

**How Cognitive and Behavioral Characteristics Shape Conflict in Colorado's Oil and Gas
Subsystem. An Application of the Policy Conflict Framework**

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Introduction

Policy conflicts, especially in today's political climate, are an increasingly prevalent part of public policy. Despite this, policy theories typically relegate policy conflicts to the background and do not directly measure or conceptualize them (Weible and Heikkila 2017; Heikkila and Weible 2017). The Policy Conflict Framework (PCF), however, offers a way to guide and to organize policy conflict and brings their study to the foreground (Weible and Heikkila 2017). The PCF, which can enhance policy conflict knowledge at both a generalized and at a localized level, defines an episode of policy conflict as follows: "where two or more policy actors express certain cognitive and behavioral characteristics over a short or long period of time" (Weible and Heikkila 2017, 2). This paper offers an application of the PCF to the case of hydraulic fracturing in Colorado using an inductive and thematic approach to qualitative interview data. While previous applications of the PCF have examined this particular policy setting, these applications, examined news media (Yordy et al. 2019), used different data derived from surveys, and studied the issue as a whole, without making distinctions across policy action situations (Heikkila and Weible 2017). Similar to Weible and Heikkila (2020), which expands on Heikkila and Weible (2017) to include a discussion of both the PCF's cognitive and behavioral characteristics, this paper offers a PCF application that also studies both the cognitive and behavioral characteristics.

The paper proceeds as follows. The paper first overviews the PCF and its components. Next, the paper offers a description of hydraulic fracturing in Colorado; provides background on policy conflicts in two policy action situations, Wadley Farms and Boulder County; and discusses the data collection method. The paper then directly applies the PCF to the interview data and offers some concluding thoughts.

Overview of the Policy Conflict Framework

The PCF's ultimate goal is to understand episodes of policy conflict. To do this, the PCF examines episodes' cognitive and behavioral characteristics—aspects of the related policy setting—and the feedback effects—outputs and outcomes—on the setting (Weible and Heikkila 2017; Heikkila and Weible 2017). The PCF is also able to tease out the characteristics of policy conflicts and policy actors, or people directly involved with affecting policy processes (Heikkila and Weible 2017). The paper emphasizes policy actors as they typically have expertise related to the conflict and they actively participate in the conflict to influence policy processes, which can impact societal issues (Sabatier 1991; Heikkila and Weible 2017).

The PCF makes the following three main assumptions. First, the PCF assumes that policy conflict episodes occur at three different, but interconnected polycentric levels of action: political system, which “governs a territory and exercises generic authority across a range of policy issues” at the national or subnational level of government in federal systems; policy subsystem, which is “any partition of a political system that focuses on a policy topic, a locale, and the actors involved”; and the policy action situation, which are “diverse arenas within political systems and policy subsystems that include formal and informal venues where policy actions engage, debate, and attempt to address problems around policy issues” (Weible and Heikkila 2017, 2-3; Heikkila and Weible 2017; Ostrom 2005).

Following the work of policy scholars and cognitive psychologists, the PCF's second assumption is that individuals are constrained by cognitive limitations in terms of their ability to interpret, process, and access information (Heikkila and Weible 2017). They “remember losses more than gains” (loss aversion), “selectively attend to information that comports with their beliefs” (selective attention), identify more positively with members of their own groups and

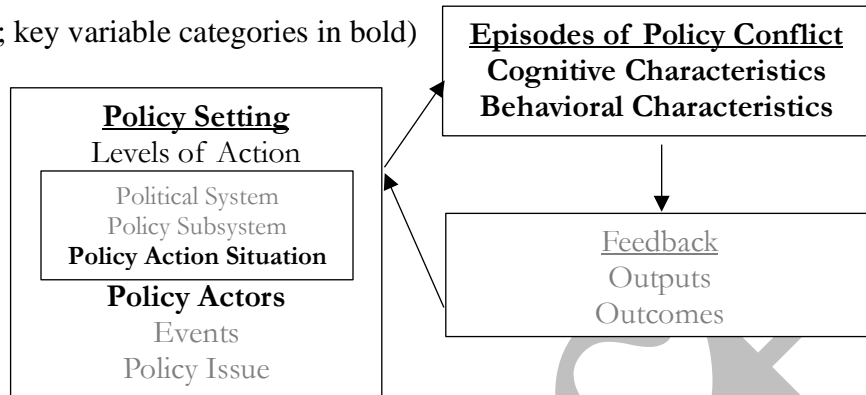
more negatively with those not in their group (biased assimilation), and use heuristics and emotion to advise their decision making (Heikkila and Weible 2017, 3; Weible and Heikkila 2017; Kahneman and Tversky 2013; Jenkins-Smith et al. 2014). The PCF's third assumption is that policy conflicts are not inherently bad or good; depending on the degree of intensity and the impact from the conflict, policy conflicts can have either unhealthy or healthy societal outcomes at any particular level of action (Heikkila and Weible 2017; Weible and Heikkila 2017).

In the PCF, there are three dimensions to the cognitive characteristics of policy conflicts: divergence in policy positions, degree of perceived threats from others' policy positions, and unwillingness to compromise on policy positions (Weible and Heikkila 2017; Heikkila and Weible 2017). Divergence in policy positions centers on the "degree to which [policy] actors express differences on the formation, adoption, or implementation of public policies" (Weible and Heikkila 2017; 5). The degree of perceived threats from others' policy positions is the "degree to which [policy] actors believe that the policy positions of others will impose costs, harm, or other negative consequences to themselves or society" (Weible and Heikkila 2017, 6). Unwillingness to compromise is the "degree to which policy actors are willing to change their views on a policy position" (Weible and Heikkila 2017, 6).

The cognitive characteristics are an indicator of a policy conflict's level of intensity and link to behavioral characteristics (Weible and Heikkila 2017). At the same time, the policy setting, which includes four "interactive conceptual categories" i.e., events, levels of action, policy issues, and policy actors, condition the policy conflict (Weible and Heikkila 2017, 6). (See Appendix A for categorical concept definitions of the PCF.) The behavioral characteristics of policy conflict include the political strategies and tactics of individuals to indirectly (e.g., protests, coalitions, narratives) and directly (e.g., lobbying and voting) influence the feedback

