Cultural Theory of Risk as a Heuristic for Understanding Perceptions of Oil and Gas Development in Eastern Montana, USA

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Abstract

This paper applies Douglas' cultural theory of risk to understand perceptions of risk associated with oil and gas development in eastern Montana. Based on the analysis of interviews with 36 rural residents, findings show the dominant perception of risk is most closely aligned with an Individualist worldview. Despite direct experience with oil or wastewater spills, most interviewees described spills as "no big deal", viewed nature as resilient, and felt that the economic benefits outweigh negative impacts. Cultural theory was a useful heuristic for understanding this dominant worldview, as well as identifying points of deviation. For example, interviewees discussed the benefits of landowner associations – a more Egalitarian approach to dealing with oil companies. Some landowners relied on external authorities (e.g., sheriff) when dealing with oil companies, revealing a Hierarchical approach to issues they face. Interviewees expressed frustration with the lack of enforcement of existing regulations, which can be interpreted as either support for - or indictment of - Hierarchical solutions. While the Individualist worldview is dominant, our qualitative analysis reveals the complex tensions at work among rural residents. The results suggest areas where policymakers, advocacy groups, and residents may find common ground to address potential environmental and health risks.

Keywords

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1. Introduction

Oil and gas development poses potential risks to environmental and human health —
especially when spills occur (Adgate et al., 2014; Colborn et al., 2011; Vengosh et al., 2014).
Yet, perception of risk varies among individuals and communities (Boudet et al., 2014).
While several studies have carefully catalogued the positive and negative impacts of oil and
gas development (Jaquet, 2014, Ellis et al. 2016), fewer studies have sought to understand
the socio-cultural factors that *underpin* differences in risk perception (c.f., Malin, 2014;
Fernando and Cooley, 2016; Veenstra et al., 2016; Willow, 2014). This paper applies the
cultural theory of risk and the associated grid-group typology (Douglas and Wildasky, 1982;
Schwarz and Thompson, 1990) to understand the perceptions of 36 residents in six oil-rich
counties in eastern Montana (MT). We are particularly interested in identifying and
understanding the dominant cultural worldview of eastern Montanans and how this relates to
views of nature and perceptions of oil and gas development. For this, we turn to Douglas'
cultural theory of risk.

2. Literature Review: Cultural Theory of Risk

Mary Douglas and her colleagues developed the cultural theory of risk in the early 1980s as
an alternative to the dominant technical, rational, and psychological approaches used to
assess risk perception (Douglas and Wildasky, 1982; c.f., Slovic, 1987; Starr, 1969; Tansey
and O'Riordan, 1999). Cultural theory views perception of risk as a social process whereby
some risks are recognized while others are suppressed depending on one's values and
preferred form of social order (i.e., worldview). As Wildasky and Dake (1990) explain,
"individuals choose what to fear (and how much to fear it), in order to support their way of
life[1]" (p. 43). According to Douglas (1992), risk is a social construct where individuals
assess the same dangers but come to different opinions of risk based on underlying cultural
biases associated with their way of life. Cultural theory of risk is, by definition, focused on
collective, social, and shared conventions that influence individual perceptions. Cultural
theory posits that risk perception is a "culturally standardized response" (Douglas, 1992, p.
40). In short, socio-cultural context is the primary explanation for different perceptions of
risk.

While "risk" can be defined as "the probability of an event combined with the magnitude of
the losses and gains that it will entail" (Douglas, 1992, p.40), Douglas notes that "acceptable
risk*"*(i.e., socially desirable notions of safety) is always a political question and never a
probability. Cultural theorists assert that there is no set mechanism or formula for
determining the level of *acceptable* risk in a society. Acceptable risks are determined based
on a particular rationality and notions of what is reasonable (Douglas, 1992). To aid in
cultural analysis and make sense of competing preferences and aversions to different risks, a
typology is used which classifies risk perceptions into four distinct ways of life or
worldviews. Each worldview is differentiated by grid, which is the degree to which social
interactions should be constrained by rules and norms, and group, which indicates the degree

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[1]For cultural theorists, a 'way of life' is a set of values and ideas about social order, as described in Figure 1. Ways of life are also
called worldviews, cultural types, and/or political cultures in the literature.

to which people are incorporated or bonded into social groups. Another way of summarizing these positions is to think of the group axis as answering the question "who am I?" (or "who am I with?") and the grid axis as answering the question "how should I behave?" (Schwarz and Thompson, 1990, p. 6; Tansey and O'Riordan, 1999; Wildavsky, 1987). The resulting quadrants describe four cultural ways of life or worldviews regarding risk: 1) Fatalists (Low Group, High Grid); 2) Individualists (Low Group; Low Grid); 3) Hierarchists (High Group; High Grid); and 4) Egalitarians (High Group; Low Grid).

Using this grid-group typology, Schwarz and Thompson (1990) overlaid four contradictory views of nature to highlight how the worldviews used in cultural theory fit with different perceptions of the resiliency or fragility of the natural world. Their typology suggests different management options to deal with the different cultures of risk perception in regards to environmental hazards (Figure 1).

