 Wang, Qiang, Xi Chen, Awadhesh N. Jha, and Howard Rogers. 2014. “Natural Gas from Shale
1162 Formation - The Evolution, Evidences and Challenges of Shale Gas Revolution in United
1163 States.” *Renewable and Sustainable Energy Reviews* 30: 1–28.
1164 <http://dx.doi.org/10.1016/j.rser.2013.08.065>.
- 1165 Wang, Zhongmin, and Alan Krupnick. 2013. “A Retrospective Review of Shale Gas
1166 Development in the United States: What Led to the Boom?” *Economics of Energy and*

1167 *Environmental Policy* 4(1): 5–17.

1168 Weible, Chris, Tanya Heikkila, Karin Ingold, and Manuel Fischer. 2016. “Contours of Coalition
1169 Politics on Hydraulic Fracturing Within the United States of America.” In *Comparing*
1170 *Coalition Politics: Policy Debates on Hydraulic Fracturing in North America and Western*
1171 *Europe*, Palgrave Macmillan.

1172 Weible, Christopher. 2008. “Expert-Based Information and Policy Subsystems: A Review and
1173 Synthesis.” *The Policy of Studies Journal* 36(4): 615–35.

1174 Weible, Christopher M. 2005a. “Beliefs and Perceived Influence in a Natural Resource Conflict:
1175 An Advocacy Coalition Approach to Policy Networks.” *Political Research Quarterly* 58(3):
1176 461–75.

1177 ———. 2007. “An Advocacy Coalition Framework Approach to Stakeholder Analysis:
1178 Understanding the Political Context of California Marine Protected Area Policy.” *Journal of*
1179 *Public Administration Research and Theory* 17(1): 95–117.

1180 Weible, Christopher M., and Paul A. Sabatier. 2005. “Comparing Policy Networks: Marine
1181 Protected Areas in California.” *Policy Studies Journal* 33(2): 181–201.

1182 Weible, Christopher M. 2005b. “An Advocacy Coalition Approach to Policy Networks.”
1183 *Political Research Quarterly* 58(3): 461–75.

1184 Weible, C. M., Ingold, K., Nohrstedt, D., Henry, A. D., & Jenkins-Smith, H. C. (2019).
1185 Sharpening advocacy coalitions. *Policy Studies Journal*. Wilson, Carter. 2000. “Policy
1186 Regimes and Policy Change.” 20(3): 247–74.

1187 Yordy, Jill et al. 2019. “Framing Contests and Policy Conflicts over Gas Pipelines.” *Review of*
1188 *Policy Research* 36(6): 736–56.

1189 Zafonte, Matthew, and Paul a. Sabatier. 2004. “Short-Term Versus Long-Term Coalitions in the
1190 Policy Process : Automotive Pollution Control, 1963 – 1989.” *The Policy Studies Journal*
1191 32(1): 1963–89.

1192 Zilliox, Skylar, and Jessica M. Smith. 2018. “Colorado’s Fracking Debates: Citizen Science,
1193 Conflict and Collaboration.” *Science as Culture* 27(2): 221–41.

1194

1195

1196

1197

1198

1199

1200
1201

1202
1203
1204
1205
1206
1207
1208
1209
1210
1211
1212
1213
1214
1215
1216
1217
1218
1219
1220
1221
1222
1223
1224
1225
1226
1227
1228
1229
1230
1231
1232
1233
1234
1235
1236
1237
1238
1239
1240
1241
1242

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.

1243
1244
1245
1246
1247
1248
1249
1250
1251
1252
1253
1254
1255
1256
1257
1258
1259
1260
1261
1262
1263
1264
1265
1266
1267
1268
1269
1270
1271
1272
1273
1274
1275
1276
1277
1278
1279
1280
1281
1282

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)

1283
1284
1285
1286
1287

APPENDIX B
STATISTICAL SIGNIFICANCE OF ISSUE FRAMING OVER TIME

t-Test: Two-Sample Assuming Equal Variances

Anti- Coalition New York		
	<i>Before</i>	<i>After</i>
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		
	<i>Before</i>	<i>After</i>
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	

1288
1289