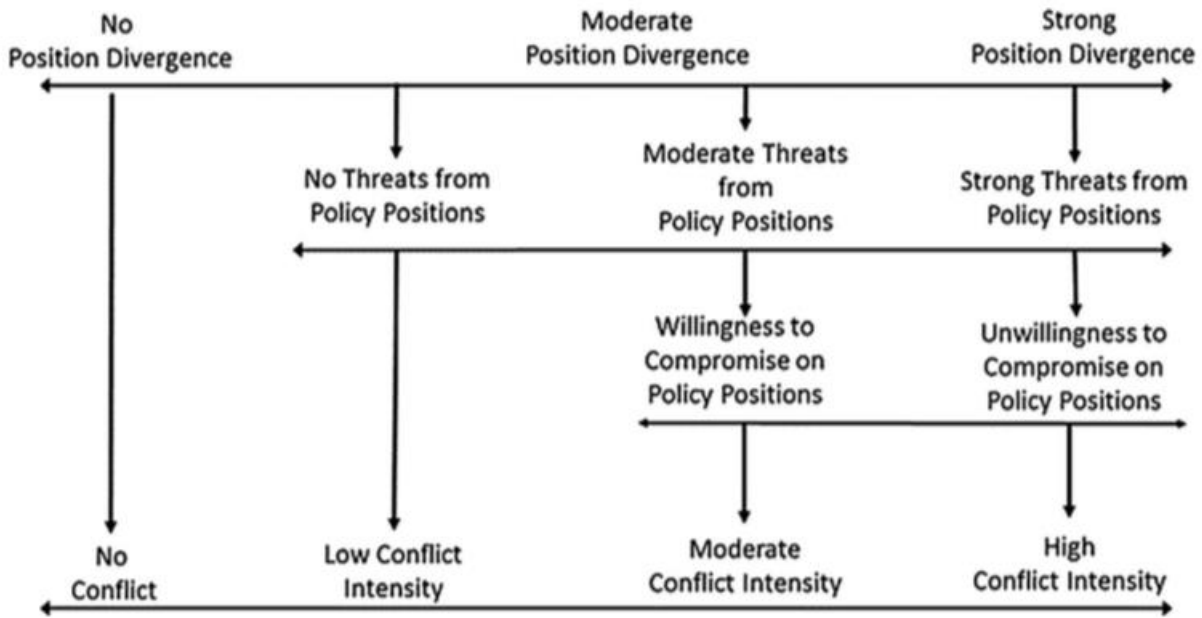
effects (Weible and Heikkila 2017). The feedback effects, exhibited through outputs and outcomes, represent the continuity of a policy conflict episode (Weible and Heikkila 2017). The outputs are “changes or deliberate continuations of public policies, institutions of policy action situations, or actors holding elected positions of a political system, a policy subsystem, or policy action situations” and the outcomes are the “effects from outputs and policy conflict characteristics on a policy setting” (Weible and Heikkila 2017, 6). Figure 1 demonstrates a flow diagram of the PCF. Applying a subset of the PCF, this paper focuses on one policy issue, unconventional oil and gas development, and emphasizes the relationship between policy actors’ attributes within the policy setting (i.e., Colorado’s oil and gas subsystem), and the cognitive and behavioral characteristics of the policy conflict. It leaves unexplored the feedback effects, i.e., outputs and outcomes, and other aspects of the policy setting, i.e., events and attributes of different levels of action. See Figure 1 for a PCF flow diagram where the paper’s key variable categories appear in bold font. This paper focuses on these specific variable categories for two main reasons. First, the paper’s research context and data collection method are most relevant to these components of the framework. The paper emphasizes policy actors as they are actively engaged in influencing the oil and gas policy process, which shapes societal outcomes (Heikkila and Weible 2017). Additionally, analyzing the essence of a policy conflict between policy actors within a specific subsystem offers a method for aggregating data to understand what is the subsystem’s conflict level. Second, the paper attempts to add to the scant literature on the PCF’s cognitive and behavioral characteristics; the author is familiar with only one other paper that explores both the cognitive and behavioral characteristics (Weible and Heikkila 2020).

Figure 1: Flow diagram of the Policy Conflict Framework (Adapted from Heikkila and Weible 2017; key variable categories in bold)



While a policy conflict’s cognitive characteristics occur at the individual level in policy actors’ minds, scholars implementing the PCF can aggregate these individual-level characteristics in order to offer insight into policy conflicts and their intensity across policy action situations (Heikkila and Weible 2017). If a policy actor perceives a high degree of divergence in policy positions, perceived threats from those who do not share the policy actor’s position, and exhibit an unwillingness to compromise, then the policy conflict will reflect a high intensity level (Weible and Heikkila 2017). If, however a policy actor does not have a divergent policy position, then there is “high policy concord” among policy actors and thus, no conflict (Weible and Heikkila 2017, 8). If policy actors have moderate position divergence and moderate perceived threats, then the policy actor will likely exhibit willingness to compromise and the conflict’s intensity will be at a moderate level. Similarly, if policy actors have moderate position divergence and no perceived threats, then they are less likely to perceive a need to compromise and the conflict will be at a low level of intensity (Weible and Heikkila 2017). See Figure 2 for an illustration of the interactions between the cognitive characteristics and how they relate to a conflict’s intensity. The manner in which the cognitive characteristics indicate a policy conflict’s level of intensity is particularly important as this paper tests the expected relationships.

Figure 2: Illustration of policy conflicts’ intensity spectrum (From Weible and Heikkila 2017).



What follows is a broad description of the sources of conflict over hydraulic fracturing, a discussion of the case selection of Colorado, background information on the policy action situations of Wadley Farms and Boulder County, and the data collection and research methods used to apply the PCF to these cases.

Sources of conflict over hydraulic fracturing

The United States Energy Information Administration (USEIA) predicts significant growth in global energy demand and a corresponding 45 percent increase in global energy consumption from 2012-2040 (USEIA 2016). To meet rising energy demands, U.S. hydrocarbon production from shale resources has continued to grow,¹ primarily driven by an increase in horizontal drilling efficiency from a process known as high volume horizontal hydraulic fracturing (USEIA

¹ *PR Newswire* (2016) predicts that the global hydraulic fracturing and services market will grow at a 9.3% compound annual growth rate by 2025.

2014). Hydraulic fracturing² involves injecting sand, water, and chemical additives under high levels of pressure thousands of feet below ground into oil and gas reservoirs and wells to extract hydrocarbons (i.e. oil and natural gas) (USGS 2016; COGCC 2016).

As the hydraulic fracturing market has increased, so has the contentiousness of the extraction method. Proponents of oil and gas development that uses hydraulic fracturing maintain that it has the following benefits: it creates jobs, reduces carbon emissions, boosts the economy, lowers the cost of energy, and reduces U.S. reliance on foreign oil (Helman 2013). Opponents, however, are concerned with many types of potential environmental and health hazards (DeSmogBlog 2010). Among these are possibilities of groundwater, drinking water, and soil contamination; release of greenhouse gases, such as carbon dioxide and methane; increased water consumption; and potential increased seismic activity (DeSmogBlog 2010).

With the expansion of oil and gas wells across the nation, researchers have begun to speculate on the numbers of Americans potentially impacted by their proximity to wells. Some estimate that at least 15.3 million American people live within one mile of a well that has been drilled since the year 2000 (Gold and McGinty 2013), while others estimate this number to be 17.6 million Americans living within 1,600 meters (~1 mile) of one or more confirmed active oil or gas wells (Czolowski et al. 2017). Considering the popularity of this extraction method, its potential for encroachment on urban and suburban areas, and many related environmental and public health concerns—the proximity of these wells to schools, homes, hospitals, and natural

² In this paper, the term hydraulic fracturing refers to the process of fracturing rock formations and includes the entire process, from pre-drilling activities—such as sub-surface lease negotiations—to the drilling itself, to post-drilling activities—such as transmitting oil and gas to consumers.

features, and the ability to regulate the practice—is of great interest to those living in and near communities with active oil and gas development.³

In many instances,⁴ the public has sought local control over hydraulic fracturing⁵ despite the fact that U.S. states typically have primary regulatory authority (UCS 2015). As the primary regulator, the state decides how much regulatory discretion to bestow upon the local level (UCS 2015). Many states have elected to retain their regulatory authority, which has led to regulatory conflict with local governments (Golten, Ward, and Mutz 2016; UCS 2015).