For example, Individualists prioritize individual freedom and responsibility (Low Group) over associations and alliances. In terms of behaviors, they favor market-based solutions and self-policing over top-down regulations (Low Grid). As this example demonstrates, cultural preferences shape understanding as well as the appropriate institutional arrangements and policies. According to Schwarz and Thompson (1990), the Individualist worldview corresponds with a perspective of nature that is benign and robust, therefore able to tolerate and absorb the negative impacts from society. People who are aligned with the individualist view are likely to be dismissive of environmental and technological risks because restrictions to personal freedoms would needlessly impede the beneficial extraction and use of natural resources. Thus, faith in nature's resiliency is a necessary precondition for this worldview's coherence.

Egalitarians are also Low Grid, meaning they resist externally imposed controls and restrictions on choice; they favor small-scale organizations and fear that external, hierarchical intrusions will bring about social differentiation, which conflicts with their goal of fostering egalitarian social relations. In stark contrast to Individualists, Egalitarians are more closely bonded and prioritize collectivism, cooperation, and communal forms of organizing (High Group). They want the rules to apply to everyone equally. They view nature as ephemeral and highly fragile, which means even small disturbances to nature's balance should be prevented, as they may result in catastrophic outcomes (Schwarz and Thompson, 1990). Egalitarians promote this precautionary principle and strive to protect the most vulnerable members of society from environmental and technological risks.

Hierarchists prefer highly structured organizations with clear rules and well-defined, ranked roles that lead to social differentiation; like a military organization, they are willing to defer to institutionalized authority and bureaucratic government (High Grid). Social bonds and responsibilities are strong among them (High Group). They view nature as "perverse/tolerant" (Schwarz and Thompson, 1990, p. 10). This particular phrasing emphasizes that their view of nature is resilient, *but only within limits* (Schwarz and Thompson, 1990). Therefore, Hierarchists see a need for strict regulations and monitoring to avoid reaching a tipping point that would disrupt a perceived "balance" in nature. Environmental and technological risks are best assessed and managed by experts.

Lastly, the Fatalists are the marginal members of society with weak social ties (Low Group), yet experience many social forces outside of their control (High Grid). Slaves in the antebellum South provide one example of fatalists (Ellis and Wildavsky, 1990). Schwarz and Thompson (1990) use the example of a chronically unemployed person, who wanders from "one welfare centre to another *ad infinitum*" (pg. 8). Unable to influence events in their life, fatalists are unlikely to participate in political life and simply "endure" whatever comes their way. This fits with a view that nature is capricious and therefore cannot be managed.

It is notable that, for Douglas, no individual, firm, or community sits entirely within one cultural worldview or the other, rather each is more or less Hierarchical, Individualist, Egalitarian, or Fatalistic to varying degrees (Douglas, 1992). Indeed, several authors suggest that the grid-group typology should only be used as a heuristic – a tool for thinking about social phenomenon (Malsch, 2012; Tansey, 2004; West, et al., 2010). Tansey (2004) argues that recent attempts to quantify cultural theory have converted what is a theory of institutional forms into "a psychological theory of risk perception" which is applied to the individual, rather than to a society (p. 27). We use the grid-group typologies as a guide to analyze perceptions of oil and gas development and understand why many eastern Montanans view oil and gas development as an acceptable risk.

1. Case Study

Eastern Montana is 'Big Sky Country,' known for its wide-open landscapes and the western sensibilities that embody the pioneer spirit: independence and grit. This stark and isolated landscape largely depends on the Missouri and Yellowstone River Basins to provide the necessary moisture to sustain its rural agricultural economies (Wyckoff, 2006). Although most of the region has experienced a decline in population over the past eighty years, a smaller subregion nested in the far eastern section of Montana has managed to maintain a more robust economy (Economic Profile System, 2017; Wyckoff, 2002). With a population exceeding 40,000 in an area just larger than Massachusetts, the six county area of Sheridan, Roosevelt, Richland, Dawson, Wibaux, and Fallon (Figure 2) complements its production of high value grain commodities and livestock ranching with oil and gas extraction (Economic Profile System, 2017; Smith and Haggerty, forthcoming 2018; U.S. Army Corps, 2016). In fact, these six counties, which comprise our study area[2], collectively produced over 88 percent of the state's oil in 2015 (Flowers, 2016).

The region first experienced an oil boom in the 1950s and quickly became Montana's most important oil producing region with the discovery of the energy rich Williston Basin (Malone et al., 1991). Although North Dakota has functioned as the epicenter of the recent "Bakken boom," the Elm Coulee oil field in Richland County currently produces roughly half of Montana's oil. The potential exists for additional development in Richland as well as Sheridan and Roosevelt Counties (Richmond, 2012). The other three counties in our study— Dawson, Wibaux, and Fallon—certainly felt the impacts of the once frenzied Bakken development, but their oil production comes primarily from an older play known as the Red

River formation (Eastern Montana Impact Coalition, 2015). In this region land ownership resides largely with rural landowners and farmers, therefore these individuals are directly subjected to the impacts from new infrastructure including new wells and pipelines (Smith and Haggerty, forthcoming 2018).

