

Landowner Response to a Rural Appalachian Natural Gas Pipeline Project

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ABSTRACT

Recent research identifies a number of factors associated with public support for or opposition to environmentally-contentious energy infrastructure projects. Much of that research documents the attitudes of populations surrounding projects where energy is produced, such as powerhouses, mines, or drilling operations. I use survey and interview data to argue that those factors do not adequately reflect the concerns of landowners distributed along the 303-mile path of a rural Appalachian natural gas project, which I identify as a site of energy transmission rather than production. I use social representation theory to elicit factors unrecognized in prior research. It provides a framework for the process by which resident rural landowners become aware of, interpret, evaluate, and then respond to the Mountain Valley Pipeline. Landowners express their sense of injustice when the pipeline developer, public policymakers, and permitting authorities are unaware of or indifferent to factors that are especially relevant to them as the pipeline is imposed on their rural environment.

The study is based on a sequential mixed-methods approach. I conducted a secondary analysis of the Quality of Life in Rural Virginia and West Virginia Survey dataset (Bell et al. 2019), which consists of mail surveys completed by 783 residents living in 10 counties along the route of the Mountain Valley Pipeline. In 2021 and 2022 I conducted follow-up semi-structured interviews with 25 landowners in the blast zone, which is 1,115 feet on either side of this pipeline, who had completed the survey. The first aim was to test three factors that prior research suggested are associated with attitudes toward such projects. The first factor, economic self-interest, was statistically nonsignificant for these landowners. The interview data suggest that unlike sites of energy production, where jobs stimulate support, landowners saw few jobs available for local people. Any financial value from the sale of easements did not affect their support. The second factor, political ideology, was important in other studies, because conservative ideology is associated with pro-business attitudes. In contrast, even though 60% of the landowners in this study identified themselves as conservative, there was only a weak association between political ideology and support for the pipeline, due in part to the perception of inappropriate application of eminent domain law by the pipeline developer and the courts. Distance from the pipeline, the third factor, was moderately associated with attitude toward the project, with less support for pipeline construction among landowners in the blast zone.

The second aim was to use social representation theory to reveal factors in addition to distance that influenced landowners' attitudes toward the project. Interviews revealed that landowners in the blast zone were as concerned with threats to cherished water supplies, for both domestic and agricultural uses, as they were with the danger of a pipeline explosion. The interviews also revealed participants' concern for the disruption of their attachment to and dependence on their properties. These factors were underrepresented in the planning and permitting for this project. The intuitive, common-sense structure for eliciting landowners' attitudes provided by social representation theory was effective at this microscale of inquiry, and may be useful for comparative studies that further distinguish between sites of energy production and sites of energy transmission.

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GENERAL AUDIENCE ABSTRACT

Recent research identifies a number of factors associated with public support for or opposition to environmentally-contentious energy infrastructure projects. Much of that research documents the attitudes of populations surrounding projects where energy is produced, such as powerhouses, mines, or drilling operations. I use survey and interview data to argue that those factors do not adequately reflect the concerns of landowners distributed along the 303-mile path of a rural Appalachian natural gas project, which I identify as a site of energy transmission rather than production. I use social representation theory to elicit factors unrecognized in prior research. It provides a framework for the process by which resident rural landowners become aware of, interpret, evaluate, and then respond to the Mountain Valley Pipeline. Landowners express their sense of injustice when the pipeline developer, public policymakers, and permitting authorities are unaware of or indifferent to factors that are especially relevant to them as the pipeline is imposed on their rural environment.

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Survey data suggest that factors, including economic self-gain, political ideology, and proximity to the pipeline, differ from predictions reported in prior research. Interview data suggest that in this case study those differences are associated with landowner attitudes toward danger and disruption to their sense of place. These differences may be specifically applicable to rural populations exposed to sites of energy transmission rather than sites of energy production. A recognition of these differences has important implications for project developers, public policy planners, and permitting agencies.

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I. Introduction

Environmental justice scholars have for decades studied groups organized in opposition to economic development projects that exploit marginalized and vulnerable populations. Malin (2014, 2015) and others propose a more inclusive and reflexive conceptualization of environmental justice that recognizes not only these ‘sites of opposition’, but also ‘sites of acceptance’: communities that, for better or worse, prioritize factors that coincidentally are advantageous to profit-oriented industries. Sites of acceptance may exhibit support for neoliberal logics, including free market ideology and policies that deregulate industries (Malin et al. 2017), or they may have a collective tolerance for an industry’s environmental harm, acquiescing to what some consider a “devil’s bargain” (Malin and DeMaster 2016:283) for the project’s potentially offsetting economic benefits. Sites of opposition, on the other hand, exhibit concerns such as the drive for forceful and equitable political protection from environmental hazards and the production of sustainable and minimally toxic environmental goods. After accounting for these economic and political ideological factors, there is as yet no clear conceptualization of the process by which individuals and groups, whether in support or opposition, evaluate the effects of potentially harmful environmental projects. How is it that some people, exposed to the same harm as others, support, are indifferent, or even acquiesce to what their neighbors oppose?

It is a problem that beyond these economic and ideological factors there is as yet no clear understanding of the process by which individuals and groups evaluate a potentially harmful environmental project, as a precursor to support, opposition, or other attitude, accompanied by a specific response. This research addresses a gap in the environmental justice literature with a case study of the Mountain Valley Pipeline (FERC/FEISa,b:2017), a new 303 mile long natural gas pipeline project in rural Appalachia, using both the Quality of Life in Rural Virginia and

West Virginia Survey (Bell et al. 2019) and interview data to examine the process by which property owners in the path of this contentious project interpret and evaluate a novel threat and its associated risk and then respond with support, opposition, quiescence, acquiescence, or indifference.

As the energy sector of the economy transitions from fossil fuels to renewable sources, the range and number of technological hazards has only increased (Erikson 1994:142). These hazards present new regulatory challenges for governments and technical challenges for industry. They also present a challenge to vulnerable publics impacted by novel strategies for energy production and transmission. At a microsociological scale, landowners and others in specific social categories are made vulnerable when exposed to utility-scale energy projects, conceptually similar to the vulnerability experienced by any group or social category exposed to any kind of natural or technological hazard. My intention in the case of this natural gas pipeline is to reveal insights into a social process through which segments of a vulnerable public define and respond to the risk associated with a novel environmental hazard. The analysis of the case uses a theoretical framework designed to track how vulnerable publics use pre-existing knowledge, values, feelings, and ideologies to interpret and evaluate how they represent a hazard. The individual, group, or socially defined category then has that representation available for the justification of a particular position, whether support or opposition at varying levels of action or inaction. The process that generates the social representation of a new environmental hazard expands our theoretical understanding beyond characterization of ideological differences by investigating the sources of those differences.

Devine-Wright and colleagues (2009, 2010, 2013, 2017) and others (Bergquist et al. 2020; Lemée et al. 2019) draw from Moscovici's (1984) social representations theory to provide

a structure for studying the processes by which individuals and social groups formulate and communicate environmental conceptions and choices. Social representations theory is a structured approach to the process by which individuals, groups, or social categories use their prior interpretations and evaluations of similar social objects or events to generate an understanding of novel, unfamiliar events. The approach is structured in the sense that each step in the process sequentially transforms ambiguous vulnerability into a more concrete understanding of an event (Moscovici and Duveen 2000). The product of that sense-making is then socially available to vulnerable publics as a resource for environmental resistance or acceptance. The interrogation of this sense-making process is important for environmental justice scholars who seek a fuller understanding of the complexities of contentious environmental discourse. It is also important for those who seek a balanced perspective in formulating public policy, since, when combined with economic and political ideological factors, it influences the attitudes of both supporters and opponents. Further, it may be important for both pipeline advocates and opponents who seek a more inclusive and reflexive conceptualization of the other. People in certain communities may or may not necessarily consider a gas pipeline to be a locally unwanted land use (e.g., Jerolmack and Walker 2018), and some communities, for economic or ideological reasons, may not believe that they live in an “environmental sacrifice zone.” In either case the social representations approach is capable of discerning the connection between pre-existing knowledge, values, feelings, and ideologies and the way individuals and community groups construct their positions regarding the novel event.

This study explicitly, and to my knowledge uniquely, uses the social representation process *to guide the sequence* of interview questions, as shown in Appendix A. The questions are aimed at tracing the process by which individual landowners and landowner groups who

explicitly either support or oppose the pipeline use their pre-existing knowledge to “make sense of a specific social object” (Provencher 2011:390): an alien intrusion into their landscape, which in this case is the natural gas pipeline. It assumes that there is a stable, structured pattern of reality that can be demonstrated through its use of the theory of social representations, developed by Moscovici and others to derive the testable hypothesis that property owners will use their pre-existing knowledge, values, feelings, and ideologies to interpret how they will represent the pipeline project, and then use that representation to justify their attitude toward the novel event. The word ‘attitude’ here refers to ‘feelings or emotions toward a fact or state’ (Merriam-Webster 2017). This is a multimethod study, using the qualitative data of in-depth open-ended interviews selected from among property owners purposely sampled to demonstrate the extreme effects of danger and disruption in the blast zone to validate the quantitative analysis conducted with a larger sub-sample of landowners similarly having property in the blast zone, from the Quality of Life in Rural Virginia and West Virginia Survey (Bell et al. 2019).

Landowner choice regarding support for or opposition to energy infrastructure projects, particularly unconventional oil and gas development (UOGD), has been subject to scholarly inquiry (e.g. Alcorn et al. 2017; Bugden et al. 2017; Jacquet 2015) that finds associations between community acceptance and perceived economic benefit and free-market ideology. Other studies suggest associations between opposition and environmental concerns and social justice (Gravelle and Lachapelle 2015). Beyond those predictors, the distinction between sites of support and sites of opposition remains unclear, prompting the present study. This study is limited to a consideration of two potential sources of harm that the Quality of Life in Rural Virginia and West Virginia Survey (Bell et al. 2019) indicates are top of mind in this rural Appalachian population, and may influence landowners’ attitude toward the project: first, the

danger that landowners may associate with physical proximity (Boholm and Löfsted; Lima and Marques 2005; Vorkinn and Riese 2001) to the pipeline, and second, the *disruption* to landowners' sense of place (Kyle and Chick 2007; Lewicka 2008; Lowe and Altman 1992; Relph 1976; Stedman 2003; Tuan 1977, 1980) that they may also associate with the project. The vulnerability associated with each of these sources of harm is conceived as a socially shared perception, and as such is not necessarily an objective reflection of the hazard or its associated risk. Landowners' prior conceptions of the pipeline's *danger* may be described as minimally subject to social negotiation or social construction (Brooks 2003), due to the ontological reality of the pipeline's capacity for harm. Perceived *disruption to landowners' sense of place*, by contrast, is profoundly informed by pre-existing socially and culturally mediated knowledge and thus closely shaped by social negotiation and social construction. Both danger and disruption are closely connected to distance from the pipeline, as demonstrated through the quantitative results of the survey and qualitative results of the interviews. Property owners' interpretation and evaluation of key risk factors, using social representations theory, may reveal important insights into the puzzle of resistance, acceptance, acquiescence, quiescence or indifference to the same pipeline project.

II. Literature Review

A. Introduction and outline of review

Research has identified a number of factors associated with public support for or opposition to environmentally-contentious energy infrastructure projects. These studies almost exclusively document the attitudes of populations that surround projects where energy is produced, from the mining of uranium ore to the nuclear electric generating facility, and from the fields where fossil fuel is extracted to the powerhouses where that fuel generates electricity. I refer to these as *sites of energy production*, and argue that the factors associated with public attitudes toward them do not necessarily apply to all energy infrastructure projects. I argue that these energy infrastructure facilities generate public attitudes that are qualitatively different from *sites of energy transmission*, such as oil and natural gas pipelines or the expanded electrical power grid that will be required for the transition away from fossil fuels. Sites of energy transmission are characterized by a linear rather than a circular geometry, which has implications for how they are received by nearby populations. A thorough understanding of those implications requires a review of how populations respond to the potential for harm, so I ground that understanding by examining the conceptualization of risk. Risk itself is a social construction that may or may not trigger organized opposition, so I also review factors associated with response toward environmentally contentious projects. My research examined the association between three factors: economic self-gain, political ideology, and geographic distance from the pipeline, and attitude toward the pipeline project that is the subject of this study. The importance of physical location stimulated a close reading of the literature on sense of place, and in particular landowners' reaction to danger and the disruption to their sense of place. Lastly, I survey the

literature on social representation theory, as an organizing structure for both my interviews and their interpretation. Landowners' evaluation of the pipeline project may inform their decision whether to act or not act either in support or resistance to the pipeline project. Action or inaction can range from inaction in the form of either acquiescence or indifference, through the potential for action that we call quiescence, to the fully realized manifestation of either opposition to or support for the pipeline project.

This investigation is embedded in the broader sociological question of how it is that people who are exposed to the same potentially harmful object or event often choose inaction instead of action, and support instead of opposition. That problem vexes social movement and environmental justice scholars now, as it has for decades. In the spirit of activist sociology, the review concludes with a summary and critique of Mountain Valley Pipeline documents and anti-pipeline activism.

Social representations theory provides a framework for understanding the process by which prior experiences shape responses to novel objects or events. In a most general sense, "representation is an activity [the process of representing] with an observable outcome [an elaborated idea, a designed object, a representation]." (Bauer and Gaskell 1999:167). The purpose of the representation is that its use makes sense of novel phenomena. A central thesis of this research is that landowners in the path of the Mountain Valley Pipeline project use their prior conceptions of *danger* and *sense of place* to resolve their ambivalence and inform their sense of the project's potential for harm.

B. Risk and its connection to hazards with the potential for danger and disruption

The study of risk was originally described in terms of rational or probabilistic responses to uncertainty, but more recently appropriated by the social sciences to include a wider range of

human response to threat, including responses to danger and disruption. Social science approaches establish risk as a social problem, so the review will emphasize concepts consistent with that perspective.

Risk: Major approaches to a central theme in the social sciences

Humankind has been preoccupied with uncertainty since prehistoric times. Humans recognize that much is unknown and unknowable and hasten to ensure their security through the remedies of religion and science (Anderson 2005; Luhmann 1993;). Augury and sacrifice bought a measure of security prior to the Commercial Revolution (1275-1375), but by the 13th century Italian shipping merchants were using insurance contracts to protect against loss (de Roover 1945; Ewald 1991). The conceptual history of the term “risk” in its association with uncertainty seems to derive from the late Middle Ages. Its use recognizes risk as a specific kind of problem that can be managed, distinguished from danger, chance, or luck (Kuske 1949, f.n. in Luhmann 1993:10).

From the mid-1800s on, risk became increasingly associated with the speculative investment of capital by merchants and industrialists (Mythen 2004:13). In this sense risk is associated with the probability of return or reward, which therefore associates risk with rational decision making (Wilkinson 2001:91). At about the same time the concept of risk was also politicized as social problems were framed as “risks for society” (Wilkinson 2010:19). Hacking (1990, 1991) describes Britain in the period of 1820 to 1840 as being deluged by an “avalanche of numbers.” This turn toward the gathering of numerical data allowed policymakers to use statistics to identify groups considered a danger to social stability, and therefore in need of regulation. However, even as more sophisticated statistical measures were used for rational social planning, policymakers came to recognize circumstances that could not have been

predicted (Bernstein 1998). Whereas risk assessment had come to refer to a predictable outcome of a set of circumstances, Frank Knight (1921:233) argued to generations of insurers and economists in the early and mid-20th century that risk should be conceptually distinguished from uncertainty: uncertainty is incalculable, whereas risk is knowable, and therefore can be calculated (Arnoldi 2009:33). Since its quantification is problematic, uncertainty should then be no more than a residual factor in the calculation of risk. As will be seen in the following review, major contemporary approaches to risk focus on efforts to predict and control an increasingly uncertain future. This requires the calculation of not only what has been, but also what might be (Adam, Beck, and Van Loon 2000; Ewald 1991:202). The power and the challenge of these newer approaches is that they recognize the inadequacy of conceptualizing risk in purely probabilistic terms that do not centralize uncertainty. These newer approaches are of such importance to the social sciences because the uncertainty assumed by risk is often not voluntary, as is the case when a shipping merchant or mutual fund investor makes a decision that may benefit them, but rather may be socially constructed and may involuntarily impose uncertain consequences on vulnerable classes of people. The approach of this study is not to throw out the rationalist approach to risk, but rather to demonstrate that a full understanding of risk requires a recognition that risk is also a social construction.

A number of commentators (Arnoldi 2009; Lupton 1999b; Wilkinson 2010) suggest that there are three major approaches to the social construction of risk: those associated with the work of Mary Douglas (Douglas and Wildavsky 1983, Douglas 1992), Ulrich Beck (1992, 1995b, 1999), and a number of theorists (Dean 1999; Ewald, 1986, 1989, 1991) inspired by Foucault (1991). Applied to the present research, these theoretical framings inform a “risk discourse” focused on environmental problems that emerged in the 1950s and 1960s (Strydom 2002: 11-35).