This regulatory conflict is beginning to shift somewhat in Colorado. On April 16, 2019, Governor Jared Polis signed Senate Bill (SB) 181 “Protect Public Welfare Oil and Gas Operations” into law (Lyon and Tartaglia 2019). SB 181 allows local governments to regulate the surface impacts of development and allows local governments to implement minimization measures to the extent necessary to protect public health, safety, and welfare, and the environment (Tartaglia 2019). It also gives the Colorado Oil and Gas Conservation Commission (COGCC), the state regulator of oil and gas development in Colorado, more direction to enact new emissions rules,⁶ changes the composition of the COGCC⁷ (Tartaglia 2019), and shift’s the COGCC’s mission from “fostering” the oil and gas sector to “regulating” it (Lyon and Tartaglia 2019).

³ The practice of hydraulic fracturing has become so controversial that many U.S. cities, counties, and states, as well as foreign nations—among them Wales, Scotland, France, Germany, and Bulgaria—have either issued moratoria or bans on the practice (Keep Tap Water Safe 2016).

⁴ Keep Tap Water Safe (2019) keeps a running list hydraulic fracturing bans worldwide.

⁵ Colorado citizens sought to pass Ballot Initiative 75, Colorado Local Control of Oil and Gas Development Amendment; this would have amended the state constitution to allow local governments the authority to regulate oil and gas development, to include banning the practice, within the confines of their town’s geographic border (Ballotpedia 2016). Initiative 75, however, failed to qualify for the November 2016 ballot (Ballotpedia 2016).

⁶ Specifically, the COGCC must minimize emissions of methane, volatile organic compounds (VOCs), and nitrogen oxides (NOx) (Tartaglia 2019).

⁷ Previously the COGCC had nine members, three of whom had significant oil and gas experience; effective July 1, 2020, the COGCC will have seven members, one with significant oil and gas experience as well as one expert each in planning and land use; reclamation or environmental and wildlife protection; and public health (Tartaglia 2019).

Why study Colorado?

This paper emphasizes the case of Colorado for studying policy conflicts for several reasons. First, Colorado has been a front-runner in oil and gas development that uses hydraulic fracturing, is the fifth-largest natural gas-producing state⁸ (USEIA 2019), and is home to 11 of the nation's 100 largest natural gas fields (USEIA 2019).⁹ Second, the practice of hydraulic fracturing in Colorado has been particularly contentious.¹⁰ Colorado's robust economic growth (Mullis et al. 2016) and rapid population growth (Murphy 2016) has witnessed oil and gas development's encroachment on suburban and urban areas (Davis 2012; Golten, Ward, and Mutz 2016; Shaffer, Zilliox, and Smith 2017), which has, in turn, led to conflict between state and local governments and between citizens and industry. Third, Colorado is a bellwether state. It has more stringent regulations than many other oil and gas producing states (Davis 2012; Richardson, Krupnick, and Wiseman 2013), was the first state to regulate oil and gas produced methane emissions, was an early adopter of the requirement to publicly disclose chemicals in hydraulic fracturing fluids (Heikkila et al. 2014; Rinfret, Cook, and Pautz 2014; Shaffer, Zilliox, and Smith 2017), and, with SB181, allows greater local government control of hydraulic fracturing.

Data collection and analysis

This paper emphasizes two policy action situations, Wadley Farms and Boulder County.

⁸ According to the U.S. Energy Information Administration (USEIA), in 2017 Colorado ranked sixth in terms of marketed natural gas production, whereas Texas, Pennsylvania, Oklahoma, Louisiana, and Ohio ranked one through five, respectively (USEIA 2017)

⁹ The state's crude oil production has also quadrupled since 2010, partly due to the increased use of hydraulic fracturing (USEIA 2019a). The Colorado BLM (2017) estimates that ninety percent of 2017 wells drilled in Colorado were hydraulically fractured indicating that most new wells drilled in the state use hydraulic fracturing in their exploitation. The Colorado BLM (2017) estimates that ninety percent of 2017 wells drilled in Colorado were hydraulically fractured.

¹⁰ The cities of Boulder (and Boulder County), Broomfield (City and County), Fort Collins, Longmont, and Lafayette have all sought to ban or enact moratoria against hydraulic fracturing (Antonacci 2016).

The author generated a list of interviewees from the following resources: newspaper articles; social media; online reports, public hearings and testimony; complaints to the Colorado Oil and Gas Conservation Commission (COGCC), the state regulator of hydraulic fracturing in Colorado; and recommendations from interviewees. This method identified a wide variety of policy actors that had been or are currently involved in the conflicts: journalists; municipal, county, and state-level employees and/or elected officials; citizen and environmental group members; oil and gas industry employees; and those in the legal field. Both Wadley Farms and Boulder County sit atop the same geologic structural basin, the Denver-Julesburg Basin, or D-J Basin, underlying the Denver metropolitan areas along the Front Range.

The author conducted 13 semi-structured interviews for these two conflicts, eight for the Boulder County conflict, and five for the Wadley Farms conflict. The author interviewed the following policy actors for these two conflicts: journalists, oil and gas industry employees, municipal government elected officials, county government employees and elected officials, state government employees, and citizen and environmental group members. Leaving the choice of in-person or phone interview up to the interviewee, the author conducted 10 phone interviews and three in-person interviews between April and September 2017. Interviews lasted between 26 and 90 minutes each, with an average interview time of approximately 43 minutes.

With the exception of one interview where the interviewee declined to be recorded, the author recorded and transcribed all interviews verbatim. A research team at University of Colorado Denver designed an interview guide (see Appendix B) to understand how policy actors tell their stories of conflict e.g., what attributes do the conflicts have and what does its evolution look like. The interview guide allowed the flexibility for interviewees to tell their story and to discover important aspects of their stories, while also offering some more explicit

standardization across the interviews to keep the conversation going. The interview protocol emphasized the cognitive characteristics of the conflict, disagreement on positions, threats, and unwillingness to compromise; behavioral characteristics of the conflict, actions and strategies taken to influence the conflict; the feedback effects, the outcomes/outputs of the conflict; and the sources of the conflict.

This paper applies a subset of the PCF by examining the cognitive and behavioral characteristics of the policy conflict at the policy action situation level of action. Following the transcription process, the author thematically and inductively analyzed the interviews for evidence of the PCF. To analyze the interview data, the author took an iterative approach. First, the author condensed interview transcripts into bullet points and pulled out themes and relevant quotes. She then further distilled the interview data to create a spreadsheet that easily allowed for comparison across policy action situation and policy actor affiliation. She based the spreadsheet on the interview protocol for identifying the presence or absence of the cognitive and behavioral characteristics and also gathered any relevant information on the feedback effects. Specifically, she coded for the cognitive characteristics in the spreadsheet. She split the degree of perceived threats and the unwillingness to compromise each into two categories (for a total of four categories for these two cognitive characteristics): self and others. When the cognitive characteristic was clearly present for either the policy actor or their opinion of the others, she assigned it a “1.” When the cognitive characteristic was partially present e.g., in the case of the unwillingness to compromise, or depended on either the actions of another policy actor, or the policy actor questioned what the compromise was, the author coded it as “0.5.” If the policy action clearly stated an unwillingness to compromise, the author coded this as a “0.” Appendix D provides the codebook the author used.

Background on the policy action situations

The Boulder County and Wadley Farms¹¹ conflicts have a wide array of policy actors involved and they both sit atop the same geologic structural basin, the Denver-Julesburg Basin, or D-J Basin, underlying the Denver metropolitan areas along the Front Range. What follows is background information on the individual policy action situations.