Spills related to oil extraction have affected both individuals and communities. When a 2015 Bridger Pipeline break leaked more than 30,000 gallons into the Yellowstone River, the city of Glendive's water supply became contaminated with benzene, a known carcinogen. At one point benzene levels reached three times the legal limit (Hudson, 2017). Although major pipeline spills are covered extensively by the media, many smaller spills occur frequently across the region, as registered in the Montana Board of Oil and Gas (MT BOG) database of spills. Because the area increasingly uses hydraulic fracturing technology to recover much of its oil, a higher risk exists for wastewater surface spills and blowouts (Lund et al., 2015).

4. Methods

We used archival and snowball sampling methods to identify landowners whose properties had been directly impacted by an accidental spill of industrial materials, typically crude oil or saltwater. We used the MT BOG online database, which maintains an inventory of spills related to oil and gas activity throughout the state. From the BOG database, we extracted a list of all of the spills from January to October of 2015. This list included information on 140 spills, most of which occurred in six counties in eastern MT (Figure 2). The size of the spills ranged from a few gallons to hundreds of barrels. In addition to the volume of the spill, each entry indicated the type of materials involved, the landowner, and the reporting entity (often the party responsible for causing and cleaning up the site). We further organized our list geographically with the goal of interviewing approximately the same number of landowners in each county. Additionally, we identified landowners who had direct experience with the 2011 pipeline break that involved the Yellowstone River. We were also directed by several interviewees to talk with two landowners who live near a new solid waste disposal facility (WORC, 2015). Interviews were conducted over a three-month period (January–March) in 2016, which coincided with the decline of the most recent oil and gas boom in the region. The results described here are based on the analysis of 24 recorded interviews with 36 interviewees (in some cases a spouse or neighbor was also present and contributed to the interview). Thirty-two interviewees were landowners who experienced oil and/or wastewater spills on their property, three were public officials from the town most impacted by oil and gas development, and one was a public official from the town impacted by the 2011 oil spill in the Yellowstone River. Interviews were conducted at the interviewee's home (or office) and/or at the site of the spill. Most interviews lasted about one hour. As each interview became more redundant, with fewer contributions to understanding the breadth or depth of experiences, the research team determined saturation point had been reached (Cameron, 2005).

The interview protocol was organized around the key dimensions of the grid-group typology to elicit responses about views on nature's resiliency/fragility, including regulatory preferences (grid axis), and sense of community/individualism (group axis). Interviews were recorded (with permission) and later transcribed and coded using Nvivo 11. The research

team developed thematic codes using the cultural theory of risk and the grid-group typology as a conceptual framework (Schwarz and Thompson, 1990). Two rounds of coding were conducted by two different researchers.

5. Results

Our analysis reveals the dominant worldview of eastern Montanans, as well as their complexities and contradictions, when assessing the risks of oil and gas development. While we found some examples of narratives that fit nicely within a single grid-group quadrant, more commonly, we found a great deal of contradiction in people's perceptions of oil and gas. Douglas does not claim that this typology will identify pure types, but that it can reveal ways in which the individual is embedded in a cohesive cultural community based on perceptions of risk, responsibility, and competence. Using cultural theory of risk as a heuristic device to organize emergent narratives about the environment, community, and individual rights, our analysis reveals the complex set of tensions at work among these community members who are struggling to maintain their rural way of life and protect and provide for their families.

5.1 Dominant Narrative: Spills are "no big deal", nature is resilient, and economic benefits outweigh negative impacts

Our interviews in eastern Montana reveal that the people who are exposed to the most acute risks associated with oil and gas development – spills – are most closely aligned with an Individualist's worldview. In talking with landowners who had experienced a spill on their property, we found that spills were generally viewed as "no big deal." In fact, crude oil was often viewed as "fertilizer." As one landowner said:

> "Everybody talks about a barrel of oil or a barrel of water. Well, in my book, a barrel of oil is nothin'. If you spread 10 barrels of oil out across my land, by next spring, the grass is going to be that much taller."

This low-risk view of spills prevailed among most interviewees. In keeping with Schwarz and Thompson's (1990) adaptation of cultural theory, this low risk perception among our interviewees tended to correlate with the dominant view that nature is resilient:

> "[The land] is very resilient. You can do a lot to the land, and it'll come back … It'll kinda take care of itself – regrow and cover up all the mistakes that they made years and years ago."

Of the 24 analyzed interviews, only one interviewee described a "fragile" nature in a manner more consistent with an Egalitarian point-of-view. This description stood in stark contrast to the way others described nature:

> What worries me a lot is that people don't seem to think it's a big deal… Any kind of pollution anywhere in the world impacts everybody who lives on the planet. Not as directly for sure, but everything, *everything*, that happens has an impact. Much larger than the initial impact at this site.