They all reflect what Giddens (1990:9) called modernity's double-edged sword of security and danger. During that time expert opinions, relying on rationalistic and probabilistic models of risk, excluded the concerns of impacted publics. Consequently, these publics turned to popular sources for insight, in issues such as the risks associated with nuclear energy (Falk 1982), pesticides (Carson 1962), the "population bomb" (Ehrlich 1968; Hardin 1968) and the limits to growth (Gore 1992; Meadows et al. 1972).

A rationalistic and probabilistic approach to the public exposure to risk prevailed unchallenged throughout much of the 20th century (Arnoldi 2009:34; Hacking 2003:27). Risks were calculated and managed by scientists and engineers who formulated acceptable standards of safety regarding everything from bridge construction to tobacco use. By the 1970s and 1980s, however, the public had grown apprehensive about the unchecked growth of technology, which seemed to favor industry over people and the natural environment. The staggering range and impact of anthropogenic (human caused) disasters involving the nuclear (Cable et al. 2008), petrochemical (Commoner 1987), mining, military (Ehrlich and Birks 1990), agricultural, marine and medical (Kroll-Smith and Floyd 1997) industries are comprehensively surveyed by such writers as Jared Diamond (2005) and Lee Davis (1998).

Against this backdrop Mary Douglas and Aaron Wildavsky argued that the traditional understanding of risk, with its assumption that risk assessment is based on an individual's probabilistic thinking, fails to recognize that risk is a collective or social construct (Douglas 1973; Douglas and Wildavsky 1982; Douglas 1992). This is an important insight for the proposed research because it is a theoretical basis for surveying landowners' collective response to what is demonstrably the rationalistic and probabilistic assertion of insignificant impact by the pipeline developer's expert authorities. So this research may find a fundamental disconnect

between experts who view risk probabilistically and impacted publics who view risk as a social construct (Douglas 1992:11).

Douglas argued in her enormously influential *Purity and Danger* ([1966] 1984) that danger occurs when a prescribed symbolic order is breached. Her work has been criticized (Arnoldi 2009:46; Cockerham 2006:6; Wilkinson 2010:52) for the conservative political bent of its structuralist arguments, influenced by the later writings of Durkheim (Douglas 1978; Durkheim 2001; Durkheim and Mauss 1963) regarding the binding power of social solidarity. However, there is still support for her argument that the maintenance of social structure requires the creation of cultural boundaries that promote group solidarity (Arnoldi 2009; Luhmann 1993:3). When those boundaries are threatened, people feel a sense of alarm that is articulated as pollution. This “perception of pollution (Willow et al. 2014:61) can be as psychologically damaging as the hazard itself. Social stability requires a political accounting for this disruption to social values: when disaster strikes, someone or some group must take the blame for disrupting order (Douglas 1992:6; Lupton 1999b:3). Particularly in the cases of risk associated with technological and ecological problems, Douglas’s perspective foregrounds the question of who decides when a risk can be ignored, and who takes the blame. In the present study, a misfortune, such as the perceived disruption to a sense of order associated with the construction of a natural gas pipeline, can, following Durkheim’s argument regarding the political use of crime, be used to enhance social solidarity, as may occur within a pipeline social movement organization. A cultural boundary is thereby created, illustrated by the distinction between those who would literally and symbolically pollute a valued creek, and those who would defend its purity. In the case of the danger associated with a pipeline explosion, Douglas (1992:55) offers anthropological evidence that members of tribal societies, in a similar way, perceive low-

probability dangerous events, and tend to transfer their personal concern onto their social institutions, which may be reshaped to maintain order. In this way if there is an element of rationality, it occurs at the institutional rather than the individual level (Douglas 1992:63). In summary, Douglas argues that as people worry about the risk of pollution, there is a clash between things that should be kept separate. This is precisely what happens when a pipeline pollutes a pristine environment. For example, trenching may flush fertilizer and pesticides from farm fields into nearby streams and lakes. Rayner (1992:86) says that in *Purity and Danger* Douglas' concern "was more with moral than with environmental pollution." In her next book, *Natural Symbols* (1970) she explores the connection between culture and nature more explicitly. A paper that followed shortly thereafter, "Environments and Risk" (1972) and *Risk and Culture* (1982) further developed her argument for the association between danger and a polluted environment. Throughout her writing, that which is, I would say, perhaps oversimply, taxonomically different is the source of risk. So, for example, shellfish are considered unclean or polluted because they lack the fins and scales of most sea creatures. Similarly, it may be that a property crossed by a hazardous materials pipeline becomes taxonomically different from neighboring property: both physically and symbolically polluted.

Mary Douglas argued that acceptable risk is never simply a matter of calculating probabilities, and always involves a political dimension that must be faced by scientists, engineers, governments, industry, and the general public (Douglas 1992:44-45). Ulrich Beck has championed this approach, forcefully arguing that modernity and postmodernity (or what he calls a 'second modernity') constitute a 'risk society' in which political decision results in the socially unjust distribution of risks (Beck 1992, 1995b). Beck's formulation of the relationship between sociocultural theory and risk phenomena has been called the "sociological diagnosis of the

times” (Lash 1994: 118). Beck claims that a new range of risks has emerged since the late 1960s: unintended side effects of technological development (see Ewald 1986 and O’Malley 2004:179 for evidence of an earlier emergence). Beck regards these risks as explicitly ‘social constructions’ (Beck 1995b:92), achieved through public discussions in a cognitive process of social definition. He argues that conflicts over the distribution of wealth, central to industrial society, have been replaced by conflicts over the distribution of risk. “Need is hierarchical, but smog is democratic” (Beck 1986:48). The pattern remains that wealth accumulates at the top of the social structure and risk sinks to the bottom, similar to recent socioeconomic arguments such as by Galbraith (2008) and Piketty (2014). Beck distinguishes between risk that can be considered ecological, financial, the result of terror, and adds a fourth type, social or biographical, without claiming that these categories are mutually exclusive (Beck 2007:37). Among these, he distinguishes the risk of terror as wholly intentional, but still similar to the others in its involvement with technology. Intentionality figures prominently in Beck’s writing, as it does in recent distinctions between threat, which implies intentionality, contrasted with hazard, which does not (DHS Risk Lexicon 2010). He also refers to second modernity as ‘reflexive modernization,’ by which he means that society self-inflicts unintentional problems. These are, he argues, the result of the success of modernity’s basic principles, which have undermined society’s institutions (Arnoldi 2009:50-51). Beck argues that risk must be studied and addressed democratically on a global or ‘cosmopolitan’ scale if “self-annihilation” is to be avoided (Beck 1995b, 2004). Even at this magnitude he remains optimistic about the potential for successful management of risk, paradoxically through anti-globalization movements. Beck’s writing has had tremendous appeal, perhaps because it is overtly political, arguing for radical social change in the face of global catastrophe. In the context of the present research Beck’s

theorization draws attention to risks such as climate change that pipeline opponents might consider broader than the more narrowly defined challenges to cultural values emphasized by Douglas.

The third major approach to risk neither characterizes risk as a device for maintaining group solidarity nor as a means to draw attention to large-scale catastrophic danger. This third approach to risk is influenced by Michel Foucault's politically charged theme of 'governmentality' (Foucault 1982, 1991), drawing on his theorization of the relationship between power and subjectivity. For Foucault power is an exercise among partners in which those being led tend to act within a 'field of possibilities' (Foucault 1982:220-221). Government is the partner that structures the public's range of possibilities. The emphasis is on the individual's freedom to choose what they consider a responsible alternative within this range of possibilities. Risk, then, is considered an example of a means by which people 'conduct their conduct,' and it is assumed that they will act in their best interest (Dean 1999b:131-132). This argument is not without its detractors, who see it as explicitly serving the interests of neoliberal capitalism (Dean 1999b; Petersen 1996), because it tends to diminish the role of government as an agent of social welfare. Polanyi ([1944]2001) cautioned against such deregulation by warning of the negative effects of marketization of land and labor, which he called "false commodities." Giddens (1990:9) similarly warned that modernity is a double-edged sword, in which security is balanced by danger and trust is balanced by risk. Ideas such as these are codified into American tort law with the 'zone of danger' rule, which asserts a threshold for the assertion of emotional stress, namely that the courts "must first find that a defendant's actions might reasonably have placed the plaintiff in fear of physical injury" (Calendrella 1992). They are also clarified by the Access Model of Blaikie and associates (1994), according to which hazards and risk have specific

characteristics of space and time that trigger a disastrous event. There may be evidence of this approach to risk in the strategy of pipeline developers, who argue that a fair settlement for crossing private property should follow a rational, predictable market mechanism by which a willing buyer of the right to cross a property comes to an agreement with a seller of that right. Detractors would counter that property owners' range of possibilities is severely constrained by an alliance between business and government that allows a private business to exercise the power of eminent domain. Again, Polanyi's argument is consistent with the non-market value that rural people place on their land. In my view the monetization of risk to property by pipeline developers is an example of a "local neoliberalism" embedded in a larger neoliberal structure (Peck and Tickell 2002). For Blaikie and associates, hazard vulnerability may be the result of personal choice, as when a person chooses to live in an earthquake zone, or a seaside town vulnerable to a tsunami. But those vulnerabilities preceded the property owners' decisions. They do not apply to property owners subject to a pipeline project that they could hardly have predicted.

These three perspectives together comprise a fully developed modern risk discourse that is no longer dominated exclusively by experts and regulatory agencies, but increasingly considers factors that push impacted publics toward social change. The application of these perspectives to the disconnect between experts and publics has much to do with differences in perception, so subsequent discussion will often refer to perceived risk or risk perception. Experts tend to perceive risk probabilistically and apply rationalistic market logics to risk compensation. Impacted publics tend to perceive risk as a social construct, imposed involuntarily in a manner that is inconsistent with their goals and values. Noëlle McAfee (2004) suggests we think of publics as forms of energy, seeking a path forward, rather than as static or passive entities. This

sense of the word informs my understanding of the concerns that animate contesting groups. These publics may see the range of anthropogenic hazards to natural and human environments as an unjust imposition of political will on a vulnerable and marginalized people. Their collective response, their best interest (Finkel and Muller 1998), may be to amplify the public perception of risk to mobilize support for collective action, just as the best interest of government and industry may be to argue that an environmental hazard results in an insignificant risk.

A core vocabulary for the study of risk

A number of authors note the tension between objective and subjective definitions of risk (Rayner 1992; Thompson and Wildavsky 1982). This is consequent to a much larger 20th century intellectual critique of objectivity in the philosophy of science, stimulated by the work of Popper (1935), Polanyi (1946), Kuhn (1962), Feyerabend (1978) and others, ultimately deriving from the traditional Cartesian bifurcation between mind and body. Resolution, particularly as it relates to risk, seems to involve knowledge production that is a combination of “inside out” (subjectivity) and “outside in” (objectivity). Furthermore, such arguments as Wittgenstein’s (1953) against the notion of a “private experience,” and Berger and Luckman’s declaration that “all [knowledge] transmission requires some sort of social apparatus” (1966:88), provide the epistemological underpinning for a social construction of risk. “Risk is always a social product,” say Thompson and Wildavsky (1982:160). As discussed in the previous section, this is an argument shared by risk theory’s leading social theorists (Aven and Renn 2009, 2010; Kasperson et al. 1988; Slovic 1999). However, Rayner (1992) argues that such a position requires some qualification that relates to both the tension between objective and subjective definitions of risk, and also to the social construction of risk.

Risk, from the technical perspective of the engineer or insurer, ideally involves the impartial, unbiased gathering of data and the finding of fact, which can then be used to generate a calculable the probability of a future event. Renn (1992a:58) describes this perspective as an actuarial approach in which the base value is “the relative frequency of an event over time.” There is no doubt that risk has some basis in the physical world. The laws of physics exist irrespective of human volition, and probabilistic assessments of risk recognize the potential for physical harm. So, a definition of risk should maintain some connection to this objective reality. I will later acknowledge this physical location for potential harm but qualify its biases by interrogating it as a weak social construction, meaning that it does not rely on a strong social interpretation for its existence.

Social scientists argue that risk is considerably more complex than what gets captured by the average probabilistic definition of risk (Douglas 1985; Freudenberg 1988; Hoos 1980; Kasperson et al. 1988). Kasperson and associates (1988), in an attempt to answer the question of why some risks that are considered minor by technical experts elicit strong concern on the part of the public, embedded technical risk assessment within sociological, psychological, and cultural processes in what they termed the social amplification of risk. I suspect a potential conceptual linkage between the thesis of the social amplification of risk and McAdam, Tarrow, and Tilly’s (2001:126) ideas about how the claims and identities of parties aggrieved by injustice get processed in the emergent phase of a social movement. Both risk perception and movement emergence speak to complex activities that elude single-dimensional explanation.

Arguments for the social definition of risk run counter to assertions that risk identity, assessment, and management must rely only on the mathematics of probability and uncertainty. Thompson and Wildavsky argue that “Risk, although it has some roots in nature, is inevitably

subject to social processes” (1982: 148). They use anthropological evidence to support their argument that there are no universally predictable human responses, even when faced with similar risks. Cultural context provides exceptions to any rule.

Paul Slovic, a leading researcher in the psychometric study of risk, similarly argues for the need for a multidisciplinary perspective (1987; 1992; 2000), integrating cultural, economic, political, and other social variables in the assessment of risk. He argues for the need to close the gap between the perceptions of experts and the perceptions of the public, particularly with regard to the dangers imposed by modern technology. He and his colleagues discovered years ago (Slovic, Lichtenstein, and Fischhoff 1984) that the social impact of a disaster, which is to say the public response, is influenced by whether or not the event was previously well understood and its risk profile well addressed, rather than by its likelihood of occurrence. Therefore, something like a train wreck, which is well-understood by the public, is perceived as less of a risk than an accident at a nuclear powerhouse, even though deaths by train wrecks are statistically more likely than deaths by nuclear accident. Public concern regarding risk may even be a surrogate for other issues (Douglas and Wildavsky 1982; Short 1984), motivating the need to uncover other agendas for closer examination (Edwards and von Winterfeldt 1987). In the case of the Mountain Valley Pipeline, this suggests that concern about the risk of explosion may mask concern for other issues, such as fracking or the association of fossil fuels with climate change. Otway and von Winterfeldt (1982) suggest that people will endure exposure to risk if it is considered justifiable but will resist even the slightest risk if it is imposed against their will or if it runs counter to their values. Furthermore, people do not always opt for minimizing risk (Renn 1992a:77). For instance, investors willingly assume risk in the hope of financial return. And

Cockerham (2006) argues that we are “society of risk-takers,” whether engaged in unsafe sex, alcohol and drug use, or extreme sports.

The organization of risk management can also influence public perception of risk. The modern state has been tasked with regulating risk, through programs and policies that promote the welfare of citizens (Beck 1994, 1996; Crook, Pakulski, and Waters 1992: chapter 3). Crook (1999) reviews political problems associated with the idea of state-organized management of risk. Legislation, regulation, inspection, and enforcement all require a governing apparatus for surveillance and discipline. This organization recalls the Foucauldian literature on governmentality, and Crook follows the thread into a critique of the neoliberal emphasis on self-regulation. “Individual agents must become risk monitors and risk calculators” (Crook 1999:171). This abdication of governmental oversight can result in an increase in public exposure to risk. Again, the dearth of inspectors and the necessity for citizen experts in the reporting of environmental harm in the construction of the pipeline has led to a decline in confidence in governmental and corporate oversight. Citizen input through such mechanisms as public scoping sessions then become what Zeckhauser and Viscusi (1996:152) call “ceremonial commitments to public safety.” Crook suggests that the ritualistic aspects of these public displays creates an opposition between government and the public. When part of this public forms what Douglas calls a “voluntary group,” the liminal or marginal status (neither fully government nor simply public) of that group can achieve what Victor Turner (1995:110) refers to as *communitas*, which is a statusless, egalitarian, and vulnerable position in society. In certain respects, the voluntary group can use its *communitas* as a form of resistance, similar to Scott’s (1985) weapons of the weak and similar to the extrainstitutional locus that is fundamental to social

movements (McAdam and Snow 2010:1; Meyer 2015:12). The organization of resources and resourcefulness may in this case build landowners' capacity for resilience.