Wadley Farms

In the first part of 2015, Synergy Resources Corporation announced a proposal to drill 20 wells on a 35-acre empty field in the middle of the Wadley Farms neighborhood in unincorporated Adams County (Ray 2016; Aguilar 2015). Wadley Farms, near Thornton, has 120 homes that are mostly rural horse properties and is located approximately 1,000 feet from the Rocky Top Middle School and near the Little League's Northern Lights baseball club fields (ACCDAN n.d.; Aguilar 2015). Residents of Wadley Farms and the surrounding area organized to prevent drilling in residential neighborhoods. In August 2015, residents of Wadley Farms, Hunters Glen, Fallbrook Farms, Cherrywood, York Crossing and other neighborhoods in Adams County formed Adams County Communities for Responsible Drilling Now (or ACCDAN; ACCDAN 2015; ACCDAN n.d.). ACCDAN, which received federal 501 (c)(3) nonprofit status in May 2016 (ACCDAN 2016), has the mission to, "provide community education, public information and increased awareness regarding the potential impact of large scale oil and gas development on neighborhoods in Adams County. Examples of education initiatives will include increased setbacks, greater safety, health, environmental, water quality and quality of life protections; while still allowing for responsible extraction of oil and gas" (ACCDAN 2015; ACCDAN n.d.;

Concerned residents flooded meetings of the Thornton City Council and the Adams County

¹¹ The data collection for these cases was part of a broader study of local-level conflicts in Colorado, which sought to examine 12 action situations.

Board of County Commissioners with their misgivings over environmental, public health, and safety issues (Sahling 2015).

As a result of citizens' concerns, in February 2016, the Board imposed a six-week moratorium on new oil and gas sites that were within 1,500 feet of homes or public buildings inside Adams County's urban growth boundaries (Illescas 2016; Adams County 2016). The Board put moratorium in place to reexamine and update its memorandum of understanding (MOU) process, which the Board uses to govern oil and gas development in the county; the MOUs signed with industry operators hold operators to more stringent standards than what the state mandates (Ray 2016; Sealover 2016). Following the end of the brief moratorium, Adams County created two, full-time positions—one as a local government designee to the state regulator, the Colorado Oil and Gas Conservation Commission (COGCC) and the other as a local oil and gas inspector (Ray 2016). Additionally, the Board approved a pending MOU with Synergy (Ray 2016). In May 2016, Synergy announced that it was consolidating its holdings in Weld County; Synergy purchased assets from Noble Energy and sold its holdings in Adams County, which included the Wadley Farms site, to Ward Petroleum (Dunn 2016). Since then, Ward Petroleum announced plans to drill laterally from the existing Ivey site, which it also purchased from Synergy, rather than attempting to directly drill in Wadley Farms (Taylor 2017).

Boulder County

While the conflict in Boulder County is similar to that of the Wadley Farms site, the conflicts in Boulder are at a higher level of intensity, which is exhibited by the duration of bans and moratoria put in place at the city and county levels. In 2012, for example, the City of Longmont banned hydraulic fracturing within city limits, and in 2013, the City of Lafayette passed a community bill of rights, which recognized residents' right to clean water, air, and a renewable

energy future; Lafayette saw hydraulic fracturing as a violation of those rights and thus banned future oil and gas drilling (Mazza 2017; East Boulder County United n.d.). In 2013, the City of Boulder also put in place a five-year moratorium on oil and gas development (Mazza 2017; East Boulder County United n.d.).

In addition to individual cities placing bans and moratoria on hydraulic fracturing, there was also a county-wide effort to restrict oil and gas development within unincorporated areas of the county. On February 2, 2012, for example, Boulder County's Board of County Commissioners passed a moratorium on processing required development plans for oil and gas permits. While the Board originally set its expiration date as August 2, 2012, the Board extended or re-imposed the moratorium a total of eight times; the most recent moratorium lapsed on May 1, 2017 (*State of Colorado v. County of Boulder Colorado* 2017). For a more detailed history of the Boulder County moratorium, see Appendix C. Following the May 2, 2016 Colorado Supreme Court issued its decision in *City of Longmont* and *City of Fort Collins*, declaring that Longmont's ban and Fort Collins' five-year moratorium violated state law. On January 26, 2017, Cynthia Coffman, the State of Colorado Attorney, sent a letter to the Board mandating that the Board rescind the moratorium in light of the Supreme Court's decision (*State of Colorado v. County of Boulder Colorado* 2017). The Board replied to the letter and indicated that it needed to update its local regulations and on February 14, 2017, the Attorney General's office filed suit against Boulder County for allowing the continuation of the moratorium (*State of Colorado v. County of Boulder Colorado* 2017; Chow 2017). The Colorado Oil and Gas Association (COGA) and the American Petroleum Institute (API) joined the lawsuit on February 24, 2017 as intervenors and on May 2, 2016, Boulder County District Judge Norma Sierra granted the county's motion to

dismiss the lawsuit as the moratorium expired on May 1st; the Attorney General's office accepted the dismissal (Fryar 2017).

Thematic overview of the conflicts

Both the Wadley Farms and Boulder County conflicts generally encompassed three main and interrelated conflicts, classified as policy issues in the PCF: the location of wells, regulatory authority of oil and gas development, and environmental and public health issues related to hydraulic fracturing. Additionally, some interviewees spoke about underlying political i.e., the divergent policy positions of Colorado Democrats and Republicans on this issue, and democratic elements i.e., the ability to self-govern and the need to resort to civil disobedience to accomplish the desired goal. At the same time, there were also divergent policy positions, between the industry and other policy actors over the economic gains from hydraulic fracturing. For conflicts surrounding the location of oil and gas development, wells were in or near residential areas. At its heart, the conflict over location stems from a broader conflict over state versus regulatory control of oil and gas development. As subdivisions of state government, the Colorado General Assembly places much of the responsibility and control of land use at the local level of government (county municipal levels) (DOLA 2012, 2). Counties typically have land use authority within unincorporated areas of the county and municipalities have land use authority within their borders. The Local Government Land Use Control Enabling Act grants the authority of local governments to regulate “the use of land on the basis of impact thereof on the community or surrounding areas,” and allows local government to otherwise plan for and regulate “the use of land so as to provide planned and orderly use of land and protection of the environment in a manner consistent with constitutional rights” (DOLA 2012, 2). The 2016 Colorado Supreme Court decision, however, made it clear that this local land use regulatory

authority does not apply to decisions that would impact oil and gas development. At the time of the conflict in Colorado, the regulatory authority of oil and gas development was the purview of the Colorado Oil and Gas Conservation Commission (COGCC).¹² Thus, in concert with rules governing oil and gas development, the COGCC has had the land use authority to decide whether a location is appropriate for development.

Related to the conflict over the location of well sites and regulatory authority is the potential for environmental, and public health and safety impacts from hydraulic fracturing. In terms of the policy actor level, conflicts have erupted between citizens—either those living in or near the Wadley Farms neighborhood or those living near proposed oil and gas development in Boulder County—and the oil and gas industry and/or between citizens and their local government (at both the county and municipal level). Additionally, the oil and gas industry has also had conflicts with local governments (at both the county and municipal level). At the same time, there have been also been conflicts between citizens, which relate to their approach for resolving conflicts either with industry or with local government.

PCF Results

Evidence of cognitive characteristics

As previously noted, the PCF includes the following three cognitive characteristics: divergence in policy position, degree of perceived threats, and unwillingness to compromise.