Also in keeping with the Individualist worldview, most interviewees believed that, overall, the economic benefits of oil and gas development outweigh negative community or

environmental impacts. However, this was rarely a straightforward conclusion since most people held mixed views about the industry. One of the biggest concerns expressed by interviewees was apprehension about how their community had changed. When asked if he thought the community was better off as a result of oil and gas development, one person opined:

> No [it isn't]. Everything's went up. I mean the fuel costs. There's no reason they should have been that high. What they charge for fuel and gas here -- and groceries have tripled!…[And] a lot of these teachers…they can't afford to live here. I mean they're talking $1,700, $2,000 dollars a month for an apartment…then the groceries on top of it. It just doesn't make sense.

As another person described:

> Nobody locked the door before the [local school teacher was murdered]… Now it's just a whole different community. I mean for us to talk about traffic… You shouldn't have to think about how you're going to get across town.

Some interviewees mentioned concerns about negative impacts on human health, groundwater, and wildlife, however this was not a widespread or pressing concern. As one interviewee said:

> You do worry about health, I do. I breathe that in, I smell propane. I have no idea what the air quality is. We have a lot more sinus health, allergy issues, our eyes, all kinds of stuff we didn't have before. Can't prove what it's related to. And coincidence, could be, we're getting older.

City officials were concerned about water quality and public health due to irregular trailers and campsites that popped up overnight:

> The campers and the transient housing were the biggest problems on water quality that you worried about, because there were literally tens of thousands…you would go from here…30 miles out in the hills and you'd see a power pole for a stock well and there might not be a house for five miles and there would be three campers parked around it because there was power there.

We asked what these campers were doing with their wastewater and the city official said:

> Dumpin' it on the ground. Most of the RVs, I mean most of 'em were just dumping it on the ground.

Despite recognized risks, complaints, and concerns, the Individualist culture in eastern Montana is supportive of continued oil and gas development in the region. After a long conversation about the pros and cons of oil development, we asked people to weigh the balance. The majority of interviews (n= 19) concluded that, on balance, the economic benefits of the industry far outweigh the negative impacts. Even the family that had experienced one of Montana's largest saltwater spills appreciated oil and gas development:

> Yeah [the recent oil and gas boom] helped us considerably… We put up a shop when the [auto body] shop burned down in '99. Built that first shop there next to the house. And then in 2012, we built the big shop. We outgrew the little one so fast

- and a lot of trucks wouldn't fit in that shop, so we built the real big shop and was able to pay for it and not borrow a dime. So yeah the oil boom really helped.

Another landowner described the difference oil and gas had made in one generation:

My mom and dad lived pretty poorly. We didn't' own anything new… When the oil field came and they started drilling… it made [my dad's] life a lot easier. And mine too.

Others noted the potential benefits of development for the broader community:

Some of the big companies that move in here will be likely to donate to different fundraising things that go on in a small town.

Two interviewees noted that their biggest concern would be the lack of oil and gas activity:

If you ask anybody in this community what's stressful in their life, it's the price of oil. Everybody's worried about their job.

Even the two landowners most affected by a new waste disposal facility weren't "anti-oil and gas." Despite being frustrated with the lack of transparency and accountability in the permitting and monitoring of the waste facility, both landowners acknowledged the financial benefits of the industry and the energy it produces. For example, after proudly describing the five solar panels he had on his property, one said:

I like oil too and I use a lot of it. We use it farming, ranching. And we're not going to get away from it for probably another generation, even if we wanted to – or two or three. And the domestic production, I'm not all against it either. Having some domestic supply, just in lieu of - depending on the rest of the crazy world - is a smart thing. But at the same time, aren't we smart enough to do the best job with it in the world?

The other nearby landowner made a similar statement:

Myself and my family, we don't feel like we're anti oil and gas. We have friends and family that are in the oil industry. We probably use more diesel fuel than everybody in this room combined for farm and ranching. So I respect it. We have to have it.

When asked if, overall, oil and gas benefits the community, this landowner said, "Absolutely, it's beneficial. It *is* beneficial." They are not blind to the negative impacts of oil and gas; however, they recognize that fossil fuels are simply part of everyday life.

In contrast to the majority, five people reported that the benefits did *not* outweigh the negative impacts. Among these more concerned individuals were city officials in the town most directly impacted by increased truck traffic and unplanned growth—not individual landowners. When asked if it was worth having an oil boom every once in a while, one official scoffed, "Oh I'd give it to any community. They can have it." Another city official replied:

You have to be very savvy. There's as much money lost on every down turn. There's probably twice as much money lost as there ever is made. And everybody

from elsewhere, you know, thinks that everybody here is rich… Oil wells are just a pain. They're an environmental hazard and a traffic hazard.