A discussion of the organization of risk management prompts additional questions about risk-taking. Who is in the best position to assess risk? Risk studies traditionally assumed that a combination of the disinterested empiricism of fact-finding and the calculation of probability resulted in an adequate assessment of risk (for review, see Krimsky 1992). Beginning in the 1970s, legislation for the protection of the environment, such as through the Environmental Protection Agency (EPA), professionalized the field of risk assessment. National Science Foundation (NSF) funding favored many studies that recognized the relationship between advances in technology and the analysis of risk (Krimsky 1992:27). However, the social and cultural contexts of risk were unrecognized in these early studies. They were eventually recognized by Thompson (1980), Thompson and Wildavsky (1982), Rayner (1984), Luhmann (1993), and other academics surveyed earlier, who suggested that the definitions of risk used by engineers and psychologists were unrealistically narrow. This recognition was strengthened by a broader societal discussion about whose values were to be recognized, and whose would be violated. Habermas (1971) argued that a discourse among involved parties is necessary for a viable resolution of conflicts in a democratic society. Fiorino (1989, 1990) and others (Otway 1987; Plough and Krimsky 1987) recognized the lack of citizen participation when information flows only from experts to the public, characterizing risk communication as a technocratic rather than a democratic process (Fiorino 1989). Meadowcroft and Fiorino (2017) more recently called for a recognition that as concepts employed in environmental policy evolve, so too does the public's need for awareness of these concepts. Categories such as sustainable development, biodiversity, and the green economy, unconceptualized until recently, are now necessary for

effective discourse between experts and publics. Calasanti (personal communication, June 29, 2019) suggests that people's assessment of risk at any time may be based on new information regarding previously unforeseen consequences, such as when the discovery of pollution due to groundwater leakage compounds previous fears of catastrophic failure at a production or storage facility. Giddens (1991:4) and Beck (1992:19) argue similarly that modernity has introduced unanticipated forms of high-consequence risks that they call manufactured or fabricated uncertainties, resulting in the erosion of public trust.

Kates and Kasperson (1983:7029) suggested some time ago that "risk" is a measure of hazard, and a "hazard" is a threat to people and to what they value. This suggests a definitional difficulty that remains today. Risk is often defined in terms of a "measure," but then it is necessary to ask who is doing the measuring and interrogate their motives. Furthermore, if risk must be a measure, what are we to make of situations where individuals or societies are not even conscious of the risk? Who does the measuring in that case? Luhmann (1993:6) declared "There is no definition of risk that could meet the requirements of science," and that seems to still be the case. Risk is often used synonymously with danger (Lopez 1987:265), but it often seems that danger can exist without consciousness of risk. Risk is sometimes, but not always, the opposite of security, in the sense that a choice may be made between two alternative risks that are assumed to be equal, but in fact one may actually reduce one's security. When the definition of risk is tied to a decision, assuming rationality, it sometimes happens that a correct decision can nevertheless have an unfortunate consequence, and an incorrect decision may have a happy ending. Furthermore, it may seem that a decision involving risk had a fortuitous outcome in the short run, but lead to misfortune in the long run, or vice versa. These kinds of issues illustrate the difficulty in posing a definition of risk.

Plough and Krinsky (1987:8-9) provide a path forward for the present study. They say that “cultural reason does not deny the role of technical reason; it simply extends it.” In Mary Douglas’ chapter on risk and danger (1992:38-54) she speaks of a cultural dialogue consisting of the competing claims held by various groups with different goals or values. Her point is that risk involves political calculations that complicate any pretension to probabilistic decisionmaking. She explicitly endorses Beck’s powerful condemnation of instances when power and wealth are used to subject vulnerable groups to excessive risk. The argument for extending the definition of risk beyond the technical calculation of probability and into the social is also pressed by Krinsky (1992:17), who says that people do not use probability estimates to solve complex problems; instead they use discernable rules of judgment called heuristics to simplify the problem. These heuristics may lead to a biased decision, but it would be a mistake to say that people are not behaving rationally just because they ignore expert risk assessment based only on probability (Krinsky 1992:24; Slovic 1992:110). Douglas would say that people’s perception of risk is biased by the way they classify their world, as well as by their system of norms (1992:1). She does not dismiss the physical danger of risk but argues that a complete conceptualization of risk combines a physical component and a social construction. This approach is consistent with social ecological arguments reviewed later, even touching some elements of “deep ecology”, construed as “networks or fields of relations in which things participate and from which they cannot be isolated” (Naess 1989:49), quoted by David Harvey (1996:153). Harvey illustrates this by suggesting that we cannot value a fish independently of the water in which it swims. Similarly, the conceptualization of risk demands an inclusive ontology that considers both empirical reality and social context.

Both Beck ([1986]1992) and Giddens (1990) emphasize that modernity requires a new vocabulary for the study of risk. They argue that in the modern era, the neutral, probabilistic definition of risk became complicated by previously unknown risks. They characterize postmodern risk generally but are particularly troubled by new forms of risk associated with the environment. By postmodern I mean the standard amalgamation of the work of poststructuralists including Lyotard, Derrida, and Foucault, emphasizing the continuous reconstruction of knowledge through the application of political power. Beck and theorists influenced by Foucault are particularly sensitive to the dynamic, unstable nature of what Beck calls the risk society. Just as the Flint water crisis (for review, see Baum et al. 2016) was unrecognized prior to 2014, similar environmental disasters involve a destabilization in the public's confidence in society's "experts." The intent in this discussion is not to denigrate scientists, engineers, or other "experts," and does not imply that they have conspired against the public, but to suggest rather that the public is not irrational when it disagrees with the risk assessments of experts.

Risk as a problem for the Mountain Valley Pipeline

David Harvey (1996) argues that environmental problems are due to an authoritarian hierarchy, a social structure that also produces social hierarchies. His case is strengthened by evidence that authorities are dismissive of public concerns about environmental risks. Fox (1999) is concerned with how people might resist such authorities' assertions about how they should behave. He concludes his discussion not with a critique of industrial society, but rather with a call for people to define what it means to be safe and healthy. The present extended discussion of the definition of risk is motivated by the necessity for a thorough understanding of the political implications behind the meaning of risk. The Final Environmental Impact Statement (FERC/FEIS:2017b), prepared by the Federal Energy Regulatory Commission for the pipeline in

this study, provides an illustration. In response to public comments regarding the safety of the pipeline, the FEIS cited statistical data regarding fatality rates, establishing that the probability of a fatality is approximately .01 per year per 1,000 miles of pipeline. This establishes natural gas pipelines as an example of a low-probability, high consequence hazard, which Giddens (1990:133) associates with the process of globalization in contemporary society. The FEIS includes tabular data indicating that natural gas transmission lines have fatality rates “much lower than the fatalities from natural hazards such as lightning, tornadoes, floods, earthquakes, etc.” (FERC/FEIS 2017b:4-572). The inclusion of such data seem to argue that impacted publics should respond to threat by recognizing the probable consequences of the pipeline. Nowhere in the FEIS is there any recognition that public response to environmental threats should be based on anything other than probabilities. Von Winterfeldt and Borchertding (1981) studied such low-probability/high-consequence (LP/HC) risks and found that exposed publics usually perceive such risks as more threatening than risks with higher probability but low or medium consequences. Douglas (1992:77) similarly argues that “political lobbies, new political movements, and public interest groups,” among others, are “most keenly alert to low probability, high consequence danger,” particularly when used to assign blame or exoneration from blame (Douglas 1992:60). The contemporary literature on accident and disaster preparedness (e.g. Lempert 2009) underscores the difficulty of designing models of assuredness in such areas as shipping and construction because there are such high levels of uncertainty, so it is no surprise that publics are wary of the arguments by pipeline developers. Lempert summarizes the difficulties from a legal perspective, arguing that very low probability/ very high consequence events are particularly hard to anticipate, and concludes from his examples: Three Mile Island, the Exxon Valdez oil spill, the September 11, 2001 attacks, and the flooding in New Orleans,

that the court system will continue to be incapable of doing other than muddling through in the face of unexpected events that create unprecedented harms. So, despite Harvey's assertion that authorities are dismissive of public concern for environmental problems, an alternate argument can be made that authorities simply have no control over an increasingly unstable and unpredictable world.

From the foregoing discussion it follows that a concise definition of risk should include a measure of the probability that an adverse event will occur, and an estimate of the consequences of that event for populations with differing vulnerabilities. Wilson and Crouch (1982), in response to a public wary of Reagan-era calls for the loosening of regulatory oversight, first proposed such a formulation and it has become a convention: risk is the probability of an adverse event times the consequences of that event. Starr (1969) had earlier used "risk assessment and comparison" as a way of describing the risks of hazardous technologies by comparison with other better-known risks. "A good example of this twofold, explicitly descriptive and implicitly rhetorical, argument is as follows: first, 'the cancer risk of living at the boundary of a nuclear power plant for five years equals the cancer risk of eating 40 tablespoons of peanut butter (due to aflatoxin), and second, 'if you are willing to eat 40 tablespoons of peanut butter over the next five years, then you should be willing to live near a nuclear power plant' (Roth et al. 1998:57)." But public confidence is more than just "getting the numbers right" (Fischhoff 1995:138). Habermas (1976) argued that a precarious ecological balance was producing a "legitimation crisis", a shift away from the public's unquestioning acceptance and trust in society's institutions. This recognizes that the public's perception of consequences is also important. Wilson and Crouch, in a later article, concluded that publics "do not always compare the risk averaged over time, but worry more about risks that are sharply peaked in time" (1987:269).

Beginning in the 1980s risk analysts began to realize how difficult it is to formulate general rules for the social acceptability of risky technologies (for review see Boholm and Löfstedt 2004). They instead began to concentrate on the perception of risk (Strydom 2002:24). In one major research development, risk perception scholars found that both the probability and consequences of a risk event may be amplified, or even attenuated (using an electronic metaphor), by social, institutional and cultural processes that shape risk perception and the social response to uncertainty. The social amplification of risk framework was developed in the 1980s and 1990s (Kasperson et al. 1988; Kasperson 1992; Pidgeon et al. 2003; Renn 1991), and with modifications continues to describe the dynamic process by which risk is perceived and managed. In this framework the social response to a risk source is directly influenced by risk perception and media reports, so risk communication become central to risk management (Burns et al. 1993). Bendix and Liebler (1999) and Martin (1988) connect increased media coverage with decreasing distance from a controversial event. For a review, see Kasperson et al. (2003); for a critique that centers on the social amplification of risk framework's tendency toward "tuning out" unnecessary noise in the transmission of risk information, see Murdock et al. (2003:158-159). The social amplification of risk perspective and other approaches initiated in the 1980s (Strydom 2002: 25) studied risk at the level of the individual, but lose predictive power in that they are insensitive to the fact that risk is an uncertain, contested, and moving target, subject to change as new knowledge is revealed, with its attendant inaccuracies and biases (intentional or unintentional, through rumor, the media, state agencies or industry, etc.). Complex, dynamic, contested and uncertain public forms of knowledge, formulated and communicated by lay experts and social movement activists, recognize the culturally structured social perception of

risk. Accordingly, Rosa (2003:56) offers the following definition of risk that captures the idea that risk is a complex reality whose outcome is uncertain:

Risk is a situation or event where something of human value (including humans themselves) is at stake and where the outcome is uncertain.

Risk is thereby located in an ontologically real world, but it excludes situations that are certain (when probability is 100%), and situations in which human stakes, whether certain or not, are not involved (such as the behavior of the planets or sub-atomic particles). The economist Frank Knight ([1921] 2006) first drew attention to the problem of uncertainty in risk-taking, but it was the sociologist and philosopher Niklas Luhmann (1992: Ch. 2), whose systems theory is epistemological in that its focus is on how observers observe, who further developed the argument that when the probability of an outcome is certain, it is no longer a risk, because the outcome is known. Risk then always refers to an event at some uncertain point in the future (Adam and van Loon 2000:2; Giddens 1998:27; Lupton 1999a:74). Rosa (1998) and Renn (1998) do make clear that risks, although subject to social processes, have real consequences. For example, if a segment of pipeline explodes, it is no longer a risk, because the probability that the event will happen is 100%. It becomes, at that precise point in time, a disaster.

The discussion so far is intended to sensitize the reader to the difficulty in defining “risk”, a key concept for the present research. It also suggests key parameters: probability and consequence, negotiated through social construction. But there is no consensus in negotiating the definition of risk. Consensus would require agreement among contending groups. This would require the relinquishment of power, which is unlikely. However, one particularly comprehensive and well-vetted contemporary source of vocabulary for the study of risk is the U.S. Department of Homeland Security’s (DHS) Risk Lexicon (2010), composed of 123 risk-

related definitions, “validated against glossaries used by other countries and professional associations” (2010: vii). The Risk Lexicon defines “risk” as the

potential for an unwanted outcome resulting from an incident, event, or occurrence, as determined by its likelihood and the associated consequence.

The DHS definition is included here because it reiterates the combination of probability and consequence first proposed by Wilson and Crouch in 1982 and because its reference to an unwanted outcome reflects the uncertainty referenced in Rosa’s definition. The use of the term “potential” indicates that the outcome is uncertain. The reference to an incident, event, or occurrence is similar to Rosa’s earlier reference to a situation or event. Note that this definition reveals a security apparatus’ bias toward the avoidance of the negative consequences of risk. This bias ignores choices that people make willingly, such as smoking and bungee jumping (an example of recreational risk), that may result in both wanted and unwanted outcomes (Cockerham 2006). Another reason for citing the DHS Risk Lexicon is that it provides a useful comprehensive framework for integrating a broad vocabulary of risk-related concepts, used not only by DHS risk practitioners but also by other government agencies and in academia (DHS 2010:43). If state actors and environmental activists are to communicate their positions unambiguously to each other, the DHS Lexicon is one widely accepted vehicle for such communication. Furthermore, its use elevates issues of environmental injustice to that of other threats to national security.

The vocabulary of risk used by government and industry tends to be rationalistic and probabilistic. No matter how useful that vocabulary may be for many purposes, Habermas (1989) encourages an open debate between the understandings of civil society and the state. Renn

(1992c) and Strydom (2003:2) extend this ideal to the arena of political debate over risk policy. Who decides which definitions of risk are more valid? They argue that all perspectives should be represented. For example, definitions of danger and loss are conspicuously absent from the DHS Risk Lexicon, and vulnerabilities due to demographically unequal exposure to harm are peripheralized. These are subjective categories that emphasize uncertainty, particularly “manufactured uncertainties” for which the timing of an impact cannot be accurately predicted (Arnoldi 2009: 62; Beck 1999:12). Beck is particularly critical of regulatory agencies that divest themselves of responsibility for risks that impact public health and safety. He connects the resultant poor and erroneous risk communication to a loss of public confidence (Mythen 2004:139). The concluding section of this discussion of a core vocabulary for the study of risk examines literature describing the process whereby organizations and publics communicate their perceptions of danger and disruption through the social construction of risk.

Danger and disruption to sense of place in the hazard and disaster literature

This survey of the risk literature identifies and critiques major arguments that distinguish between danger and risk. Loss as a disruption (Devine-Wright 2009) is less well articulated in the literature but will be developed in contrast to danger in subsequent discussion. Loss is more fully developed in the literature through its connection to natural hazards such as flooding and earthquakes, rather than hazards of anthropogenic origin (Stein and Stein 2013; Sullivan-Wiley and Gianotti 2017), although in the age of global warming it is hard to separate natural from anthropogenic hazards, particularly in a multi-hazard environment. For this discussion both danger and disruption through loss of sense of place are considered similarly hazardous (Douglas 1992:40). As hazards, danger and loss are each sufficient to initiate a socially mediated process of risk construction. That risk is then available as a resource for communicating a political

position (Wildavsky and Dake 1990), in this case by either anti-pipeline activists or government and industry. The logic of the argument is expressed visually in the model shown in Figure 2. Fiorino (1990:227) says that administrative officials and scientific experts, with guidance from elected representatives, are often considered more capable of making risk decisions than the general public. Plough and Krimsky (1987:6) and Otway (1987) describe risk communication as “how experts inform others about the truth.” But Fiorino (1990:27-28) cites compelling substantive, normative, and instrumental arguments that challenge this technocratic orientation.

Danger and risk are communicated synonymously in everyday language, usually indicating some unfortunate event (Ewald 1991:199). For instance, we could either say it is risky or dangerous to jump from an airplane with a poorly packed parachute, and the meaning would be the same. But the environmental sociologist Gene Rosa (1993:64) clearly distinguishes the perception of danger from the perception of risk: “Danger comprises elements of the world that threaten humans in some way. Risk is recognition of danger.” Unlike Giddens and Beck, who distinguish modern industrial risks from earlier risks from natural disasters, prompting a more technological response, Rosa argues that risk is a response to any kind of hazard, natural or anthropogenic. He argues that there is no one-to-one correspondence between hazard, which he conceives as an ontological reality, and risk, which he conceives as an epistemological construct, because cultural social activities intervene between the two. He recognizes certain conceptual, logical, and epistemological difficulties of this formulation, but suggests that it is useful to the extent that it “focuses our perceptions within a common frame of reference.” Mary Douglas (1992:31-32) observed that when risk is associated with decisions made at the level of the individual, as do psychologists in what she characterizes as ‘the innocent model,’ there is an assumption that if a misguided public only had more information regarding the probability of a

particular unfortunate event, that public would make better decisions. But Douglas argues that the conceptualization of risk involves more than an assumption that an actor will make a rational decision, given the technical probabilities of alternative outcomes (1992:51). She argues that risk analysts employed by corporations and governments should realize the inadequacy of basing risk merely on the probability of harm (1992: 44). She says that “instead of isolating the risk as a technical problem we should formulate it so as to include, however crudely, its moral and political implications (1992:51). Douglas advances the thesis that risk is a collective construct. “Risk should be seen as a joint product of *knowledge* about the future and *consent* about the most desired prospects” (Douglas and Wildavsky 1982:5, original emphasis). Rosa’s and Douglas’s arguments for a collective social and cultural intervention between hazard and risk justify the core of the model for the present research.