Divergence in policy positions

All policy actors, regardless of organizational affiliation, perceived that there were competing positions held by different actors in the system. While there was variation across policy actors, policy actors with the same affiliation tended to perceive the existence of divergent policy

¹² As previously mention, SB181 gave greater control to local governments.

positions in similar and sometimes overlapping ways. Citizen/environmental group members, for example, tended to describe policy positions in terms of location. One Wadley Farms citizen/environmental group member, for example, stated that industry “has the right by law to essentially run roughshod over all of the neighborhoods, homeowners, etc.” This group member thus perceived a divergent policy position from industry in that industry believes it operates safely and within the law. Another Wadley Farms citizen/environmental group member had the position that, “large-scale oil and gas development...does not belong in the middle of a neighborhood.” A secondary description for citizen/environmental group members related to concern for the environment, and public health and safety. Although the COGCC has a two-pronged mission, to both facilitate oil and gas development and to protect the environment, public health and safety, a Boulder County citizen/environmental group member referred to the agency as basically “a how-to agency. They represent the industry even though they’re a government agency. But they, their mission as they see it, that is, it more or less says it in part of their mission statement, is to facilitate oil and gas development. So, they take that literally.”

Local government (elected officials or employees at either the municipal or county level) tended to describe the conflict in terms of regulatory authority and the environmental and public health and safety impacts of hydraulic fracturing. One former Boulder county official, for example, said that, “from the county perspective [...] we view that we ought to have the same type of land use authority that we would have over essentially any other type of [...] development that would take place in the county.” From the interviewee’s perspective, county governments have comprehensive plans, which county officials use to guide land use decisions and maintained that, “they ought to be able to have the ability to say, ‘No. That’s inappropriate.’” The 2016 Colorado Supreme Court ruling, however, took away a tool that local governments had

been using to protect residents and asserted state supremacy over land use authority that relates to oil and gas development. According to the interviewee, the Colorado Supreme Court was “asserting state control I think pretty clearly for the benefit of industry, not for the benefit of the broader public.” Another Boulder county official seconded the concerns over regulatory authority and mentioned that most of the conflict comes from, “a [powerless] feeling in that realization that we don’t actually have the authority to [...] make decisions about whether, and where, and how, and when,” which is very difficult for both the public and elected officials to understand. A county official involved in the Wadley Farms conflict echoed the sentiments of the Boulder County officials. The interviewee felt that local government was better equipped to regulate the siting of oil and gas wells because they are more familiar with the area itself and that the COGCC neither has the local government experience nor the understanding of the issue.

Some local government policy actors also described the conflict in terms of well location. One elected county-level official involved in the Wadley Farms conflict, who supports “responsible” oil and gas development, for example, said that, “I don’t think responsible drilling is [in] urban neighborhoods.” The interviewee believes that hydraulic fracturing is an industrial activity and therefore it should not be located near people’s homes. Another local government official, who is at the municipal level and has ties to a more moderate environmental group also agreed that “drilling in populated areas is overstepping.” Thus, at times policy actors’ positions do not always follow clear lines of division based solely on their affiliation.

A member of the moderate environmental group that the municipal official worked with during the Wadley Farms conflict, who is involved in its day-to-day operations, had a different opinion on the issue of regulatory control. Their group believes that the cities and counties do not have the “expertise” or the “right staff” to make a decision about how far away from a flow line

is a safe distance to put a house” and that it should be regulated at the state level. Local government wants control, the interviewee went on to say, because the “state isn’t protecting them [...] the state regulations have a gap. [...] if the state’s not going to do it, the local government needs the authority to be able to do it. But with that authority comes responsibility and they need to, to hire the right people and actually make the decisions based on a potential risk.” Thus, some environmental groups have also framed the conflict in terms of regulatory control, even though they may feel that local governments are ill-equipped to effectively govern oil and gas development.

Both industry representatives interviewed for each conflict felt that they operated safely and framed the conflict in terms of the economic and other benefits that their industry provides to the counties and cities in which they operate. The Wadley Farms industry representative, for example maintained that it is understood that “everyone that makes a living in Greeley was being supported by the oil and gas industry in some capacity.” The journalist, however, brought up the subject Greeley, which has oil and gas wells within their city limits, without being prompted. The interviewee said that while the industry does “bump the tax base,” you do not visit Greeley and say that it is a “prosperous little town.” The interviewee also mentioned that Colorado has one of the “lowest severance tax rates in the country.” The industry, the interviewee said, does provide “some well-paying jobs, but most of the profits go elsewhere.” Both the journalist and a member of a more extreme Boulder County environmental/citizen group pointed out that Crestone Peak, the company proposing to hydraulic fracture Boulder County is 95 percent owned by the Canadian pension fund. The environmental group member also highlighted the fact that the workers on the rig are not local and that the Chief Executive Officer (CEO) of Crestone Peak is Tony Buchanon, who is the former CEO of Bonanza Creek Energy, which went bankrupt a

few years ago “to the tune of \$850 million.” The interviewee believed that if the company goes bankrupts that the local community would be “left with a bunch of toxins and with the cleanup.” Thus, the industry actors clearly have divergent viewpoints from other policy actors on the economic benefits that their industry provides to the locations of their oil and gas facilities. At the same time, there is overlap in terms of how individuals frame policy positions across policy actor affiliation.

Perception of perceived threats from policy positions

The ways in which and by whom interviewees personally felt threatened varied across interviewees, both across policy action situations and within policy actor affiliations, in response to the question, “Did/do you feel threatened by the positions others are taking on this issue? If so, how and in what ways.”. Policy actors tended to perceive threats from a variety of sources, namely, more extreme anti-hydraulic fracturing citizen/environmental groups also known as “fractivists,” the oil and gas industry, county commissioners, and politicians; some interviewees also mentioned feeling both physically and politically threatened.

With the exception of four policy actors, all interviewees personally perceived threats from others’ policy positions and felt that others also perceived threats as well. A member of a more moderate citizen/environmental group in the Wadley Farms conflict said, for example, “interestingly, the most threatened I felt was actually by the anti-fracking organization...Because our organization does, takes a relatively moderate stance, in that we’re not anti-oil and gas.” The Boulder County industry representative echoed this sentiment. The interviewee commented on the “extremism” on the anti-fracking side and said that, “It’s not just a debate on the issue. It almost goes to a personal level at a certain point.” The interviewee also answered in the affirmative when asked whether they had been the target of a smear campaign, “Yeah. That’s daily.” The

interviewee went on to say, “We employ security not because we like it.” An elected, Boulder County official also cited the “invasive” nature of anti-fracking groups’ tactics, which “provides some anxiety.” Interestingly two interviewees, an elected Boulder County official (who was not serving at the time of the incident) and a former Boulder County official (who was serving at the time) cited the same incident involving anti-fracking members. The former Boulder County official, for example referenced a time where member of an anti-fracking organizations “chased a woman from Encana who had spoken at a hearing, basically chased her out of the building and were pounding at her car, telling her to get out of the county, a totally inappropriate behavior.”

These officials were not alone in feeling threatened by anti-fracking groups. A Wadley Farms member of a moderate citizen/environmental, for example mentioned that the City of Thornton put in extra security, such as bullet-proof glass, and had a police presence at their city council meetings “because of the hostility” from anti-fracking organizations. At the same time, the police would come to their group’s meetings as elected officials were in attendance. The interviewee went on to describe an instance where they were “verbally attacked” for refusing to sign the more extreme group’s petition.