5.2 Individual as Negotiator: By Choice or By Necessity?

Following cultural theory, the dominant views expressed above indicate an Individualist worldview: low perception of risk, economic benefits are highly valued, and a belief that nature is resilient. One of the values ascribed to the Individualist worldview is favoring markets and market transactions as the optimal way to organize society and manage risk. According to Schwarz and Thompson (1990), the "freedom to bid and bargain" is highly valued among Individualists (p. 6). From this worldview, the most efficient way to control externalities is through contracts and bargaining between the two affected parties (e.g., between landowners and oil companies) (Coase, 1960; Robbins et al., 2014). In our interviews, it was very clear that individuals played an important role as negotiators. Some people saw their leases as a way to regulate oil companies themselves:

> Well there's always talk about changing rules or laws around the state to limit oil companies to do certain things, but you could put that in your lease… like this set back rule we're dealing with… if it's a 3,000 barrel a day well [it] probably wouldn't hurt so bad having it right next to your shelterbelt. But if it's a 20 barrel a day or 20 barrel a week, then it'd be better if it was a half-mile away. Especially if it had stinky gas.

This seems like a straightforward, Individualist solution for regulating oil and gas without the interference of government officials. After listening to several stories about what happens after a spill occurred, it became clear that the degree to which an individual made demands and was an effective negotiator made a difference in terms of what steps were taken to remediate the site and what level of compensation was awarded. One interviewee mentioned getting paid $15 per rod of pipeline that crossed her property. We asked how she knew what price to ask for and she explained:

> You're always talking with your neighbors and different people … and you got to be in contact with them. Some neighbors ask more and the oil companies know if they pay it then they're going to have to pay you too.

However, when asked if she felt like there was community support for dealing with these questions, she responded:

> No. You're on your own. You're definitely on your own because, you know, certain people - like this place I rent - they're only after the money. I've heard people don't even charge them for the pipeline just to get them, you know, to keep drilling.

Another interviewee had learned to ask for annual leases, rather than a one-time payment:

> I really *really,* always *always* push an annual rental … because then that annual rental always stays with that surface rights agreement. So, if I go to sell the property, I can tell my landowner that I'm selling it to, "yeah, that well up there, there are no minerals but I get $2,000 or $3,000 a year, you know, for our rental for that." And you know, they're like, "Oh, okay. That's worth something to have that there."…But the landowner gets absolutely nothing for those spots if you haven't

negotiated some type of annual rental with 'em…cause most of the oil companies…I mean their philosophy - they want to pay that guy up front and be done with it.

We followed up by asking where he learned to negotiate for annual payment. He said, "Aah, just from seeing, you know, what I have."

But in our conversations, it sounded like being a negotiator was a burden and source of stress – especially for already busy farmers. One landowner described his experiences with the oil company to try to get a well moved to a different part of his property:

[The oil company] said they wouldn't move it, but we negotiated. That's the whole thing. You have to know the legals, you have to study it, you have to figure out who they are and how they operate. You have to be a geologist. And you have to be a negotiator. You have to know oil and gas, you have to know everything. And we're just farmers! We just really want to farm and raise cattle – and you can't be that! You really, really can't be that. Or you're going to lose something.

To try to reduce the burden on individual landowners, a more Egalitarian solution was implemented at the local level. We found that many interviewees participated in (or at least acknowledged the importance of) a community resource organization known as Northeast Montana Land & Minerals Owners Association[3]. Here, one member described what the organization does:

They formed probably 40 years ago, probably 3 oil booms ago, and their mission, I believe, is to help land owners and mineral owners deal with oil companies on leases. It was a way for landowners as a group to get together and try to get legislation done, to help people work together to come up with solutions to problems, and get better leases and educate…We invite the Board of Oil and Gas to speak usually once or twice a year…It's just the way to work together. Let's say an area is going to be a hot zone for oil development, well, now everybody can work together for damages for leases. It's a win-win.

His wife added:

Or if there's problems, the group might have a committee that will go to the Board of Oil and Gas or legislatures or something and say, "You know there's a big issue going on out here. And we really need to try to solve it." And when you've got a group behind you and they have a little bit of clout, they'll listen a little better and it's easy… easier [than] a single landowner who maybe doesn't know anything or maybe is shy - I mean doesn't want to get out there and fight for themselves, but they know they need to.

The Individualist view expressed by interviewees in eastern Montana demonstrates that they do not believe that their productive landscapes have been irrevocably harmed; nor do they seek damages that are multiparty or joint. Instead, they view individually negotiated

[3]Interestingly, when we asked about another landowner group - Northern Plains Resource Council – several people said it was "too environmental."

transactions as the accepted solution to injury. They also accept that damages incurred are monetizable. However, their cultural preference places the *individual* in the position to negotiate compensation from the offending person or organization.

5.3 Individual as Enforcer: "You have to be your own watchdog and sheriff"

In addition to having to negotiate complex legal landscapes, many interviewees told us stories about how they stumbled upon a leak or something that wasn't right – and they were the ones who had to be the "watchdog" and report it to the company and/or to a state authority, such as the Montana Department of Environmental Quality (DEQ), Department of Natural Resources and Conservation (DNRC), or the Board of Oil and Gas (BOG). As one person told us:

> If I don't get angry about it or insist that it be done…then some of them will try to break the rules. That's why citizens have to be educated. That's why I'm a member of the Northeast Montana Land and Mineral Owners Associations.