Mythen (2004:21) notes that prior to the Enlightenment, people perceived danger as unavoidable. In contrast, Ulrich Beck (1992:20; 1995b: 78), argued that the contemporary world is in fact an alarmingly dangerous place, but one in which people are more concerned with avoiding “social bads” than in acquiring “social goods”, the goal in earlier times, at least in the Eurocentric world. Beck says that the capitalistic development of “manufactured risks”, along with its fabricated (or “manufactured”, in Giddens’ (1991:4) account) uncertainties (Beck 1992:19), generates an individualization of risk, which is to say that the avoidance of “social bads” is privatized, so as to bypass collective responsibility, and institutions then cease to be the guarantors of public safety. Beck’s argument for capitalism’s unintended but destructive production of environmental risk is compelling, but in his focus on manufactured risk, his argument that danger is natural unnecessarily narrows its scope. Slovic (1999) similarly argues that danger is an ontological reality, whereas risk is an epistemological construct. Luhmann

(1993:26) makes the case that people tend to minimize the risk posed by a natural disaster, such as a catastrophic meteorite strike, because nothing can be done to prevent it. My opinion is that there is nothing to gain by separating natural from anthropogenic hazards, particularly as natural and built environments become indistinguishable (Callicott 1989; Capra 1975:77; Naess 1989:63), because any kind of hazard can pose a risk. Furthermore, I argue that danger is an epistemological construct, the outcome of a contentious social process, superimposed on a fundamental ontological reality.

Beck, Douglas (1992; Douglas and Wildavsky 1982), and others (Bradbury 1989; Renn 1992a; Rosa 1998; Strydom 2002) argue that risk is a social construction. Andrews (2012) offers a recent general review of social constructionism, arguing that it is an epistemological rather than an ontological perspective, since it is concerned with the construction rather than the discovery of knowledge. For the social construction of risk, Strydom (2002:87) says the ideal is “a theoretically sophisticated social scientific understanding of risk that gives prominence to its social construction without losing hold of its reality.” He cites Giddens’ (1991:117, 137) recognition that risks are “faced collectively since they affect virtually everyone.” (Strydom 2002:83). Douglas expresses a similar position: “individuals transfer their decision-making to the institutions in which they live (1992:78), adding that “the problems of risk are essentially political” (1992:79). Renn (1992:71-72) argues that risk policies should be based on inequities, unfairness, and, to some extent, should account for the perception of incompetence. So we should expect that both the public and government/industry would express these social and cultural factors to inform both danger and disruption on the path toward the construction of risk. However, the expectation does not always match the reality, as when a utility infrastructure developer acknowledges inequality only through its exploitation. Furthermore, Renn (1992:56)

says that risk-exposed parties should make causal connections between hazards and risks and seek to avoid the undesirable effects of hazards. This feedback into the framing of a hazard (what the DHS Risk Lexicon (2010: 32) would call “risk reduction”) is indicated by amplification and attenuation loops.

Risk reduction, according to the DHS (2010:32), “can be accomplished by reducing vulnerability and/or consequences (damages.)” Toward this end, Wilkinson (2010:71) says that risk studies must pay attention to “the socio-demographic characteristics of their sample groups” so investigators can begin to understand the contingent factors that differentiate between the views of experts and publics. When this begins to happen, publics enter Beck’s “post-national risk community” (1999:16), that is, “a technical political community aware of its vulnerability or even victimization by high technology and the need for a more democratic governance of technology is in the process of emergence.” (Strydom 2002:131).

The impact of a new generation of environmental dangers is, according to Beck ([1986]1992: 36), “democratic,” exposing all to air, water, and other kinds of pollution. He says that the distribution of wealth no longer tracks the distribution of risk (Beck 1986:48). However, though it is true that the advantaged classes are still exposed to risk, environmental justice scholarship, with its roots in the civil rights movement, building especially on the work of Robert Bullard (1990), contends that the deck is still disproportionally stacked against communities characterized by race or ethnicity (Bullard and Wright 2009; Pellow 2018), low income (Bodenhamer 2016; Jerolmack and Berman 2016), and indigeneity (Kuletz 1997; Whyte 2017), both domestically and in the Global South (Faber 2008; Klein 2014).

Much recent social science research exposes the burden that powerful industries and state actors impose on vulnerable publics. Mining (Kuletz 1997), manufacturing , from production to

waste disposal (Markowitz and Rosner 2013), and agricultural industries are among the sectors most likely to abuse their economic and political power. Studies document the toll on human and natural environments in the mining and mineral industries, including coal (Bell 2016), uranium (Cable et al. 1999; Cable et al. 2008; Kuletz 1997), natural gas (Jerolmack and Berman 2016; Malin 2014) and natural gas liquids (Ostrander 2013). Environmental justice researchers recognize that contemporary understandings of vulnerability (for review see Kelman et al. 2016), resilience (for review see Alexander 2013; Manyena 2006), and collective stress (Barton 2005) are associated with both physical and social location (Cutter et al. 2003; Cutter and Finch 2008; Dow and Downing 1995; Rootes 2004), and are often intersectional (Fordham et al. 2013; Malin and Ryder 2018), with unequal impacts that implicate race (Brulle and Pellow 2006; Bullard [1990] 2000; Bullard and Wright 2009; Cutter et al. 2003; United Church of Christ 2007), class (Harrison 2011), gender (Bell 2016; Kaplan 1997; McHenry 2017), and deep cultural rootedness (Hummon 1992). Their interests are understandable, given the twin goals of ecological and social justice that motivate the environmental justice movement (Harvey 1996:387).

One aim of the present research is to interrogate the causes and consequences of differential exposure to risk as it is manifested in physical or geographic location. I am particularly interested in the forced choices that are the inevitable outcome when people's relationship to the land has been manipulated by outsiders. This research specifically examined the tradeoff between the physical proximity to a known harm and the potential for economic gain, whether through employment or by selling an easement to the pipeline developer. Even though, from Beck's 'risk society' perspective, we are all exposed to the effects of climate change and pandemics, modern environmental justice scholarship argues that the burden of exposure to risk is not equitably distributed among all communities. Displaced masses lacking resources are often forced to

migrate toward spatially vulnerable environments (Faber 2008:205), while some categories of people have no choice but to remain in unsafe environments. Curran (2017:309) argues that they are outbid in the competition for escape routes from natural or human-induced sources of harm.

This discussion of key concepts in the study of risk recognizes the need for what Mary Douglas (1990:1) called a “forensic vocabulary” capable of holding risk-exposing and risk-exposed parties accountable. Otway and Thomas (1982) long ago recognized a fundamental bifurcation in the conceptualization of risk: one based on the physical attributes of hazards (explainable, predictable and controllable through technology), and one based on social and cultural attributes (involving the subjective, value-laden assessment of risk identification and risk estimation). Seeing this conceptual bifurcation, Wynne (1980:182) argued that the objective activities by which risk is identified and estimated must be integrated with the subjective activities by which risk is evaluated. Rayner (1992:94-95) similarly argued that “the public does not care much about probabilities in choosing between two courses of action when the differences in probability are as small as they are in most of the risk management decisions that policy makers now face”, and suggested that the constituent public cares most about trust, liability, and consent. Risk then can be viewed as a subjective assessment of threats, either actual or potential, to well-being (Lifshitz et al. 2016). Despite the difficulty in fulfilling this need for a forensic vocabulary of risk, and despite recent complications to risk theory that recognize the presence of unknown, uncertain, and unknowable knowledge (Beck 1999; Giddens 1999; Luhmann 1998, Strydom 2000), the political effects of risk force an effort to specify a conceptualization of risk that is both subjectively just and objectively defensible.

Since this research describes a project that many property owners consider to be potentially harmful, it is important to understand the theorization of what it means for a condition to be a

hazard. Kathleen Tierney (2019:6), defines a hazard as an ongoing condition that has the potential for becoming a disruptive event. A hazard then has the potential to disrupt normal social functions and structures. For some property owners interviewed in this research, the pipeline project remains a hazard, following this definition, such as when they speculate on the likelihood that the pipeline will explode. For others, the pipeline is a disaster, because the potential for disruption has been realized, as when damage has already been done to water or wildlife. In the discussion section of this research, there is then a theoretical justification for a linkage between property owners' recollection of a condition that had the potential to disrupt normal social functions and structures. Whether the Mountain Valley Pipeline project is described by property owners in terms of a hazard or a disaster, its social nature is revealed by evidence that certain social categories are differentially and sometimes intersectionally impacted. Hurricane Katrina illustrated such differential and intersectional impacts by race, class, gender, age, and ability (Bevc, Nicholls, and Picou 2010).

Perry (2018:8) recently reiterated a classic distinction by Burton, Kates, and White (1978) that "a disaster is viewed as an extreme event that arises when a hazard agent intersects with a human use system." The social orientation of the disaster concept has continued to strengthen (Cutter 2001; Kreps and Drabek 1996; Mileti et al. 1999; Quarantelli and Dynes 1977; Tierney and Oliver-Smith 2012), even as our understanding of its causes and consequences have become more complex, with important advances distinguishing natural from technological disasters (Couch and Kroll-Smith 1985; Erikson 1994; 1985; Freudenburg 1997; Gill and Picou 1998). Whatever the cause, there are always social consequences. Subsequently Cutter (2005:39) argued that the disaster event is less the issue than human vulnerability and resilience in the face of extreme environmental events.

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Gill and Ritchie (2018:57) recently argued that there is a “need for a basic methodological shift beyond strictly event-driven research and analysis of human responses and impacts to look at pre-existing social structures and processes that generate vulnerabilities and influence resilience.” Extending this argument to the potentially harmful effects of utility production and transmission projects, there is evidence that this research shift is occurring with investigations of utility grade wind (Burningham et al. 2015; Devine-Wright 2009; Jacquet 2012), mining (Malin 2014), oil (Malin et al. 2017), and especially natural gas (Alcorn et al. 2017; Bugden et al. 2017; Clarke et al. 2015; Evensen et al. 2014; Jacquet 2012; Jerolmack and Walker 2018; Malin 2014, 2017; McHenry 2017; Whitton et al. 2018).

Opposition to utility infrastructure projects, as a subset of the more general opposition to all hazardous environmental activities, has been studied from the perspective of place-protective practices (Bugden et al. 2017; Devine-Wright 2009; Devine-Wright and Howes 2010; Raymond et al. 2010) and the recognition of uncertain social and economic outcomes (Graham et al. 2015:

1782; Mason et al. 2015; Rootes 2004). Hoberg (2013) presents evidence that government actors are aware of general public opposition to pipelines. The consciousness of individuals whose circumstances cause them to recognize the harmful effects of an environmental activity may be transformed by what McAdam (1982, 1988) calls “cognitive liberation,” but this process can be curtailed by ideologies that work to maintain the status quo (Bell 2016; Bell and York 2010). When communities choose to support or at least tolerate an environmentally risky land use, research suggests the inverse “not-in-my-back-yard” decision is made on the basis of economic necessity (Boudet et al. 2016; Jacquet 2012; Malin et al. 2017; Mason et al. 2015), coercion by industries (Boudet et al. 2016), distance from the polluting source (Batel and Devine- Wright 2015; Brauhnoltz 2003; Johnson and Scicchitano 2012)) and/or ideologies that have been described as rural, conservative, libertarian, patriotic, and/or individualistic (Boudet et al. 2014; Clarke et al. 2016; Gravelle and Lachapelle 2015; Jerolmack and Walker 2018)

A review of the range of environmental hazards

If risk is the outcome of an objectively and subjectively negotiated process that determines accountability, hazards are events that have the potential for harm (Drabek 1997; Pearce 2000; Tobin and Montz 1997). Or as the British Medical Association (1987:13) says, a hazard is “a set of circumstances which may cause harmful circumstances.” A disaster, according to common usage, occurs when the potential for harm to human interests is actualized. Beck (1995b:91) says that “hazards are subject to historico-cultural perceptions and assessments which vary from country to country, from group to group, from one period to another.” Nick Fox (1999), reflecting on ways that risk can be distinguished from hazards, says that an emphasis on accountability, as in the first sentence of this section, suggests that if it is assumed that there is a real and material connection between an underlying hazard and a risk, accountability is a matter

of blaming the entity which has the potential to cause harm. A second model of the risk/hazard opposition is based on the argument that hazards are natural and value-neutral, whereas risk is the human response to hazard. This model has a tendency toward blaming the victim who has not responded appropriately to a hazard, rather than the hazard itself. Fox suggests a third, postmodern position, in which a risk perception produces a hazard. As Wells (1996:6) describes it, the identification of a hazard results in its materialization. A conservative version of this reversal of the traditional flow of causality would be endorsed by evidence of feedback loops. Beck (1998:19) argues that within the organized irresponsibility of modern institutions, technology itself uncontrollably *produces* a “social explosiveness of hazard.” In such an uncertain society, the gap between knowledge and the impact of runaway hazards can be exploited by both government and industry, on the one hand, and by the public on the other, each for their own purposes.

The DHS Lexicon (2010:17) makes a fundamental distinction between a hazard and a threat, defining hazard as a “natural or man-made source or cause of harm or difficulty,” but whereas a hazard is not directed toward a specific entity, a threat is intentional. So, it would be appropriate to refer to a terrorist attack as a threat, but a natural gas pipeline would be a hazard, because the intent is to generate a profit rather than harm. Fox (1999:19) argues that nothing can be hazardous until it is recognized as such. The recognition of risk thereby transforms the potential source of harm into a hazard when a discourse establishes that it has ‘hazardous characteristics’ (Wells 1996). If it is established that the potential for harm is zero or close to zero, there is no hazard. But who decides if something has that potential? Wynne’s (1992:276) approach is to dissociate himself from “the bipolar notion that the wisdom of the people is pitted against the brittle knowledge of the experts.” His earlier work (Wynne 1980) established the link

between conflicting claims regarding risk and the public's trust in institutions, following Garfinkel's (1963) earlier connection between trust and the viability of institutions. Wynne (1992:276) argued that trust requires an acknowledgement of underlying assumptions and incomplete knowledge by *both* experts and publics. This is consistent with the reflexive turn in the sociology of knowledge, championed by Gouldner (1970) and others. A resolution to the conflict between pipeline developers and anti-pipeline activists may require a mutual acknowledgment that the determination of whether the pipeline constitutes a hazard is caught up in issues of trust and what Grinyer (1995) describes as the competing claims of lay actors' "expertise" and the "expert knowledge" of professionals.

The discussion so far hopefully justifies a reservation toward asserting a definitive taxonomic differentiation of hazards. Even the basic distinction between natural and anthropogenic hazards is suspect, because, as Beck, Giddens, Luhmann and others argue, contemporary risks are, as Halfmann (1988:14) says, "universal, global and irreversible." From another angle, Haraway (1985, 1991) argues against the idea of a fixed boundary between humankind and nature. Goldblatt (1966:12), following Beck, argues that "conventional models of modern society cannot capture their [environmental danger and risk] origins or consequences." This insight may be recognizable to landowners in the path of a hazardous substance pipeline, who see no distinction between the human and natural environments. Harvey (1996:128) presents historical evidence that the idea of a separation between humanity and nature would have, prior to about the 18th century, been "quite extraordinary to preceding generations." Harvey (1996: 134) cites Heidegger's complaint that Nature has become "one vast gasoline station" for human exploitation. This sort of insight underlies much criticism of thinking that connects "natural" with "resource", such as Shiva's (1989) argument that women, like

nature, are dominated as a resource. Anthropogenic hazards, caused by human action or inaction, can, for example, be categorized into public concerns with water pollution, damage to rainforests, depletion of natural resources, air pollution, damage to the ozone layer, species loss, and climate change (Staggenborg 2011:105), but also categorized more generally, such as Goldblatt's (1996:26) four-point typology of impacts: change in population levels and geographical distribution of plants/animals/micro-organisms; alteration of soil and geological forms; alteration of chemical composition; atmosphere, water systems and life-forms; and alteration of biological systems: meteorological, carbon, nitrogen, hydrological, food webs, and ecosystems. There is considerable interaction associated with "natural hazards," originating in atmospheric, hydrologic, oceanographic, volcanologic, seismic and neotectonic systems, covered in the academic literature by the journal *Natural Hazards*. For the present research, the above discussion justifies an approach that it is resistant to categorization of hazards that ignores the profound interaction among all manner of anthropogenic and natural hazards. However, this is precisely what has been done throughout Section 4 of the Environmental Impact Statement for the Mountain Valley Project and Equitrans Expansion Project.