Some interviewees also perceived threats coming from the oil and gas industry, politicians and county commissioners, and felt physically and political threatened. A citizen/environmental group member interviewed for the Wadley Farms conflict, who is also an elected Boulder County official, said, for example, “I definitely felt threatened by the Synergy side of it.” A Wadley Farms citizen/environmental group member also felt that “the oil and gas industry, anytime you call them into question about their practices or operations...[would] automatically get dinged as fractivists, being anti-oil and gas.” A member of a more extreme citizen/environmental group in Boulder County said of the oil and gas industry, “They’re

definitely the enemy.” This same interviewee also mentioned feeling threatened by the Boulder County Commissioners and by “politicians because they are working with oil and gas.” Another member of this same group, who is also an elected, municipal-level official, said the following: “Do I think somebody’s coming to my house and break a window? Yes... There’s some wackos out there.” Finally, one elected county official in the Wadley Farms conflict confessed to feeling politically threatened by the “Republican side since I’m a Democrat and the fact that... gas and oil only supports Republicans when it comes to election time.”

Three policy actors, one Boulder County citizen group member, one Wadley Farms industry interviewee, and a journalist interviewed for the Boulder County conflict, believed that others perceived threats from policy positions, but they did not feel personally threatened. The Boulder County citizen/environmental group member, for example, maintained that citizens “are being threatened and feel their lives, their homes, their health, their families, their children are being threatened.” At the same time, when the interviewee has made presentations on hydraulic fracturing, people in the audience have “strongly disagreed with me,” but “they’re not personally threatening.” The interviewee remarked, however, that “some fairly radical people” had attacked the interviewee’s organization for “not doing enough.” While the Wadley Farms industry representative did not feel personally threatened, when asked about whether other people felt threatened, the interviewee remarked that “I think if they have that much [regulation] passing then they must.” The journalist made the following statement, “I don’t think the oil and gas industry takes very kindly to people who challenge them. But I have never personally been challenged.” The journalist also said, however, that “the will of the people who are more directly affected by this residential drilling is not being heeded,” indicating that others feel threatened. A fourth policy actor, a local, county-level government employee in Boulder County was unsure of

whether they would “characterize it as threatened,” and thought of the conflict more in terms of different positions and would not “speak for other folks” in terms of others’ perceived threats.

Unwillingness to compromise on policy positions

In terms of the third cognitive characteristic, unwillingness to compromise, there was again variation across policy action situation and policy actor affiliation. Only two interviewees, policy actors in the Boulder County conflict, said that they were unwilling to compromise, though they both felt that others were willing to compromise. One interviewee is a member of a more extreme citizen/environmental group and the other is an elected member of the local government at the municipal level who also works with the same citizen/environmental group. Whether the environmental/citizen group’s end goal was to ban hydraulic fracturing ultimately influenced the group’s willingness to compromise. If the group was seeking a ban, then they were unwilling to compromise. The municipal official who worked with the more extreme group, for example, referred to the industry as “a behemoth with incredible amounts of money.” The interviewee went on to say, “There is no compromising when one side has all the power and money and the other side has nothing. What’s the compromise? You get shit.” Similarly, the other member of the extreme group said, “there’s not any compromise, I mean, we do not want to be poisoned just a little.”

Seven interviewees, however, were willing to compromise personally or compromise within their organizational role. Of these seven people, however, all seven felt that others only might be willing to compromise, or others’ willingness to compromise depended on their policy actor affiliation. One citizen/environmental group member in the Wadley Farms conflict, for example, stated, “at this point the oil and gas industry has no incentive to compromise.” Later the interviewee added, “In my experience, the oil and gas companies are not willing in any way,

shape, or form to compromise, or come to the table to compromise.” A Boulder County former member of the local government echoed this sentiment: “I think that, industry has by and large shown no interest in any compromise since the adoption of air quality regs back in 2014.”

Another Boulder County citizen group member, however, disagreed on industry’s willingness to compromise: “they will compromise. I mean, basically what they’re trying to do is get the easiest regulations so they can come in and, and extract, extract fossil fuels and make, make profits.”

This same interviewee also said that, “The commissioners are definitely compromisers. I mean, they are, they are, you know, they say that their hands are tied, and they are working within the system that is, a system that is fixed against local communities. And so, the way they compromise is by trying to create the, the strongest regulations they can. But to us that’s unacceptable.”

Four interviewees across both conflicts, expressed less enthusiasm for compromise, both in their personal willingness and in the perceived wiliness of others to compromise. Two interviewees either commented that their personal willingness to compromise was contingent upon other things, such as a compromise from industry, or the protection of public health, safety, and the environment.

Two other interviewees expressed less of a clear-cut commitment to compromising at a personal level. One Boulder County citizen/environmental group member, for example, stated, “I think we should always be able to compromise, but we need to be very aware that compromise has...historically been used as a delaying tactic by those who are...very, very attached to their profits.” The interviewee went on to say, “I would like to see us move as quickly as possible away from fracking to sustainable energy and anything, any compromise along [the]...course of that path, I would certainly entertain. But...compromise in a way that simply enables more

fracking would not be a compromise in my mind.” The journalist also stated that, “[compromise is] totally in the eye of the beholder.” The interviewee, doesn’t “hold out a lot of hopes” that “compromise can be reached” and wondered, “if you believe...that one of the best ways to minimize future damage to the planet system is to limit the amount of carbon dioxide that we burn, then that kind of takes over the debate. There’s no—what’s the compromise to that?”

Local government officials cited others’ lack of understanding regarding regulatory authority as a potential obstacle to compromise. Boulder county officials, for example, discussed how groups that were calling for a ban on hydraulic fracturing felt betrayed by their local government for not instituting a ban and for following the Supreme Court decision. One official said, “some people understand that [...] the county’s got to be, to operate within the rule of law, but a lot of people don’t.” A Wadley Farms county official echoed the sentiment: “Citizens just don’t seem to realize that while the county has land use authority, even if the commission denies a site, they can drill because of state regulations. And it’s not going to do any good bringing it in front of us because there’s nothing we can do. And that’s really unfortunate.” A local, Boulder County municipal-level, government official who also works with a more moderate citizen/environmental groups involved in the Wadley Farms conflict felt that, those “who are unwilling to compromise and just say no, are not helping”; they’re just being “divisive.” The interviewee went on to say, “You can’t just say it can’t happen anywhere.” While local government interviewees were generally more inclined towards compromise, if they were also affiliated with a citizen/environmental group, the group’s ultimate stance on hydraulic fracturing influenced whether they were personally supportive of compromise.

Evidence of behavioral characteristics

Political strategies or tactics

In the PCF, the cognitive characteristics influence policy actors' behavioral characteristics, which are the actions or strategies policy actors take to directly or indirectly influence the conflict. While tactics varied across policy action situations, there were notable differences in the tactics by organizational affiliation. Policy actors who were affiliated with more moderate citizen/environmental groups and who were generally willing to compromise, utilized different actions and strategies than other, more extreme groups. A Wadley Farms citizen/environmental group member of a moderate group commented that, "working collaboratively with the county government and the elected officials in Adams County is a key strategy, but also with the county staff." At the same time, they cited the importance of "having well thought out and reasonable comments and objectives and conditions." The interviewee felt that, "we're able to make a difference because of that, because of working collaboratively. [...] But then also not being...afraid to...hold, you know, people accountable and to task." The interviewee also mentioned that they use the media, too. "We have a media list that we send out news releases and we've gotten lots of coverage." Another Wadley Farms citizen/environmental group member of a moderate group said, "We were established make sure that citizens have a seat at the table, because for too long impacted individuals have had no voice in the oil and gas processes in Colorado."