As another interviewee told us:

> I caught an oil company pumping out of one of our wells and dumping it and so I called the DNRC… I said, 'well I caught them.' The law says they're not supposed to do that. Well they did stop the next day. But the only reason they did is because I caught them.

Another landowner was having a disagreement with an oil company about whether they had a lease on the land to put a new well site. She said:

> Because I had gone to the Oil and Gas Meetings, I knew that I had the right to recieve written notice at least so many days in advance… this company wanted to come in [right away] and I told them they couldn't. I told them 'If you're there on Thursday morning, the sheriff will be there'…I said, 'I [will] have the sheriff there and all your equipment will be impounded and I will press charges as far as I can'.

While the ablity (or obligation) for individuals to enforce rules fits with the Individualist worldview, the latter two cases exemplify how landowners invoked the threat of external authorities (e.g., DEQ or sheriff) – expressing sentiments more in line with the Hierarchical worldview. Yet, they are not endorsing a technocratic approach where decsions are made by an outside expert authority, but they are willing to use such authorities as leverage in their neogiation with oil and gas companies.

5.4 Acting as Negotiator and Enforcer is Stressful

When asked to describe the level of stress (on a scale of one to ten) caused by the spill or oil and gas in general, one indivudal laughed:

> One. Ha. [The oil spill] goes away pretty fast, and [the companies] are actually quite good about trying to get along with the landowners.

About one-third of the people we spoke with expressed similiarly low levels of stress. Another one-third of the people we spoke with expressed moderate levels of stress. But there was also one-third of interviewees who felt very high levels of stress:

> I ran a business down in [another state] for 15 years. I built homes and stuff down there and it's high stress, high volume – and I felt *more* stress with this [oil spill] than I ever did down there dealing with people day in and day out.

In many cases, the stress stemmed from having to act as a negotiator or enforcer. One landowner described his experience getting compensated. He ranked his stress level as an eight on a scale of ten:

> I'm talking pipelines, the seismographing, we had them come through here with those [thumpers]… They want to do it immediately. They went across here with the thumpers, but they were only going to do it at night because it was spring and it was thawing… They got stuck and they pulled each other out. I mean, there was ruts six feet deep! And they just left them! I mean, they were here, and then they were gone. But I finally fought *and fought* and got a lawyer. And they paid me.

In several cases, the experience of stress was gendered, with wives reporting greater levels of stress than their husbands, such as the following exchange:

> Interviewer: If you think about the most stressful episode of your life, how does this oil spill compare to that? Where would you put this on a 1 to 10 scale?
>
> Wife: Maybe a 4 or a 5. We've had a pretty stressful life.
>
> Husband: I would put it as a 1.
>
> Wife: No. For you maybe. Because you weren't on the phone and on email all day and all night for weeks. It was very stressful for me. I was getting emails from people I know all over the world and from people wanting to do radio interviews and people wanting to come by the site with television crews… it was a constant barrage of phone calls and emails and I really didn't know that much.

5.5 Anti-Regulatory or Frustrated with Regulators?

Dislike for externally imposed restrictions (i.e., state or federal regulations) is another hallmark characteristic of Individualists. Therefore, we would expect to find strong anti-regulatory views. And this view did exist among some interviewees:

> Some of those regulations go way over. If people would start using common sense again and be responsible for their actions, they wouldn't need as many regulations. I mean you wouldn't tell your kid, 'Oh look there's a fire, go see if it's hot – stick your hand in it.' And that's the type of common sense they don't have out there on oil well sites. They don't think before they do something.

But more commonly we found that interviewees expressed a high level of frustration with what they viewed as ineffective government agencies and unenforced regulations, with statements such as:

> Regulations, you know – I know what kind of word that is for a lot of people – but you could make a good case that the lack of oversight or regulations is what caused a lot of the issues that we've had lately.

Or:

> Enforcement would really make a big difference. There's really some awfully good regulations, nothing is perfect… We can improve them, I'm sure, but there's a lot of fairly decent regulations in place. Nobody enforces them and I think, from what I've been told and hear and see, [it's] mostly because it's oil and gas and they're powerful.

In general, interviewees were not seeking an expansion of government to prevent risks, but there was a strong feeling among several interviewees that current rules were not well enforced. While this could be interpreted as support for hierarchical solutions (i.e., regulations), it can also be interpreted as an indictment of this approach to environmental management.

6. Conclusions and Discussion

Given the national and international concern about the environmental and health risks of oil spills – especially in the case of spills, we set out to use cultural theory of risk to understand the dominant worldview of residents in six oil-producing counties in eastern Montana. Based on the analysis of 24 interviews with 36 people, we found that the dominant discourse is that oil spills are "no big deal", nature is resilient, and the economic benefits outweigh the negative community or environmental impacts. These views most closely align with the Individualist worldview in the grid-group typology (Douglas and Wildasky, 1982; Schwarz and Thompson, 1990).