The spatial and temporal interaction between humans and the natural environment suggests an approach that distinguishes between point sources and linear sources of pollution. An oil refinery is a good example; its pollution emanates, for simplicity, from a single point that produces water, air, noise, and light pollution. Despite its cost to the environment, it exists in a tradeoff with its benefits by providing a steady source of jobs, according to proponents (Driessen 2013), and tax revenue. However, Skinner and Sweeney (2012) say that in the case of the Keystone XL pipeline, the creation of jobs is overstated. Jobs in the unconventional oil and gas extraction industry (UOGE), which are located around a point source, tend to go to non-local

workers (Wrenn et al. 2015). This research is designed to elicit landowners' opinions about whether pipeline workers, in a linearly oriented industry, are similarly non-local. A linear source of pollution represents an alternative geometry, with its own peculiarities, such as might be encountered with the noise and air pollution generated by a highway. Environmental scientists have studied the distinction between these two types of pollution (U.S. Clean Water Act, U.S. Code Title 33, section 402(p)) , but the literature has little to offer about its adaptation to utility-scale energy projects, some of which are point sources of risk, like a coal mine, gas or oil field, or power-generating facility, and other of which are linear sources of risk, including the electric grid and oil and natural gas pipelines.

Danger and disruption to sense of place in the context of vulnerability

If hazards are events that have the potential for harm (Drabek 1997; Pearce 2000; Tobin and Montz 1997), the arguments of theorists referenced earlier in this review suggest that danger and disruption to sense of place are two potentials for harm that specifically characterize the harm posed by a hazardous substance pipeline. These two types do not necessarily exhaust all of the ways a population might characterize this hazard, and they do not presume to be present for other kinds of hazards. A major question posed by this research is whether or not danger and disruption will emerge from the data as important influences in the process by which the hazard produces a collective perception of risk. As Carmin (1999) notes, local environmental activists are often able to identify such potentials for harm. Brulle (2000:101) suggests that environmental movements are able to mobilize a variety of symbolic and material resources, of which these sources of harm would seem to be one type. These are then available to both local and to national environmental movement organizations such as the Sierra Club or Greenpeace to strengthen their legal arguments (Rootes 2004:616). I claim that both danger and disruption to sense of place are

such symbolic resources that are available in the construction of risk. Douglas (1992:47) argues forcefully that danger can be used by a culture as a bargaining weapon in the formation of risk, which she argues is always political. Goldblatt (1996:12), following Beck, says that in modernity there are “pervasive and historically unique levels of environmental danger and risk of such magnitude and form that conventional models of modern society cannot capture their origins or consequences.” Goldblatt (1996:97) contends that environmental politics sometimes succeeds in putting a brake on environmental degradation. The interviews conducted during this research will scrutinize whether danger and/or disruption to sense of place are associated with the recognition of a distinctive place identity, separate from such categories of social identity that are based on race, gender, age, or occupation. If place identity is a distinctive form of identity, it will support an argument by Twigger-Ross et al. (2003), but if not, it will support a counter-argument that place identity is just one part of social identity (Bernardo and Palma-Oliveira 2012).

The approach taken by this research is that sub-populations in a particular geographic area may have significant differences in vulnerability due to differential exposure to danger and disruption. This builds on the hazards-of-place model developed by Susan Cutter (1996) and associates (Cutter et al. 2003:242) based on the fundamental position that “vulnerability to environmental hazards means the potential for loss.” Cutter’s model distinguishes between the biophysical and social vulnerabilities associated with a specific place or region. Cutter and associates (2003) developed a broadly used vulnerability index based on principal component analysis for the determination of relevant socioeconomic and demographic factors. The present research follows the hazards-of-place model and distinguishes between biophysical and social vulnerability in response to a charge by Kaspersen and associates (2001) that “What is essential is to assess vulnerability as an integral part of the causal chain of risk and to appreciate that

altering vulnerability is one effective risk-management strategy.” Brooks (2003:4) provides a conceptual framework that, like Cutter’s model, subdivides vulnerabilities by arguing for a distinction between social and biophysical vulnerability. These vulnerabilities must be specific to a particular hazard at a particular place and time (Brooks 2003:9).

The present research recognizes that a hazard involves the potentiality for loss, as in the Cutter model, but substitutes ‘harm’ for ‘loss’ to more clearly include nonmaterial aspects of danger and disruption. The United Nations International Strategy Disaster Reduction (UNISDR 2004) defined vulnerability as “the conditions determined by physical, social, economic and environmental factors or processes, which increase the susceptibility of a community to the impact of hazards.” This broad range of harms that may constitute the impacts of hazards include all the properties of a system that mediate the outcome of a hazard (Brooks 2003:5). Cutter (2003: 245-249) enumerated a wide range of social vulnerability concepts and metrics that may apply to a specific hazard, and then used a wide range of variables from U.S. Census information to find eleven factors that underlie social vulnerability, irrespective of specific environmental hazards. “Harm” in these enumerations has the benefit of being a more inclusive concept than “loss.”

Hu et al. (2019:163) more recently continue to define vulnerability as “the potential for loss or the state of susceptibility to harm by exposure to stresses,” and consider it an important concept for assessing the presence of a hazard. The Hu et al. case study compares the spatial vulnerability of civilian aviation and subway systems in China. But whereas disaster risk management may involve considerable spatial planning to minimize the vulnerability of a population (Greiving et al. 2016), as in the case of a planned airline runway, Cutter et al. (2008:599) focus more directly on the connection between people and places by defining

vulnerability as “the pre-event, inherent characteristics or qualities of social systems that create the potential for harm.” This recognition of the preemptive characteristics of resilience is echoed in Oxfam’s (2013:8) definition of resilience as “the ability of women, men, and children to realize their rights and improve their well-being despite shocks, stresses, and uncertainty” These characteristics of impacted people and places are basic to my assessment of vulnerability and central to the study. Blaikie et al. (1994) and Hewitt (1997) assume vulnerability is a social condition, which is to say that it measures societal resistance or resilience to hazards. The study may reveal evidence such as reviewed by Rootes (2004), which provides support for the argument that environmental injustice disproportionately impacts less affluent members of a society. Such characteristics precede the hazardous event. This differential impact can result in what Beck refers to as the “social explosiveness of hazard” in *Ecological Politics* (1995b). Goldblatt (1996:178) similarly argues that “the susceptibility of individuals to hazards—for example, asthma in children resulting from local air pollution—is a vulnerability associated with some kinds of environmental hazards. Dow and Downing (1995) define vulnerability in terms of the differential susceptibility to a hazardous circumstance and include not only social factors but also wider biophysical, economic and other measures. Cutter and associates (2003:243) recognize that differences in social vulnerability are partially the product of age, race, health, income, and type of residence, but also the result of place inequalities, in the development of their approach to environmental hazards. Rurality, with its limited rates of growth and economic vitality, is among an array of characteristics of communities that can contribute to social vulnerability. The proposed research draws on theories of place to extend the understanding of how attachment, identity, and dependence on place can create inequality when located in the path of a hazardous substance pipeline. As of 2003, at least, Cutter and associates say that “there has

been little research effort focused on comparing the social vulnerability of one place to another.” The distinctive qualities of place associated with rural Appalachia may allow such comparison.

The stress of danger or disruption imposes vulnerabilities that are both social and biophysical. Shared understandings of vulnerabilities influence how groups adapt to the potential for harm imposed by a hazard. This perspective is an application of a conceptual framework introduced by Brooks (2003). Social vulnerabilities exist prior to a hazard. They include such factors as poverty, inequality, marginalization, and access to services (Blaikie et al. 1994). A biophysical vulnerability, on the other hand, is associated with the probability and severity of a hazard’s occurrence (Brooks 2004:4). So the biophysical vulnerability associated with the danger of a natural gas pipeline has a low probability, but a high consequence. The biophysical vulnerability of a disruption to sense of place, on the other hand, has a high probability, but is of relatively low consequence. This understanding of vulnerability is central to the conceptual framework of this research.

Cutter provides further insight with reviews of three theoretical orientations to vulnerability associated with environmental hazards: vulnerability as a pre-existing (source) condition, as a tempered response (including resilience to hazard), and as a hazard of place (a geographically differential exposure to a hazard). Cutter (1996: 537) argues that vulnerability in the first orientation is a social predisposition to a potential harm, and much of the vulnerability conceived as a response to hazard is also socially constructed. Cutter argues that the third perspective is more geographically centered. I argue that social vulnerability, as a potential, is usefully distinguished from the biophysical vulnerability associated with hazard in a specific geographic space, because it allows a clear theoretical understanding that the consequence of living in, for instance, the blast zone of a hazardous substance pipeline, may be different from

the consequences for a population living away from the blast zone. Socially constructed understandings of differences in vulnerability may influence the individual and collective perception of risk and differentially push populations toward differing support for contending groups. This finding would support a suggestion (Cutter et al. 2000:733) that the hazardousness of a place must consider both social susceptibility (which I equate with social vulnerability) and physical exposure (which I equate with biophysical vulnerability). Mustafa et al. (2011) developed what may be a useful quantitative vulnerabilities index with a version for rural contexts at a local scale. It can measure differential vulnerability for both rural households and rural communities, unlike other measures (Martín et al. 2017) that seem more useful for measuring regional differences, and the wide generality of the Cutter model.

Batel and Devine-Wright (2015:17) emphasize the importance of connecting different meanings to specific social identities. In the proposed research the meaning of “danger” and “disruption to sense of place” may be given meaning for specific social groups, depending on their physical or social location, as “animating grievances” (Snow and Soule 2010:53) that provide a new way to predict a public’s attitude toward a contentious environmental project.

C. Support for and mobilization into social movement organizations

Classical and contemporary approaches to mobilization

The proposed research seeks a clearer understanding of factors that connect hazard to perceived risk, specifically factors that link a natural gas pipeline to risk-related attitudes toward that pipeline. The motive for seeking this clearer understanding is that risk then becomes a more powerful resource available to contending groups. So, it is important to recognize how social movement organizations attract support for and mobilization into movement activity. This is a question that has concerned social movement theorists since at least as far back as the 1960s.

McAdam and Snow (2010:1), McCarthy and Zald (1977:1217-18), Meyer (2015:11); Snow and Soule (2010:6) and Tarrow (1998:4) describe essential characteristics of social movements that when combined suggest that a social movement is a conscious, concerted, and relatively sustained effort by an organized group of ordinary people to change some aspect of society by extrainstitutional means. For about the last fifty years theorists have unpacked parts of this definition. Doug McAdam's (1982) experience with the civil rights and later movements led him and others (Tarrow [1994] 2011; Tilly 1978) to focus on the political processes that characterize the course of social movements. Their research led them to argue that mobilization is most likely when there are favorable political opportunity structures, with access to resources and a compelling injustice frame. A clearly derived conceptualization of perceived risk may be just such a resource. Tarrow (1998) has argued that opportunities are best characterized as situational rather than structural, a perspective more recently advanced by McAdam, Tarrow, and Tilly (2001) in their influential *Dynamics of Contention*. Their emphasis on the interaction of contending groups is recognized by the availability of risk perception as a resource for those groups. Snow and Soule (2010:23) argue that populations will mobilize when they are aggrieved, through fear, indignation, resentment, or moral shock. Danger and disruption, having the potential for harm, are stresses that, when tempered by vulnerability and in the presence of reduced capacity for resilience, combine these kinds of grievances into risk. Snow et al. (1998) develop the idea that disruptions to routine or "quotidian" functioning or expectations can generate an escalation of grievances. I argue that potential harm and the loss of property owners' sense of place are two such quotidian disruptions. This then focuses on the dynamic interaction of contending groups rather than on the characterization of movement structure. McAdam, Tarrow, and Tilly emerged from a structuralist perspective, but more recently they recognize

“the necessity of taking strategic interaction, consciousness, and historically accumulated culture into account.” (McAdam et al. 2001:22). I contend that a dynamic, process-oriented account of support for and mobilization into movement collective identity can more clearly capture the essential elements of confrontations between contending groups.

Snow and Soule (2010:37) say that one “category of quotidian disrupting events includes intrusions into or violations of culturally defined areas of privacy and control, such as community space, by strangers or outsiders. The present research extends this category to include disruption to residents’ identification with, attachment to, and dependence on the places where they live. The idea of disruption as it applies to place will be discussed below with reference to theorizing by Devine-Wright (2009) and Fried (2000). Just as Cable and colleagues (Cable et al. 1999; Cable et al. 2008) exposed the tactics and strategies by which government and industry suppressed knowledge about the nuclear industry’s damage to the human and natural environments, residents of counties endangered and disrupted by a natural gas pipeline are the public’s canary in the coal mine.

Snow and Benford (1988) introduced the framing perspective as an analytical tool for the study of social movements. Derived from Goffman’s (1974) *Frame Analysis*, it generated a flood of new concepts that recognized that individuals, interacting with other individuals, mobilize for movement participation by pursuing core framing tasks that diagnose a problem, propose a solution, and call for corrective action. Gamson (1992a, 1992b) proposed that an injustice frame is one type of diagnostic frame, certainly a strategic framing concept for the environmental justice movement. Frame bridging (Benford and Snow 2000:624), such as when veterans and Native Americans found common ground at Standing Rock, may be evident among pipeline communities that may share a strategic goal despite other differing values. Frame amplification,

which taps into cultural values, narratives, and folk wisdom, may be particularly evident in respondents' descriptions of their rural Appalachian heritage, as a specific case of what has previously been identified as risk amplification. Ryan (1991) argues that contending groups engage in frame contests, which are contests between frame sponsors with opposing stories. The differential framing of risk by contending groups can be organized using this kind of vocabulary, with some reservations for the overuse of framing concepts (D'Angelo et al. 2019).

The cultural turn of the 1980s drew researchers back to the micro level of analysis. Along with the framing perspective, emotions and collective identity (Taylor and Whittier 1991) became the subjects of analytical inquiry. Prior to the 1990s a generation of social movement researchers had been reticent to consider emotions (for reviews see Goodwin, Jasper and Polletta 2000, 2004, Van Ness and Summers-Effler 2018), since they erroneously assumed emotions are irrational, and wished to distance themselves from crowd theory that questioned the rationality of collective behavior. More recent researchers (Hunt and Benford 2004; Melucci 1995; Taylor and Whittier 1992) argue that most emotions do not encourage irrational acts, particularly relative to strategic errors or erroneous information, and can provide important insights into all phases of the movement life cycle. Indeed, emotions may serve important strategic functions (Groves 2001; Whittier 2001). For example, the micro-ritual process described by Collins (2004) explains how group solidarity can result from feelings of co-presence, exclusion of outsiders, and mutually held symbols of group membership. In another example, the indignation felt upon the occurrence of an unexpected event may trigger a collective moral shock (Jasper and Poulsen 1995), even in the absence of a pre-existing network. And Brockett (2005) describes how the ill-treatment of protesters can result in the recruitment of bystanders, and the presence of a target for blame can generate bonds of collective identity (Nepstad 2004). These examples demonstrate the

value that recognition of emotions serves in complementing classical political opportunity and resource mobilization perspectives.

Contemporary studies of social movements also make extensive use of the concepts of networks and collective identity. Diani (2004:341) writes that early social movement researchers (McCarty and Zald 1977; Tilly 1978) recognized that social activists of the 1960s and '70s were "rich in relational resources." This insight justifies the inclusion of inquiries into the social networks of landowners in the path of the pipeline, as a source of resilience. Research by Snow and associates (1980) demonstrated that among certain groups social networks account for 60 to 90% of the adhesion of members to an organization. Pre-existing direct ties to movement participants, particularly when they are widely distributed and dense, may facilitate recruitment (McAdam 1986; Nepstad and Smith 1999), but they are not an essential precondition for movement involvement (Kriesi 1988; McAdam and Fernandez 1990; McAdam and Paulsen 1993). Organizational ties are often more important than direct ties. Diani (2004:342) cites studies in which "embeddedness in social networks not only matters for recruitment, but also discourages leaving, and supports continued participation." Networks matter, if only because they allow the calculation of a person's contribution to collective goals (e.g. Gould 1991, Kim and Bearman 1997). Diani (2004:347) suggests that "collective action then results from an iterative, interdependent process, not from individual decisions." Such collective action often occurs in the form of a social movement organization, which Snow and Soule (2010:151) say may be a formal organization or may be a loose association of individuals "who have come together because of a shared goal concerning one or more grievances." The conceptual framework for the production of risk by a hazard proposed for my research suggests that such an

iterative process within some form of social movement organization could develop as an extension of a collective recognition of a community's perceived risk.