More moderate group members believed that anti-fracking groups, or those that are more extreme, exercised strategies different from their own group. One Wadley Farms citizen/environmental group member, for example, thought that the strategy of the anti-fracking groups was to, "use the media to make an emotional appeal, a plea." Another Wadley Farms

citizen/environmental group member characterized anti-fracking groups' tactics as protest outside of county commissioners' homes, civil disobedience, and working for a ban on hydraulic fracturing. Thus, more moderate group members had the tendency to discount the actions and strategies of groups who were more extreme.

The two members of the more extreme environmental group interviewed, one of whom is also an elected municipal official, characterized their actions and strategies in terms of a fight against the "system." They argued that the system is set up so that the rights of the industry supersede the rights of the citizens. They maintained that this is not something that white, middle class, professional people—unlike those who are disadvantaged—are accustomed to. They have million-dollar homes and good jobs, and they expect that the system will continue to work for them as it always has and so they're willing to collaborate with the industry; but now they are facing hydraulic fracturing in their neighborhoods. These extreme group members also compared the fight against hydraulic fracturing to other social movements, such as civil rights, the abolition of slavery, and women's suffrage. For this reason, these more extreme group members support civil disobedience. They are not alone; a member of another extreme group who also has a position with a national group, for example said, "anything we can possibly think of to protect communities and families and elevate democracy again, restore democracy, is appropriate as long as it's nonviolent." Thus, the policy actors who feel that the issue is political and is an issue of democracy are more willing to support nonviolence civil disobedience against the oil and gas industry and are also more likely to support a ban on hydraulic fracturing.

Unlike other groups, local government interviewees tended to emphasize regulation, legislation, and rulemaking to influence the conflict. Some policy actors are even considering pursuing legal measures against the industry. One Boulder County local government official, for

example, stated that the county was “planning on bringing a lawsuit against the oil and gas industry to hold them liable to the costs associated with climate change.” The interviewee also mentioned that they identified a 16-point plan “of all the things that we’re doing to try to ensure greater protection for our citizens,” which included water quality testing, air monitoring, and hiring an oil and gas inspector who is independent of the COGCC. Similarly, a Wadley Farms local government member also mentioned that the county hired its own well inspector for the county’s protection.

Policy actors with different affiliations, unsurprisingly, took divergent actions and strategies to influence the conflict. The journalist interviewed for the Boulder County conflict had a relatively modest strategy. The interviewee, for example, stated, “I just try to inform people. I mean, I know it sounds kind of corny, but that’s it.” The interviewee used the example of where they try to “make it fairer for people who own their own mineral rights to have some control over how they’re developed. So, I go down there and I write about it.” Industry representatives also had different tactics but had similar strategies to each other. The industry representative interviewed for the Wadley Farms conflict, for example, said, “it’s to me, a door-door-, in the trenches [strategy]. It’s some public service type things. You can’t turn on TV without Noble or Halliburton or somebody talking about how safe we are. Or CRED, who is an organization that all of us as industry support, you know, Colorado Responsibility Energy Development group and they are trying to get the word out.” Similarly, the Boulder County industry representative expressed frustration with what the interviewee saw as “fallacies and a lot of fear mongering,” which “made people that...were not the laymen to the industry and not educated on process and rules and regs and safety and all...made them very fearful of anything happening in and around their neighborhood, whether they backed up to the, their property

backed up to the, proposed location and/or they were a mile away; they, they had fear instilled in them.” The interviewee said that those on the opposing side “try to attack” and they “try to demonize or smear people within our industry.”

Despite the divergent actions and strategies, and the perceptions of the other, all non-industry interviewees who explicitly mentioned the industry’s strategies agreed that the industry utilized money and power as a strategy to influence the conflict. One Wadley Farms citizen/environmental group member for example said, those in the industry “have a lot of money, they have a lot of lawyers. And they...try to...overwhelm elected officials at meetings by paying people to attend the meetings. They lobby hard. They make threats to the county....they...threaten lawsuits.” The interviewee also said that, “at the local site level their strategy is to communicate as little information as they can about what they’re doing. So, I think that’s, that’s part of the strategy. You know, because the more they communicate that means the more people that will attend the meetings, etc., etc.” Another Wadley Farms citizen/environmental group member said, that the industry’s strategy is “to just spend an unlimited amount of money on whatever they think is going to resonate.” According to the interviewee, the industry funds “citizen front groups,” which “then purport to be...impacted citizens.”

The journalist interviewed also talked about how the industry has “manipulated public opinion” through public relations campaigns and went so far as to call the industry “ruthless.” The journalist said that with the money that they have, the industry “pull[s] every lever of power.” The journalist went on to say that “the industry is an equal opportunity benefactor, so it’s not as if the Democrats are going to all of a sudden [...] be ready to forcefully regulate this industry.” Along these same lines, another environmental/citizen group member, who has a

formal position with a national-level group, said that the industry has “corrupted our legislative process” and that the government “is very much in the pocket of industry.” The interviewee went on to say that the industry is “one of the most invasive, intrusive, metastasized, ubiquitous, alien” industries and compared the conflict to “David versus Goliath” and “good versus evil.”

Similarly, a municipal-level Boulder County local government member (who belongs to a more extreme citizen/environmental group) said that the industry had “bought their way into political office” and that “everybody’s beholden to this industry in Colorado.” The interviewee said, for example, “If you have political aspirations in the Democratic Party, you don’t look away from that industry. If you’re a Republican, you love them!” Thus, while the strategies differed across policy actor affiliation, policy actors with divergent affiliations had the tendency to view the industry in a similar light.

Conclusion

This paper studied a subset of the PCF, specifically the cognitive and behavioral characteristics, in two different policy action situations in Colorado: Wadley Farms and Boulder County. The aim of this paper was to lend insight into the ways in which different policy actors across these two situations differ in terms of both their cognitive characteristics and how this affects their behavior, or actions and strategies that they take to influence the conflict.

An analysis of the data indicates that, often times, policy actors characterized their divergent policy positions in terms of different views. Citizen/environmental group members, for example, tended to view policy divergence in terms of well location e.g., oil and gas wells do not belong near neighborhoods, and relatedly, environmental and public health and safety concerns. Interviewees who belonged to more extreme environmental/citizen groups also framed the conflicts in terms of politics e.g., oil and gas development is a political issue in Colorado and

Democrats and Republicans are both to blame for the current state of affairs. Local government policy actors frequently viewed policy divergence in terms of regulatory authority e.g., local governments should have the authority to regulate oil and gas development considering their local land use authority, and in terms of environmental and public health and safety concerns. Industry framed the conflicts through an economic lens e.g., they believed that their industry made significant contributions, in terms of tax revenue and job creation, to the local economies in which they operate.