While much of the narrative about oil and gas development fits within the Individualist quadrant, it also deviates in important ways. For example, while some people touted the landowner's ability to self-regulate the industry by putting restrictions in their leases, there were many stories of frustration by landowners who were forced to act as negotiator and enforcer. While preference for individual contracts and market transactions are indications of an Individualist worldview, we observed the stress associated with the uneven power struggles between community members and industry. In the face of these tensions and stresses, many people turned to a landowner group – an Egalitarian solution – that helps landowners negotiate fair leases and brings greater attention to the problems faced by rural Montanans. The shift from a low group to high group strategy suggests that there is some solidarity among residents. However, this local community response to the issue does not change the fundamental power structure that shapes relations between oil and gas companies, individuals, and officials in these communities. Furthermore, the coordinated approach does not signal that their cultural type has crossed over to Egalitarian. The cooperation with landowner groups may be considered a quid-pro-quo agreement between individuals as opposed to bonding together as equals to fight an unwanted outsider.

The furthest deviation from the Individualist worldview was when landowners who were acting as 'enforcers' invoked the threat of external authorities (sheriff, etc.), signifying the existence of a hierarchical solution to their problem. Interviewees' frustration with a lack of enforcement of existing rules can be interpreted as either support for – or indictment of – the Hierarchical worldview. It is important to note that reliance on external authority is not the first choice of the Individualist, who places a high value on individual freedoms. However,

while "Individualistic cultures prefer minimum authority, just enough to maintain rules for transactions, they do not reject all authority; if it leaves them alone, they will leave it alone" (Wildavsky, 1987, p. 11). This finding illuminates the frustration some Montanans have with not having the individual capability to deal with the risky situations they are exposed to, however it does not indicate an abandonment of their cultural preferences.

We found that it was useful to employ cultural theory's grid-group typology as a heuristic to analyze our findings. However, given the complex experiences and narratives of people and communities, we caution against methodological attempts to straightjacket individuals into a single quadrant (c.f., Dake, 1992; Kahan et al., 2007). Instead we outline the "culturally standardized response" (Douglas 1992, p.40) of eastern Montanans in the face of continued oil and gas development.

These findings suggest areas where policymakers, advocacy groups, and residents may find common ground to address potential environmental and health risks. While rural residents are unlikely to be compelled by arguments about the fragility of nature, they might be interested in programs that help landowners understand their rights and develop their negotiating skills. Improving the responsiveness of regulatory agencies to landowner concerns would likely build trust and perhaps show the value of regulations designed to protect environmental and human health.

The eastern Montana way of life (i.e., worldview) impacts people's perceptions and what is considered an appropriate response to the risks associated with oil and gas development. In this case, the Individualist worldview justifies oil and gas extraction as long as the people are compensated for damages. Given that there are numerous potential impacts of oil and gas development, these Individualists have a lot at stake, however they also view the land as a productive source of income. The working landscapes of Montana are not considered fragile or virgin. Their increased vulnerability may increase solidarity in the community; yet the worldview revealed here more closely reflects the cultural values of Individualism. They talk about oil and gas – particularly the negotiating and enforcing – as a stressor, and some have concerns regarding their own health or the environment. But while Individualists may acknowledge that oil and gas development in eastern Montana is risky, it is generally viewed as an *acceptable risk*, so much so that it is "no big deal." The use of cultural theory helps to illuminate this different context of calculation.

Acknowledgments

Abbreviations

BOG   Board of Oil and Gas

DEQ   Department of Environmental Quality

DNRC   Department of Natural Resources and Conservation

MT   Montana

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Highlights

- Cultural theory is used as a heuristic; worldviews and risk perceptions are complex

- Dominant view: spills are 'no big deal', nature is resilient, accidents are inevitable

- Economic benefits of oil and gas are generally seen as outweighing risks

- Land owner associations are seen as a way to deal with oil companies and stress