Gould's (1991, 1993) research on contacts between Parisian neighborhoods during the Commune uprising in 1871 illustrates the importance of group level network connections and collective action. Interactions among allied social movement organizations and between SMOs and contending groups are central to the study of collective action. Whereas earlier political process theorists such as McAdam, Gamson, Tilly and Della Porta targeted the state as the focus of social movement goals, with the idea that policy change is the main avenue by which social inequality is addressed, a more recent focus by New Social Movement theorists (e.g. Melucci 1989; Touraine 1981) is on the production of knowledge, where cultural change is the primary goal (Armstrong and Bernstein 2008:77). The goals of the feminist and environmental movements, among others, make little sense when analyzed within a political process theoretical framework (Polletta 2006), because they tend to marginalize movements that target society rather than the state (Armstrong and Bernstein 2008:80). These new movements reflect a postindustrial emphasis on knowledge rather than material goods, focusing on the ability of social movements to challenge dominant ideologies, and recognizing that the state is not the only source of authority. Social movement organizations that can promote claims in contestations over meaning are then in a powerful position to change policy (Naples 1997; Smith 1987, 1990). This study argues that the social construction of risk illustrates such a claim, which is then available as a resource that can challenge a dominant ideology. That construction entails the identification of contradictions in the logics or narratives of an opposing group, which can then be used to forge solidarity among activists and sympathetic publics (Featherstone 2012:5). Featherstone (2012:10) speaks of "overlapping communities of resistance", such as might be

found among pipeline resistance groups. The state would like protesters to look inward and see their grievances as local, rather than looking outward and seeing them as part of an international political activity, because looking outward gives protesters a broader form of solidarity.

Collective identity is forged through shared meanings and values, often recognizable as a process of framing (Snow and Benford 1992) that can provide support for and maintain movement participation. Networks similarly use formal and informal ties to mobilize additional cultural resources (Klandermans 1990). This investigation uses these microsocial perspectives of framing, collective identity, and cultural values to describe the process by which a hazard produces a risk. It is a micro-level illustration of how a community at risk may or may not construct movement solidarity, collective identity and transformed consciousness (cognitive liberation) in a micromobilization context (McAdam 1988).

Resistance, acceptance, quiescence, and acquiescence

Social movement organizers acquire political power through the recruitment and mobilization of individuals sympathetic to their cause. Power is here generally understood by reference to Roscigno (2011:353) as “an unequal relation, or inequality, based on personal attributes, institutional positioning and statuses that are defined, codified and acted upon within historical and cultural contexts.” This study examines social dimensions within which power inequality may or may not lead people to support organized dissent. Landowners and sympathizers in this case study typically recognized that a power inequality exists between them and pipeline developers and landowners. Pipeline developers often prevail in decisionmaking as they bring their superior resources to the bargaining table. Recognition of that power inequality is sufficient to establish the motivation behind those who resist a project perceived to be incompatible with their interests. Beyond that basic dichotomy, which differentiates the

oppressor from the victim, Steven Lukes (1974) argues for a second and third dimension of power. Briefly, the second dimension of power requires that the oppressor mobilize perspectives that result in decisions or strategic non-decisions that are favorable to its biased interests. Coercion occurs through intimidation, exclusion, the threat of sanctions, or the manipulation of symbols. The “Friends of Coal” initiative is an example of this latter strategy. It uses such methods of control as appeals to patriotism, protection of “traditional” family values, the maintenance of masculine identity, and the protection of national interests (Bell and York 2010). Exploitation is possible to the extent that there is suppression of dissent. Lukes’ third dimension of power is manifested when the powerless compensate for their lack of control by internalizing the values, rules, and beliefs of the power elite. When the third dimension of power is fully actualized, dissent and even political participation cease to have social meaning. The power elite is then free to manipulate the masses for its own interests, with no fear of challenge from a society that has been silenced. This perspective has roots in Gramsci’s (1971) conceptualization of hegemony.

John Gaventa (1982) used Lukes’ explication of the mechanisms of political power to inform his study of power inequality in the Central Appalachian Mountains, near the intersection of Kentucky, Tennessee, and Virginia. It is a region marked by poverty amidst tremendous natural wealth. And yet Gaventa was struck that “the inequalities do not appear to have prompted major challenges from those deprived” (1982:36). Inaction is often the result of indifference, as corroborated by our previous research (Bell et al. 2022:5). However, as Shriver, Adams, and Bray (2019) and others recognize, inaction does not necessarily indicate indifference, even in the face of mechanisms imposed by elites to enforce or reinforce their legitimacy. Inaction may also manifest in either quiescence or acquiescence.

A number of theorists have contributed to the analytic distinction between quiescence and acquiescence. Gaventa (1980:25), tracing the roots of quiescence, recognized that the ‘hidden’ aspects of power may be methodologically difficult to disentangle in an empirical situation, so it is no surprise that observation is sometimes problematic. He reviewed a number of factors, such as low income, low education, and low status that suggest why Appalachian groups persistently fail to exercise political power. He concludes that these factors may be a reflection of coercive power that stifles efforts at social reform. Gaventa (1982:252) says that “the quietness of this segment of America’s lower and working class perceived at a distance cannot be taken to reflect consensus to their condition or seen to be innate within their socio-economic or cultural circumstances... Generalized discontent is present, but lies hidden and contained.” Shriver’s (2000) study in Oak Ridge, Tennessee, argued that even in a highly educated and affluent community, collective activism against a polluting industry was stifled by residents made fearful of upsetting a comfortable status quo.

Pinder and Harlos (2001:350), drawing on Hirschman (1970), provide theoretical clarity and empirical evidence from employee groups indicating that “quiescence is a relatively voluntary and conscious state in which employees have not accepted their ‘objectionable state of affairs’.” “In contrast, acquiescent employees are silent more or less voluntarily, and without conscious awareness of their state. Tolerance for the status quo is relatively high; acquiescent employees have accepted their circumstances as normal, or to be expected.” They say that “acquiescence is a deeper state of silence than quiescence. It requires more assistance or provocation to be broken than quiescence... Pinder and Harlos (2001:349) argue that “people in deep acquiescence have given up hope of improvement and become more or less oblivious to the

importance of external events that may provide grounds for hope and a possibility for amelioration.

Landowners in the pipeline counties of the present study have what Gaventa (1980:253) might call a “view from below.” “In the pipeline study, “*quiescence* is defined as not taking action against the pipeline, despite feeling negative quality-of-life impacts from it” (Bell et al. 2022:4). This definition recognizes the consciousness of injustice, but also resigned silence. This quiescence could be conceived in systems terms as an attenuation loop that dampens the connection between industries or state agencies and citizens’ perceptions of pipeline danger. By suppressing the dangerous and disruptive potentials of the pipeline, industry and state actors promote public inaction. This is often done by “generating uncertainty, indecision, and doubt among audiences (Knight and Greenberg 2011: 326), similar to the campaigns to resist regulation of tobacco (Oreskes and Conway 2010), pesticides (Harrison 2012) and coal (Bell 2016). Button(2010) suggests that industry’s tendency toward secrecy promotes the “social production of uncertainty” in previously close-knit communities.

Pipeline opponents push back against such industry tactics as the so-called “gag orders”, realizing their potential for divisiveness. These sorts of tactics can be viewed as a manifestation of Lukes’ second dimension of power. Landowners conscious of such tactics may have reasons to be quiescent, but they are not acquiescent. In Pinder and Harlos’ study of female Canadian army recruits, (2001:348) “A state of quiescence connotes disagreement with one’s circumstances, in effect suffering in silence while being aware of existing alternatives to change the status quo, yet unwilling to explore them. Nevertheless, quiescent employees are ready to break their silence to change the circumstances that fostered or produced the silence.” In contrast, a study by Shriver et al (2019b) find that some oil refining communities choose inaction

by accepting pollution as the unavoidable price for economic benefits. This indicates acquiescence. Malin's theorization of "sites of acceptance" (2014; 2015) similarly describes uranium mining and unconventional oil and gas refining communities that accept negative impacts based on neoliberal logics. Malin's challenge to research based only on "sites of opposition" demonstrates that Gaventa's (1982:25) observation remains true: the roots of quiescence (and acquiescence) are still tangled. It remains for scholars to fully articulate differences among active and passive forms of acceptance and support and their implications for environmental justice.

Activism against hazards affecting natural and human environments

Concern for the preservation of the natural environment in the United States emerged in the late nineteenth century with the drive to protect natural resources from accelerating industrialization (Brulle and Rootes 2015; Rootes 2004). By the 1960s writers such as Rachel Carson (1962) made it clear that the conservation movement had not adequately protected the natural and human environments from the adverse consequences of industrial activity. The environmental movement in the United States quickly emerged as part of the protest cycle of the 1960s and, with similar movements in western Europe, expanded worldwide (Staggenborg 2011:100-101). Much of the work of institutionalized environmental organizations such as Greenpeace, the Sierra Club or the Green parties in western Europe has, since their emergent phase, been concerned with education and lobbying. Their institutionalization has arguably dampened activism (Dowie 1995), but it also created stable opportunities for passive participation through political consumerism ranging from the Montgomery bus boycott (Friedman 1999) to the anti-sweatshop, fair-trade, and living-wage campaigns (Shaw 1999;

Wimberley et al. 2015). These factors may influence the capacity for resilience of pipeline opposition groups.

The environmental justice (EJ) movement emerged in the 1980s as a critical response to the mainstream, institutionalized environmental movement, which failed to recognize the inordinate burden placed on the working poor and people of color. Robert Bullard (2000:121) writes, “The environmental justice framework rests upon an ethical analysis of strategies to eliminate unfair, unjust, and inequitable conditions and decisions.” One of several characteristics of this framework argues that the burden of proof that people have been protected from environmental harm should be the responsibility of those who produce the harm (Bullard 2000:123). Interviews with landowners close to the Mountain Valley Pipeline provides evidence that the burden of proof that the natural or human environment has been harmed has fallen largely on local residents rather than on hired inspectors. This would then be one kind of evidence that the pipeline protest is a fight for environmental justice. The burden of proof is imposed on the aggrieved public, made even heavier by the fact that few individuals who experience injustice actually become involved (Lapegna 2013; McAdam and Boudet 2012). The issue of involvement is studied by Bell (2016:5) and Gaventa (1980), who suggest several powerful barriers to participation in coal communities, as does Cable and associates (Cable et al. 1999, 2008) for the nuclear weapons industry, and Harrison (2011:28-29), who describes how the suppression of the civil rights of migrant agricultural workers is actively constructed by the state and the agricultural industry. Bullard (2000:35) cites his own and other empirical evidence that “toxic-waste dumps, municipal landfills, garbage incinerators, and similar noxious facilities are not randomly scattered across the American landscape. Like Staggenborg (2011:117) he

argues that it is the working poor and people of color who typically pay the price for environmental pollution and toxic waste.

Despite impediments to the mobilization of grassroots movements (see McAdam 2017 for circumstances that impede climate change activism), environmental activists have occasionally succeeded in their challenges to industry and government. The case of Love Canal back in 1977 (Gibbs 1982; Levine 1982) resulted in the Citizen's Clearing House for Hazardous Waste (now the Center for Health, Environment and Justice), which works with thousands of community organizations across the United States (Taylor 1993). Collective action is sometimes the result of a "suddenly imposed grievance (Walsh and Warland 1983:764), as was the case for the nuclear accident at Three Mile Island in 1979, and at other times is the result of a gradual emergence facilitated by outside support, such as with the 1982 Warren County, North Carolina protests over the location of a toxic waste dump in a mostly African-American community. The community was stonewalled by state legislators but prevailed after launching a nonviolent direct action that resulted in the decontamination of the site and the recognition of environmental racism as a social justice issue (Bullard [1990] 2000).

Activist groups have pressured public officials to recognize that rural environmental injustices are often eclipsed by issues in urban areas (Hale 2011), resulting in United States Department of Agriculture regulations and enforcement that ensure the quality of life in rural America (USDA 2001). But despite federal and state programs designed to provide oversight in both urban and rural areas, the regulatory power of agencies is constantly challenged by special interest groups, sometimes fronting as fake countermovement "astroturf" organizations (Austin 2002; Greider 1992). Transparent and clandestine lobbying groups have been described for the

crop protection (Harrison 2011), coal (Bell and York 2010), mineral mining (Shriver et al. 2014), electric utility (Kim et al. 2016) and other industries (Brulle 2018).

Factors that underpin response toward environmentally contentious projects

Snow and Soule (2010:23) say that shared grievances push individuals toward a collective response to powerholders. These grievances, such as “dissatisfaction, fear, indignation, resentment, and moral shock”, address the question of why people organize for collective action. But there are other general factors, such as “the desire for approval, and peer pressure” (2010:24) that pull bystanders into movement support. Scholars have recently drawn attention to modern differences in how people participate in social movements. Putnam (2000:152) says that “social networks are the quintessential resource of movement organizers.” Family, neighbors, church members, and fellow workers may be resources for increasing the capacity of landowners for resilience in the face of the pipeline project, as they construct a collective perception of risk. Putnam’s assertion was certainly validated during the early days of the civil rights movement and continues to provide membership stability in many face-to-face organizations. But Micheletti (2003:25) speaks of “individualized collective action” to describe a preference by many contemporary bystanders toward non-face-to-face support for collective goals. Micheletti suggests that political preferences may nowadays be expressed through “political consumerism (2003:2), blurring the line between public and private political participation. Individualized collective action may, for example, manifest as a preference for organic, renewable, fair-trade, union-label and/or locally produced consumer products, without any necessity for face-to-face interaction (Balsiger 2010).

The Sierra Club, the National Audubon Society, and Greenpeace have increased their membership relative to the Isaac Walton League mainly because of they use direct-mail

marketing campaigns to pull people into activism, and the Isaac Walton League does not. The National Rifle Association similarly relies on its professional staff to maintain its membership. Like other organizations that cultivate conscience constituents (McCarthy and Zald 1977), active, face-to-face involvement has declined (Putnam 2000:63). The rise of isolated constituents or “checkbook members” (Jordan and Maloney 1997) may be available to sign an online petition, with no further commitment in time or effort. Wuthnow (1998) claims that these more “porous” forms of association reflect the fluidity of contemporary life, but the loss of face-to-face interactions results in a loss of social capital (Kriesi and Baglioni 2003:5). The foregoing discussion indicates that what counts as support for activism must be amended to reflect the fluidity of contemporary social relationships.

The shift to consumer, checkbook, or online identities among movement constituents is the result of what John McCarthy (1987: 58) argues is a “social infrastructural deficit.” Proxy political participation, according to this earlier generation of resource mobilization theorists that included McCarthy and Zald, is less likely to foster what Tilly (2005) called “networks of trust.” But a newer generation of theorists, influenced by “the cultural turn,” emphasizes grievances, meaning, emotions (Aminzade and McAdam 2002; Goodwin et al. 2004;), informal participation, decentralization, and grassroots democracy (Fantasia 1988; Steinberg 1999). Gamson and colleagues (1982; 1992a, b) sounded a similar call in his promotion of the “injustice frame.” Scholars of environmental justice say that environmental activists are still concerned with protecting the natural environment but are in addition concerned with the procedural injustice of environmental threats that disproportionately burden poor and marginalized populations (Cole and Foster 2001; Hunold and Young 1998; Lake 1996; Schlosberg 2007; Shrader-Frechette 2002). Schlosberg further claims that there is an erosion of the collective

agency of indigenous populations when they are excluded from planning decisions. Despite the politics of exclusion Harvey (1996:385) argues that of all forms of environmental movements, the environmental justice movement is particularly resistant to cooptation by corporate or governmental discourse.

Turner and Killian (1987:242) early recognized that “the common element in the norms of most, if not all, movements is the conviction that existing conditions are unjust.” In addition to the grievances suggested by Snow and Soule mentioned at the beginning of this section, Aminzade and McAdam (2002:108) say “Successful leaders deploy complex cultural knowledge in their quest to connect abstract cognitions of injustice to emotions of anger, fear, grief, and revenge and thereby harness emotional energy to their projects of political change.” These emotions are shaped by cultural understandings and norms (Hochschild 1983; Zurcher 1982) that can operate at a microlevel to turn bystanders into participants (Wood 2001). Emotions, then, are cultural accomplishments that can be treated as “normal variables or mechanisms in our models of social movements” (Goodwin et al. 2004:416). Sensory perceptions such as watching pipeline workers come onto a property, listening to a neighbor describe the pipeline project, or hearing construction sounds (explosions, engines, or helicopters, for example) may, through a cognitive process, generate a rational response such as danger or a disruption to the status quo (Prinz 2006). Perceptions may also generate emotional responses such as fear, disappointment, and sadness. Emotions may not be the result of a cognitive process, but they are not irrational (Jasper 1998:398) unless, as sometimes happens, they consistently lead to deleterious consequences (Jasper 1998:404). Emotions convey what we care most deeply about, toward people, places, ideas, and things (Goodwin et al. 2004:418-419). These writers argue that “collective identities, in fact, are nothing more or less than affective loyalties,” and are the stuff of politics (Schmitt

[1932] 1996). Jasper (1998:398) says that “emotions... shape the goals of our actions.” When a sentiment such as attachment to a neighborhood is threatened, Heise (1979, 1988) predicts that a resident will fight to protect it. I integrate these ideas about how perception and emotion influence attitudes to argue that property owners’ responses to the pipeline project, particularly in the context of rural Appalachia, are a social accomplishment and a factor, like the sense of injustice, which pushes residents in the pipeline’s path toward support or opposition.