The cognitive characteristics that are part of the PCF e.g., divergence in policy position, degree of perceived threats from others' policy positions, and an unwillingness to compromise, varied across policy actor affiliation. All interviewees perceived divergent policy positions, which makes sense in that both policy action situations have been mired in conflict. According to the PCF, if there is no policy divergence, then there is no subsequent conflict. The majority of policy actors interviewed (9 out of 13 interviewed) felt personally threatened by others' policy positions. The perception of threats directly related to policy actors' willingness to compromise. The more threatened a policy actor feels, for example, the less likely they will be to seek compromise. While most interviewees were willing to compromise and thought others were willing to compromise on some level, only members of more extreme citizen/environmental groups stated a personal and steadfast unwillingness to compromise.

The behavioral characteristics, namely the actions and strategies policy actors take either directly or indirectly to influence a conflict, also differs based upon policy position and directly relates to the policy actors perceived threats and willingness to compromise. Moderate citizen/environmental group members were prone to collaborate with industry and other groups, while those who belonged to more extreme groups did not work with groups who did not call for

an outright ban on oil and gas development. The industry attempted to educate citizens on the real story behind oil and gas e.g., what safe operators they are, etc. and local government tended to emphasize regulation, legislation, and rulemaking as a way to influence the conflict.

This paper contributes to the knowledge of policy conflicts' characteristics, drawing insights from policy actors involved in Colorado's oil and gas development. It also offers a qualitative approach that enriches our understanding of policy conflicts and provides an alternative analysis to that of Weible and Heikkila (2020), the only other application (to the author's knowledge) to examine both the PCF's cognitive and behavioral characteristics. Weible and Heikkila (2020, 260) relied on an empirical analysis of survey data and specifically called for future research to model "concepts with different data sources" in order to develop a "shared conceptual understanding of such conflict." This paper aims to add to the research to further the understanding of policy conflicts' characteristics.

This paper, of course, has limitations. This paper, for example, only applied a subset of the PCF and does not examine the feedback effects, or outputs and outcomes of the conflict. The next step in this research is to perhaps empirically examine both the cognitive and behavioral characteristics. At the same time, future papers should analyze the feedback effects and compare and contrast how they relate in practice to both the cognitive and behavioral characteristics.

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Draft

Appendix A: Categorical concept definitions of the PCF (Adapted from Weible and Heikkila 2017)

Policy setting

Levels of action

Political system	Often the broadest scope for governing a territory and exercising generic authority across a range of policy issues. A political system can exist at the national or sub-national levels (in a federal system) of country
Policy subsystem	A subset of a political system focused on a policy-related issue over an extended period of time. The territory of a subsystem may be the same or a subset of a political system
Policy action situations	The diverse arenas within political systems and policy subsystems, which include formal and informal policy venues, where actors engage, debate, and attempt to address problems around policy issues

Attributes of levels The constitutive elements and their interactions that define and structure any of the three levels of action including, but not limited to, institutional, socioeconomic, and physical conditions

Policy actor attributes

Intrapersonal	Attributes of individual policy actors (e.g., deep core beliefs, knowledge, and risk/benefit perceptions, personal resources)
Interpersonal	Attributes of groups of policy actors (e.g., network relations, organizational relations, and collective resources)

Policy issue attributes

Morality	The degree to which an issue is perceived as involving fundamental values about what is right or wrong or the way society ought to be
Complexity	The degree of difficulty and ambiguity of understanding and responding to an issue

Event attributes

Proximity	The topical and geographic proximity of the event to the policy issue
Complexity	The difficulty in understanding and responding to the event based its causality, the breadth and to the size of the event, and the temporality

Characteristics of policy conflicts

Cognitive characteristics of policy conflict

Divergence in policy positions	The degree to which actors express differences on the formation, adoption, or implementation of public policies
Degree of perceived threats from policy positions of others	The degree to which actors believe that the policy positions of others will impose costs, harm, or other negative consequences to themselves or society
Unwillingness to compromise	The degree to which policy actors are willing to change their views on a policy position

Behavioral characteristics of policy conflict

Political strategies or tactics	Efforts by individuals to directly (e.g., lobbying, voting) or indirectly (e.g., narrative debates, forming coalitions, organizing protests) influence outputs and outcomes and how those efforts are conducted
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Feedback effects of policy conflicts

Outputs	Changes or deliberate continuations of public policies, institutions of policy action situations, or actors holding elected positions of a political system, a policy subsystem, or policy action situations
Outcomes	Effects from outputs and policy conflict characteristics on a policy setting

Appendix B: Interview questions and how they relate to PCF (PCF characteristics in bold)

Questions

1. How did the conflict involving [the issue] come about? How did you get involved?
Background on policy action situation and policy actor attributes
2. What are the main points of disagreement and who is taking these positions?
Divergence in policy positions (cognitive characteristic)
 - a. Did/do you feel threatened by the positions that other people hold on this issue? If so, how and in what ways?
Degree of perceived threats from policy positions (cognitive characteristic)
 - b. Do you think other people feel threatened by the positions others are taking on this issue? If so, how and in what ways?
Degree of perceived threats from policy positions (cognitive characteristic)
 - c. Were/are you willing to compromise on this issue? If so, how and in what ways?
Unwillingness to compromise on policy positions (cognitive characteristic)
 - d. Do you think other individuals or groups involved in this issue are willing to compromise?
Unwillingness to compromise on policy positions (cognitive characteristic)
3. What actions or strategies are you taking to influence [the issue] over time?
Political strategies or tactics (behavioral characteristic)
4. What are other people doing?
Political strategies or tactics (behavioral characteristic)
 - a. (If they don't come up with examples... prompts could include a couple examples like: talking with communities, forming a coalition, going to the media or COGCC, etc.)
 - b. Also probe on the degree to which they are in communication with other people who share (or don't share) their positions and networking with other groups if they don't discuss this in their answer.
5. How did this conflict evolve over time?
Outputs (feedback effects of policy conflicts)
 - a. i.e. probes could include, who got involved when, any related issues that emerged, how people interacted, what influenced any outcomes...
6. What have the outcomes of [the issue] been?
Outcomes (feedback effects of policy conflicts)
7. Are you satisfied with these outcomes?
Outcomes (feedback effects of policy conflicts)

Appendix C: Timeline of Boulder County oil and gas moratorium

- February 2, 2012. Board of County Commissioners (Board) adopts Resolution 2012-16. Imposes moratorium on oil and gas development. Set to expire August 2, 2012
- May 1, 2012. Board adopts Resolution 2012-46. Extends moratorium for six months. Set to expire February 4, 2013.
- February 5, 2013. Board adopts Resolution 2013-18. Extends moratorium for four months. Set to expire June 10, 2013
- June 11, 2013. Board adopts Resolution 2013-55. Extends moratorium for additional 18 additional months. Set to expire January 1, 2015.
- November 25, 2014. Board adopts Resolution 2014-88. Extends moratorium for additional three-and-a-half years. (Board describes as “temporary.”) Set to expire July 1, 2018.
- May 2, 2016 the Colorado Supreme Court issues opinions in *City of Longmont* and *City of Fort Collins* declaring that Longmont’s ban and Fort Collins’ five-year moratorium violated state.
- May 19, 2016. Board rescinds moratorium in place and adopts new moratorium, Resolution 2016-65. Set to expire November 18, 2016.
- November 17, 2016. Board adopts Resolution 2016-130. Extends moratorium for more than two months. Set to expire January 1, 2017.
- December 13, 2016. Board adopts Resolution 2016-137. Extends moratorium for four months. Set to expire May 1, 2017.

See *State of Colorado v. County of Boulder Colorado* (2017).