- Sometimes external authority is necessary to deal with energy development
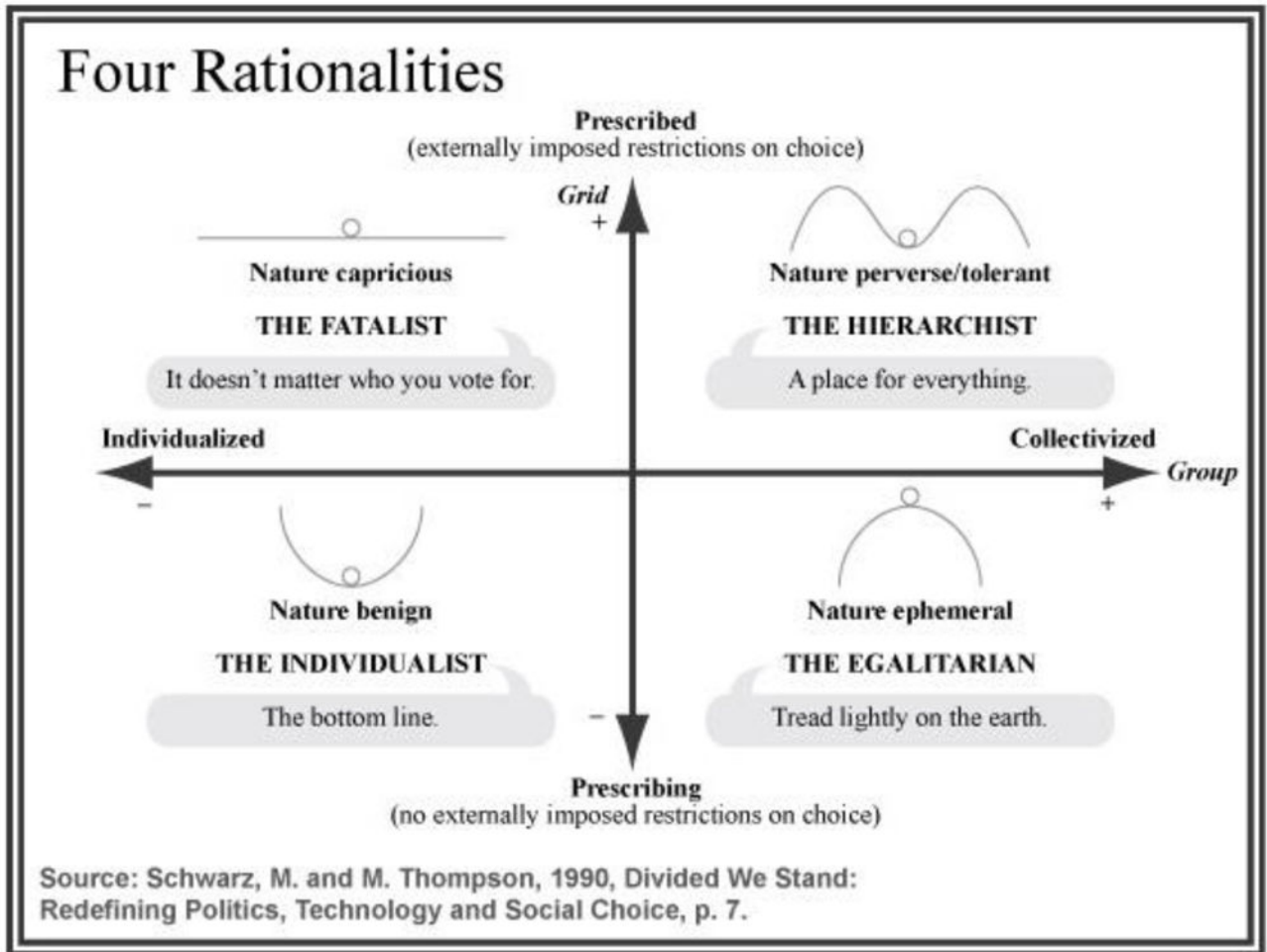
Four Rationalities

Prescribed
(externally imposed restrictions on choice)

Grid
+

Nature capricious

THE FATALIST

It doesn't matter who you vote for.

Nature perverse/tolerant

THE HIERARCHIST

A place for everything.

Individualized

Collectivized

Group
+

−

Nature benign

THE INDIVIDUALIST

The bottom line.

Nature ephemeral

THE EGALITARIAN

Tread lightly on the earth.

−

Prescribing
(no externally imposed restrictions on choice)

Source: Schwarz, M. and M. Thompson, 1990, Divided We Stand: Redefining Politics, Technology and Social Choice, p. 7.

Figure 1.
Schwarz and Thompson's (1990) diagram of Cultural Theory of Risk's Grid-Group Typology and Views of Nature (image from Silverman, 2010)
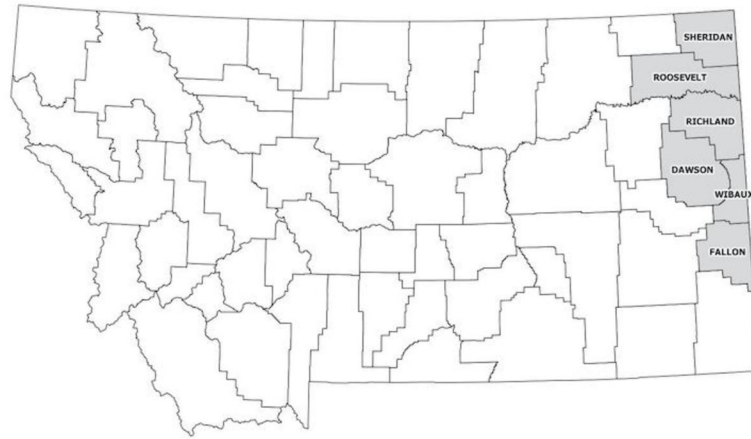
Figure 2.
Map of six oil-producing counties in Eastern Montana