Economic, political ideological, and distance-related influences on attitudes toward infrastructure projects

Researchers have studied a range of factors associated with attitudes toward utility-grade energy-infrastructure projects. As noted earlier, the word ‘attitude’ here simply refers to ‘feelings or emotions toward a fact or state’ (Merriam-Webster 2017). Those attitudes are influenced in part by people’s reaction to profit-driven industries that generally pay minimal and inadequate attention to the harm caused by their processes and products at every link of the supply chain, from the sourcing of raw materials to the disposition of waste. Within that vast universe of inattention (for review, see Szasz 1994), some researchers have more narrowly studied public response to projects aimed at supporting a country or region’s energy infrastructure. This review focuses on the origins of such response: the characteristics of individuals, groups, and social identities that are associated with specific evaluations of projects that either produce or transmit a form of energy at the scale of a public or private utility. I have a number of goals in highlighting these specific studies. The first goal is to review factors claimed to predict or correlate with public attitudes toward utility energy infrastructure projects. The second is to distinguish between factors associated with sites of energy production, such as energy-producing mines, processing facilities, and power generating stations, and factors associated with sites of energy

transmission, such as petroleum and natural gas pipelines, and electrical transmission lines. It is imprecise and misleading to conflate sites of energy production with sites of energy transmission. It is also ultimately damaging to the accurate representation of affected publics. I am particularly interested in studies that used social representation theory, because they help structure my inquiry into landowners' awareness, interpretation, evaluation, and response to perceived dangers and disruptions to the pipeline project.

Gervais' (1997) study is not a study of attitudes toward energy infrastructure, but it is an early example of how social representation theory can be used to elicit the attitudes of people affected by a disaster. The author distinguished between media and 'real Shetlanders' representations of the *Braer* oil spill in the Shetland Islands. The media characterized the spill as an environmental disaster, but were frustrated by the islanders' passive response. The study revealed that the Shetlanders' incomprehensible response to the disaster was the result of the islanders having interpreted and evaluated this seemingly unique event as no more than the latest challenge to their maritime economy, similar to the ways that farmers respond to unusual weather events or perturbations in the market for their goods. This study is a cautionary tale about making assumptions inadequately informed by on-the-ground fieldwork.

Warren and associates (2005) examine distance-related attitudes toward wind turbine farms in Scotland and Ireland. Their surveys reveal an overall 'inverse-NIMBY' (not in my back yard) attitude: "The most favourable views were held by those living closest to existing windfarms." (2005:866). Wind power is recognized as a 'clean' power-generating technology, and also as a new source of income for rural communities (2005:856). Brauholtz (2003) found a similar reverse or inverse-NIMBY effect associated with close proximity, due to perceptions of royalties or employment (an economic influence). The research by Warren and associates found

that NIMBY opposition decreased as proposed sites became operational. The research also found that aesthetic considerations, both positive and negative, strongly influenced public attitudes. The aesthetics of windfarms then has a upside unmatched by the MVP project, which is consistently characterized as a scar on the landscape.

Jacquet (2012) sent a mail survey to landowners living near natural gas and wind farms in northern Pennsylvania. Distance was precisely measured in the case of the natural gas fields by using GIS-generated data from the center of a respondent's property to the nearest gas well (2012:682). Note that the data-processing capabilities of GIS software had been used by siting decisionmakers, for utilities and otherwise, since the 1980s (Jankowski (1995). Only more recently has the technology been added to the toolkits of academic researchers. GIS, coupled with the aerial surveillance capabilities of drone technologies, add to the tactical resources of social movement organizations (Choi-Fitzpatrick 2020). Jacquet's study found a weak association between proximity to wind farms and attitudes toward them, and no relation between proximity to gas fields and attitudes toward them. Attitudes toward natural gas development were highly dependent upon respondents' attitudes toward the environment, and also were positively affected by the potential for leasing or employment income in the case of natural gas, so this is again an economic influence on landowner attitude. Several authors, such as Jerolmack (2018) comment that this research, like others, found that exposure to pollution and ecological disruption were not associated with opposition to natural gas wells in Pennsylvania. This distance-related economic consideration by landowners then seems to be important for these sites of energy production, but as will be shown, it is not important for landowners in the path of the Mountain Valley Pipeline, as a site of energy transmission.

Malin (2014) explores the cases of two uranium-mining communities in rural Colorado to illustrate the contention that communities are sometimes sites of activism for industrial production: ‘sites of acceptance,’ and not just ‘sites of resistance,’ which are the more common focus of environmental justice scholarship. Sites of acceptance privilege local autonomy regarding land use, rather than other [perhaps scale-dependent? (see p. 272)] factors like pollution or health outcomes. The author argues that this perspective is more inclusive, reflexive, and respectful/responsive to the experiential knowledge of local communities. My assessment is that this argument does not diminish the legitimacy of conventional environmental perspectives but is instead necessary for the discovery of common values and goals among stakeholders in environmental stewardship. EJ activists and scholars often (though not always) aim to mobilize transformative sites of resistance (p. 267), even when (more commonly) economically challenged communities are willing to sacrifice their health and welfare. The author notes (p. 270) the co-presence of poverty and an ethic of self-sufficiency. That insight may also apply to parts of rural Appalachia. Malin argues (p. 272) that dependence on uranium production may be these communities’ most rational choice, while maintaining their “personal identity and local heritage.” [see reference similar to ‘nostalgia’ on p. 274]. It may also inspire hope for residents of communities with persistent poverty. Malin considers these arguments within sites of acceptance as “different yet equally valid notions of EJ...” (p. 278). However, Malin remains suspicious of sites of acceptance that seem to ignore ‘the precautionary principle.’ (p. 281). Malin calls for scholarly exploration of sites of acceptance in other energy and environmental sectors (p. 282), such as natural gas transmission projects. The MVP is one such project where the connection between acceptance or resistance toward the pipeline may be associated with

either rational economic choice or political ideology as an indicator of personal identity and local heritage.

Clarke and associates (2015, 2016) made recent contributions to the study of public perceptions toward unconventional oil and gas development (UOCD) projects. Their work is important to this study because it specifically addresses the interaction of geographic distance and political ideology in UOCD projects, which are sites of energy *production*, but address factors directly relevant to sites of energy *transmission* such as the MVP project. Their studies specifically aim to address what they argue is an inconsistent association between distance and public perception across studies. They find in their own work that political ideology becomes a more important factor in people's evaluation of UOCD projects as distance increases. They conceptualize the difference between 'near' and 'far' in terms of psychological distance. When an issue or object is 'near,' it is perceived to be more immediate and concrete, whereas more distant objects are construed in a more abstract manner. Although the perception of distance may be considered a social or psychological construction, my assessment is that when detailed, GIS-driven measurements of distance between property owners and pipeline are available, they are more empirical and meaningful measures. The authors (2016:14) indicate agreement with this assessment: "We believe, though, that such indicators are less ideal than geographic distance." However, they note how challenging it can be to find accurate distance data. Nevertheless, they found that conservatives and moderates were more supportive of UOCD projects as distance increased. Differences in distance had no effect on the level of support for the projects among liberals (Clarke et al. 2016).

Gravelle and Lachapelle (2015) also contribute insights into the association between proximity and economic, demographic, and political ideological factors. They found in the case

of the Keystone XL pipeline that men, older people, and those with less education were more likely to support the pipeline. They also found that people who report concern for the fragility of the economy are more likely to support the pipeline, but those who report a concern for the environment are more likely to oppose the pipeline. Also they find that Republicans are more likely to support the pipeline than Democrats, and both moderates and conservatives are more likely to support the pipeline than are liberals. “Distance is significant and negative” (p. 104): Nearness to the pipeline is associated with support, whereas people further away are more likely to oppose. This is an inverse-NIMBY effect similar to other energy-siting projects (Boudet et al. 2016; Devine-Wright 2009; Jacquet 2012; Jerolmack and Walker 2018; Malin and DeMaster 2016; Malin et al. 2017; Mason et al. 2015). This inverse-NIMBY attitude is reported for sites of energy production, but my research presents evidence that it is not necessarily the prevailing attitude in the case of the Mountain Valley Pipeline, which I characterize as a site of energy transmission. This challenges claims that inverse-NIMBY attitudes are generally characteristic of utility-scale energy infrastructure projects.

A survey of individual attitudes toward fracking in Pennsylvania, Ohio, and Texas by Alcorn and associates (2017) suggests that geographic proximity to shale gas development is not as important as regionally specific economic interests. However, the distance measures in this study are in ten-mile intervals from the closest active well. The GPS data available for the MVP study more precisely measures actual geographic distance. Not surprisingly, this study showed no consistent association between perceived or actual distance and preference for a moratorium on fracking (p. 525). The authors note that “we need to understand what scale is most representative of a respondent’s neighborhood or community...” in discussing inconsistencies in the role of distance (p. 532). The findings of inconsistencies in trends from state to state may be

interpreted as evidence that findings for Appalachia need not mirror findings at other regional scales.

Jerolmack and Walker (2018) claim a “lack of sociological attention” (p. 481) to inverse-NIMBY attitudes, such as they find in economically challenged Lycoming County in rural Pennsylvania. Their emphasis on economic factors underscores their claim that “this phenomenon has received little attention from EJ and movements scholars, most of whom focus on case studies of resistance against- or acquiescence in the face of- so-called LULUs.” (p. 484). So Jerolmack and Walker focus on what they call the “quiet mobilization” of community members, which “need not involve a sense of oppositional consciousness, let alone a sentiment of cognitive liberation (McAdam 1982).” (p. 485). This ethnographic case study features interviews of residents who accept environmental risk (believing that antifracking activists are mainly clueless “urban liberals” (p. 502) as the price for economic gain, contra the “devil’s bargain” argued by Malin and DeMaster (2016). The authors attributed this position to libertarian partisan identities based on principles of self-determination. My research provides no evidence of mobilization in support of the MVP, aside from a few comments during the draft Environmental Impact Statement public comment period written in support of the pipeline. These, however, were outnumbered by orders of magnitude by the comments opposing the pipeline. This may be consistent with the lack of association between economic self-interest among property owners and attitude toward the pipeline.

The literature reviewed in this section suggests these observations:

- Researchers emphasize associations between residents’ attitudes toward energy projects and economic, political ideological, and distance-related factors
- There are no consistent trends between residents’ attitudes and any of these factors

- Most case studies are of sites of energy production rather than sites of energy transmission

This review concludes with one recent exception to that last observation. Bergquist and associates (2020) study attitudes toward two U. S. energy transmission projects: a pipeline and an electrical power line. The authors distinguish this from prior work on attitudes toward electrical generation facilities. “Residents interpret information about economic impacts through the lens of sense of place, as shaped by social representations of new and familiar experiences.” (p. 2). It is important because it is one of a few studies that applies Devine-Wright’s (2009) model of the process by which a novel event is interpreted and evaluated on a microsocial scale. Also, it underscores the importance of research that emphasizes sense of place as a factor that is specifically relevant in distinguishing sites of energy production from sites of energy transmission.

Demographic differences among environmental activists

This research claims that the Mountain Valley Pipeline is an environmental injustice. For that to be so, the claim requires evidence that the pipeline imposes a disproportionate burden on economically disadvantaged and marginalized groups. Klandermans et al. (2015: 156) succinctly make a distinction between conscience constituents and beneficiary constituents: “Because they are not potential beneficiaries, conscience constituents are not contributing to a social movement out of self-interest.” Conscience constituents are therefore those who are sympathetic to the vulnerabilities of beneficiary constituents. There may be demographic differences between activists and those who benefit from that activism (Amenta and Caren 2004; Klandermans et al. 2015; McCarthy and Zald 1977). This distinction may become apparent in differences between landowners whose property is in the blast zone and those who are geographically more distant

from direct harm (Gravelle and Lachapelle 2015). The presence of free riders (Olson 1965), those who are potential beneficiaries but do not become constituents, recognizes that not all beneficiaries become constituents. The free rider concept may be informative in the study of landowner indifference, in the sense that it involves a willing suspension of political power. Perhaps it is due to cultural hegemony, which in some cases results in a lack of mobilization. Steven Lukes (2005) describes this as the ‘second dimension of power’, the ability of elites to compel inaction, and illustrated in Gaventa’s (1982) work. We conceptualize this resigned silence as quiescence (Bell et al. 2022). Rationally nonacting citizens may also simply be indifferent particularly when an issue has no direct effect on them (Downs 1957). My interviews were watchful for indifference among property owners with different demographic characteristics or social identities. Conscience constituents tend to be liberal, middle-class, and motivated by moral and other convictions (Crossley 2002:67; Jenkins and Perrow 1977:264). However, this tendency has been complicated since the 1990s by a partisan divide which now makes environmentalist identity a strong signal of political affiliation in the United States (Brick and Lai 2018:9; Sexton and Sexton 2014). In general, though, if a constituency feels a sense of solidarity with a disadvantaged group, it is more likely to engage in action that supports that group (Beaton and Deveau 2005; Subasic et al. 2008). And if identification with a disadvantaged or marginalized group generates feelings of anger, that constituency is more likely to engage in collective action that supports those disadvantaged or marginalized groups (Leach et al. 2006). Demographic data collected for this research will provide measures that can differentiate between constituencies and differentiate their support for anti-pipeline activity. Support for or mobilization into activism may be characterized as any kind of adaptation by either conscience or beneficiary constituents that has the goal of building social capacity (Brooks 2003:9).

D. Sense of place

Place attachment, dependence, and identity

Sense of place is a complex concept that is well articulated in the literature, along with related concepts such as place identity, place dependence, and attachment to place, following the pioneering work of Relph (1976) and Tuan (1977, 1980). Tuan described the sense of place as a center of meaning constructed by experience. A space becomes a place as it becomes infused with social meaning. So, sense of place is the socially constructed product by which a location develops meaning. For landowners whose sense of place has been disrupted by a natural gas pipeline, this sense of place may become what Snow and Soule (2010:53) call an animating grievance: the disruption that finally drives a person to action. For others, who may be swayed by the counterframing of infrastructure developers, or by other considerations, the same set of place-based considerations may have little or no resonance.

There is a considerable body of environmental literature concerning the connection between sense of place and environmental hazard. There is, for example, research suggesting that when a new hazardous or stigmatized industry is proposed for a community, proximity is associated with an elevated level of objection or concern (Boholm and Löfsted 2004; Gravelle and Lachapelle 2015; Lima and Marques 2005; Vorkinn and Riese 2001). However, levels of concern may be *lower*, and acceptance may be *higher* after a facility is established (for discussion, see Venables et al. 2012). A hazardous facility may be subject to a “proximity effect” (Venables et al. 2012: 372) that may be greatest during construction but may be normalized with familiarity over time. However, the facility may be reframed as a risk issue if there is a real or perceived disruption in normal operation (Parkhill et al. 2010). A study of a proposed hydropower plant (Vorkin and Reise 2001) found that place attachment was the strongest of their

predictors of attitudes regarding the project. Hinojosa and colleagues (2016) suggest that place attachment may generally be greater in environments where life is difficult, such as the rugged French Southern Alps where they conducted their study of livestock farmers. A followup study in an indigenous Andean community found that a connection between place difficulty (biophysical constraints and/or an unfavorable built environment) and place attachment may only occur when combined with high levels of place identity (Hinojosa et al. 2019). There is evidence that some people prefer living in difficult environments (Loewenstein 1999; Olivola and Shafir 2013).

Place identity refers to the incorporation of a place's emotional or symbolic meaning into an individually or collectively determined sense of self (Chow and Healey 2008; Hinojosa et al. 2019:6; Proshansky et al. 1983). Place identity then is a back-and-forth construction of a relationship with an environment that is itself a social construction. It is how the meaning of a place becomes a part of who we are, as individuals, groups, or culture (Low and Altman 1992:6). Proshansky and colleagues (1983:59) considered place identity to be "a sub-structure of the self-identity of the person consisting of, broadly conceived, cognition about the physical world in which the individual lives." Twigger-Ross and Uzzell (1996) argue that place identity is a social category that expresses membership with others who define themselves in terms of a specific location. Age and race are two of these categories that Byrnes (2016) explores in relation to place. Raymond and colleagues (2010: 423) report on models of place attachment and pro-environmental behavior, with "significant positive relationships found between place identity and willingness to engage in pro-environmental behaviors (Stedman 2002; Vaske and Kobrin 2001) and place-protective actions (Devine-Wright and Howes 2010)." These measures may also tend to push residents into support for anti-pipeline activism. Time in place increases a person's

place identity (Casakin et al. 2015). Batteau argued (1990) that identity is not only constructed but invented; Alfred (1999, 2009) and Coulthard (2008, 2014) argue that the recognition of indigenous identities is better served by the self-fashioning of authentic self-determination than by gestures of accommodation and reconciliation. This strategy of resilience of identity in the face of racial oppression may be more reinvention than invention. Erikson (1968) said that identity is never a permanent achievement. It is, instead, a dynamic social achievement, a constant reconstruction.

Place attachment as it has developed in environmental psychology has been reviewed comprehensively (Giuliani 2003; Lewicka 2011). Place attachment generally refers to the emotional ties that people develop for their places of residence (Lewicka 2008, 2010; Low and Altman 1992; Shumaker and Taylor 1983), or, as Rubinstein and Parmelee (1992:139) suggest, “Attachment to place is a set of feelings about a geographic location that emotionally binds a person to that place as a function of its role as a setting for experience.” Age is critical in the sense that attachment to place develops over the life course.

Lewicka (2010) finds few systematic studies that identify predictors of place attachment from residential place. Lewicka’s (2008, 2010) studies are among those few that use a place attachment scale, specifically comprised of 12 positively framed and 12 negatively framed items indicating participants’ feelings toward the places where they live, at various geographic scales. Perhaps the present study may be able to identify rural Appalachian identity as one such predictor of place attachment. This would be consistent with studies (Hidalgo and Hernandez 2001; Lewicka 2010) that find a curvilinear relationship between place scale and place attachment. So, for instance, we might predict that rural Appalachian property owners would report a high level of emotional bonding to their immediate neighborhood that might decrease at

the county level and then increase again by reporting a high level of emotional bonding with the Appalachian region.

Lewicka (2011) concludes from a survey of studies of place attachment that the development of theory has been inhibited by emphases on individual differences. Lewicka (2010:38) cites social ties and sense of security as the two main positive predictors of place attachment and suggests a number of ways that these predictors may be operationalized. Low and Altman (1992) acknowledge the multidisciplinary foundation of the concept. They argue that “collective social attachments to places are especially salient during times of relocation, upheaval, and environmental disasters” (Low and Altman 1992:6). Place attachment can be seriously disrupted when there is a change in the environment. This may happen rapidly as in the case of an environmental disaster, or gradually with the decline of an environment such as a neighborhood (Brown et al. 2003). Bonaiuto and colleagues (2016) similarly find from what they describe as a limited literature that strongly attached individuals underestimate the potential effects of natural environmental hazards. Strongly attached individuals are also disinclined to move if there is a disaster, and are more inclined toward returning afterward. The literature is even more limited for similar studies with anthropogenic hazards. Place attachment studies from a variety of disciplines recognize the centrality of an affective bond that is usually positive, based on a mixture of emotions that is complex and dynamic (Low and Altman 1992). Purcell (2021) recently edited an exploration of projects in Appalachia that removed and resettled families and communities, finding that landowners reported both oppression and opportunity. Complexity is reflected in Low and Altman’s argument that place attachment is not only emotional but may also be accompanied by cognition and practice: thoughts and actions (Pp. 4-5). This contrasts with earlier work, which was primarily phenomenological (Bachelard 1964; Eliade 1959; Tuan

1977). Recent work recognizes that place attachment is multidimensional, requiring analysis that is systematic and rigorous. One such analysis, by Brown et al. (2003) found that attachment to place is enhanced by daily encounters with the environment. Rollero and De Piccoli (2010:199) argue that “place attachment and identification should be influenced by different variables and thus be distinguished by different predictors.” They suggest caution due to a lack of consensus regarding the operationalization of these constructs. The study of place attachment has indeed been approached with caution in psychology and particularly in the sociology of social movements, at least until the cultural turn of the 1980s (Van Ness and Summers-Effler 2018). Bonaiuto and collaborators (2016: 35) note that “despite the apparent importance of locale and attachment to place in environmental risk perception and coping, place attachment has been given little systematic attention within the risk literature.” This reluctance, partly due to an unfortunate conflation of emotion with irrationality, is surprising, since place attachment functions, both individually and collectively, to support survival and security (Scannell and Gifford:2010, 2014) by defining what may be lost in risky situations. The “place” of place attachment requires questions of scale that are often different from the attachment people feel toward other people or objects (Low and Altman 1992:5). Attachment to place may differ at different scales, even for the same person, as when a property owner expresses simultaneous or varying attachment to a local, regional, and global place. It is the ability of a place to satisfy a person’s needs or behavioral goals (Stokols and Schumaker 1981).

Place dependence is emphasized by researchers (Schreyer et al. 1981; Williams et al. 1992) focused on the physical conditions of a place that support an intended use, and also by those who focus on psychological and social aspects, measured in terms of such constructs as belongingness and neighborhood attachment (Brown et al. 2003; Hidalgo and Hernandez 2001;

Kyle and Chick 2007). Raymond and colleagues (2010) review a number of psychometric scales that measure how the physical environment interacts with psychological and social goals to determine place dependence. They call for a new generation of models that consider the interaction between attachments to the natural and social environments in the formation of such measures as place identity and place dependence. Samson and Goodrich (2009), for example, cite communities with unique characteristics that bind them to both a specific social and natural environment. The historic village of Newport and communities on Peter's Mountain – places in the path of the Mountain Valley Pipeline – may reflect such an interaction between the social and natural environment.

The physical conditions of place do not capture other factors that foster place dependence, such as ancestral and cultural connections (Hay 1998) and experiences shared among neighbors and family (Kyle and Chick 2007). The community has an important role in the formation of place attachment. This role is captured by the distinction between social and physical vulnerability in the conceptual framework. There is also research which substantiates the connection between socio-cultural factors and sense of place (Stedman 2003), justifying the connection between social and cultural location and disruption to sense of place. This connection is also recognized by Relph (1989:26), who writes from a phenomenological perspective that places “are constructed in our memories and affections through repeated encounters and complex associations.” This review of the sense of place literature highlights a persistent overlap in the meanings of its main constructs: place identity, place attachment, and place dependence. Conceptual frameworks that recognize that connection to place is based on both sociocultural and physical locational factors are an important advancement in theory. The proposed research will therefore draw from both physical and sociocultural measures of place attachment, place

identity and place dependence as developed by Williams and colleagues (1992), Williams and Roggenbuck (1989), Williams and Vaske (2003), Raymond (2009), Kyle and colleagues (2005), and others.

Disruption to sense of place as an environmental injustice

A hazard has the potential to disrupt the lives, including the sense of place, of all people living within an impacted geographic area. Hazard researchers (Blaikie et al. 1994; Cutter et al. 2000; Hewitt 1997) argue that some groups may be more vulnerable to hazard exposure than others. In other words, variation in *vulnerability* exists prior to a disaster (UNISDR 2004). Similarly, variation in *resilience* (Gunderson 2000; Holling 1973:14) manifests before, during, and after a disaster (Cutter et al. 2014, 2016). There are important place-based social or biophysical differences that influence both vulnerability prior to and resilience following a disaster (Cutter et al. 2008:599). These differences have implications for research focused on environmental justice, because some socioeconomic groups more than others may lack the physical, social, institutional, economic, or ecological resources necessary to adapt to a post-disaster environment. In Gunderson's (2000) terms, they may fall short of the adaptive capacity necessary to establish a new stable state. Unequal vulnerability to hazards and unequal capacities for resilience following disasters therefore comprise an important subject of sociological inquiry.

The connection between hazard or disaster and environmental justice developed slowly among social scientists. Adaptation following disruption to sense of place is often encountered in the environmental injustice literature following disasters that are anthropogenic, and less often after natural disasters. Anthropologists have long studied cases of human adaptation to natural hazards (for review, see Oliver-Smith 1996), as when big-game hunters adapted their social organization in response to changes in temperature and humidity during the Pleistocene (Barton et al. 2007).

Contemporary climate change similarly increases risks for many vulnerable populations (Ibarrarán et al. 2009). Humans have impressive capacity for adapting to the uncertainty of the natural environment, but there have also been notable cases in which human activity resulted in large-scale environmental collapse (Diamond 1997, 2005). In recent history the line between natural and human caused disasters is more likely to be blurred, as social scientists and other scientists recognize the necessity for an integrated theoretical framework that does not centralize either the natural or social construction of knowledge (Bullard and Wright 1987; Freudenburg et al. 2009). The social-natural debate as it relates to environmental sociology is reviewed by Irwin (2001). The conclusion of most discussion suggests the need for a pluralistic framework. It is illustrated by such cases as when poor building construction practices exposed the residents of Port-au-Prince in Haiti or the citizens of northwestern Turkey to danger during an earthquake, or when a tsunami exposed coastal Japanese communities to radiation from ill-placed nuclear plants. In such cases there is a disruption not only to the natural environment but also to the lives of individual people and to the social fabric that binds them together. Gill and Malamud (2017: 247) argue further that “anthropogenic processes may influence the occurrence, frequency or intensity of natural hazards,” sometimes in a cascade of secondary interactions. Examples might be when a pipeline construction process influences the likelihood that stream water becomes more turbid, which then results in the death of aquatic fauna, or when farm wells go dry due to the fracturing of subsurface geology after longwall mining for coal, resulting in the collapse of a longstanding agricultural economy (Lechner et al. 2014). But history is not written by the powerless, so it has until recently been silent to the disproportional weight of adapting to disaster imposed on those with the fewest resources.

Sociologists became interested in environmental injustice in the late 1960s and the 1970s with the emergence of the environmental movement (for review, see Brulle and Rootes 2015; Carmin 1999; McCarthy and King 2005). Capitalist accumulation and rapid technological change presented easily quantifiable evidence that social interactions, institutions and beliefs were complicit in the proliferation of anthropogenic hazards. The toxic pollution at Love Canal, the *Exxon Valdez* oil spill, the nuclear reactor accident in Chernobyl and the explosion at the Union Carbide plant in Bhopal, India are well-known early examples that some theorists such as Ulrich Beck and Anthony Giddens claim affect everyone, positing a “risk society.” Others emphasize that hazards inordinately favor some groups at the expense of others (Bullard and White 2009; Edelstein 2004; Enarson and Morrow 1998; Fothergill and Peek 2004). The unequal distribution of risk is particularly evident when human agency exposes vulnerable people to natural hazards, as was the case in low-lying neighborhoods around New Orleans during Hurricane Katrina in 2005 (Freudenburg et al. 2007). Freudenburg (2005:89) calls the pattern by which privileged groups have unequal access to environmental rights and resources “disproportionality.” Collins (2016) distinguishes between this “polluter disproportionality” and the disproportionality of exposure that receives more attention from environmental justice scholars (Boyce 1994; Mohai et al. 2009).

When human activity creates the potential for loss that we call an anthropogenic hazard, and a natural event like a tsunami or a rainstorm turns that potential into a disaster, there is a tendency to dismiss that danger or disruption as an “act of God” or an “act of Nature.” Environmental activists often question just how “natural” these disasters are. Displaced attribution following disaster also occurs when victims of harmful decisionmaking are blamed for their own victimhood. This argument was brought to prominence when Rachel Carson (1962)

contested the safety of nonselective poisons such as DDT. She argued that human control over nature, in the form of toxic pesticides, breaks down when natural forces allow these poisons to work their way up the food chain to animals and humans. Carson (1962:43) wrote of “an era dominated by industry, in which the right to make money, at whatever cost to others, is seldom challenged.” This is an extension of an earlier argument by Adorno and Horkheimer (1944) in their critical assessment of the culture industry, in which elite interests are manufactured and propagated to pacify an exploited citizenry. Carson redirected the environmental movement toward issues of social justice by posing such moral questions as: “By acquiescing in an act that causes such suffering to a living creature, who among us is not diminished as a human being?” Harrison (2011) critiques a number of industries by exploring the sources of such acquiescence in the pesticide industry. One source of acquiescence is a utilitarian argument, based on a cost/benefit approach, with society achieving the greatest good for the greatest number of people. It suffers from the fact that, specifically with regard to the crop protection industry, “certain bodies end up bearing the burden of those decisions” (Harrison 2011:74). A libertarian argument, promoting minimal regulation of industry, encourages the proliferation of government agencies that, while tasked with regulating, more vigorously promote industries through protectionism and corporate welfare (Bennett 2017). Harrison also carefully critiques a communitarian strategy, often by publics that support justice for farm workers, but often have a limited impact, by supporting organic farming that has no just-wage component, or locavore and family-farm initiatives that have no direct knowledge of oppressive working conditions of farm workers. This discussion underscores the necessity for careful critique and reflexivity on the part of social justice advocates.

Kai Ericson's (1976) work, like Carson's, galvanized not only the general public but also the "publics-in-particular" (Brown and Perkins 1992; Michael 2009) concerned with communities whose sense of place had been disrupted by an environmental disaster. Sometimes a disruption of place security results in the physical and psychological elimination of community. This occurred in the mining communities along Buffalo Creek, West Virginia when three of Pittston Coal Company's settling ponds burst upstream, destroying "everything in its path." A government inquiry was stacked with investigators connected to and sympathetic toward the coal industry, which compounded the sense of betrayal the communities felt for the coal industry. The irrevocable consequence of coal mining by mountaintop removal follows a similar pattern of environmental injustice (Cordial et al. 2012; Scott 2010).

Disruptions to sense of place follow many other kinds of natural and anthropogenic disasters, often involving an awareness of potential hazards by vulnerable publics. These include natural disasters such as hurricanes, tornados, earthquakes, wildfires, droughts, floods, tsunamis, volcanic eruptions and landslides. These disasters lead to an uptick in poverty rates, out-migration and rising inequality for those who remain (Boustan et al. 2017). The consequences of a disaster are shaped not only by a community's resilience and coping capacity, but also by vulnerabilities in place prior to the disaster. A stark example of differences in poverty-related vulnerability is the 7.1 magnitude earthquake that struck San Francisco in 1989, killing sixty-three people, compared to the 7.0 magnitude earthquake that struck Haiti in 2010, killing more than 200,000 people. Differences in vulnerability and resilience also accompany human-caused disasters. Organized opposition to the risks generated by the nuclear power and defense industries started in the late 1960s (Kasperson et al. 1980; Rüdig 1990), followed by opposition to a wide variety of other anthropogenic hazards associated with industry, transport and health.

Government and industry often sidestep the sociocultural and environmental precautionary principle (Akins et al. 2019; Brown 2007) in favor of the management of fear (Lukaszewski 1992). It is not then surprising that there is often an erosion of social trust. This can lead to organized opposition, but it can also lead to other coping mechanisms, such as when individuals deny that change is occurring (Bonaiuto et al. 1996) or when people deny that negative impacts are possible, as evidenced by climate change skepticism (Hall et al. 2015). Occasionally a disaster can produce not only a sense of loss and grief, but also enhancement of social cohesion and feelings of optimism (Silver and Grek-Martin 2015).

Sense of place is complex and malleable, caught up with race, class, and political/economic influences (Bullard [1990] 2000). Place identity is complicated by sometimes being associated with indigeneity or with a deep cultural rootedness (Hummon 1992) that defend against the creation of environmental “sacrifice zones.” When utility infrastructure projects encroach on closely held land, inhabitants sometimes describe a sense of estrangement from their surroundings (Perry 2012), but sense of place can be difficult to articulate. Cultural or ethnic differences sometimes result in populations taking opposite sides on the question of resistance to infrastructure development (Dukpa 2018). And sometimes the loss of attachment to place is felt more strongly on a regional or even global rather than on a local level (Devine-Wright and Batel 2017). And finally, sometimes there is little opposition to large-scale development projects, even when environmental activists recognize great harm (Ishiyama 2003). The harm done by the loss of identity, dependence and attachment to a place is easily overlooked when powerful forces devalue anything that cannot be commodified (Harvey 1996:298). Opposition to environmental injustice therefore requires the articulation of vocabulary that is general enough to be meaningful

for all contending groups and specific enough to capture the unique characteristics of place that may be threatened by a hazard.

Opposition to the disruption of sense of place has been reported for a variety of hazards and disasters around the world (Kroll-Smith et al. 1997). Recent examples include opposition to windfarms in England (Burningham et al. 2015), gas pipelines in Australia, the Netherlands, Canada and the United States (Luke et al. 2018), coal mining in Australia (Albrecht 2006), mining in Latin America (Schnoor 2017), hydropower projects in India (Dukpa et al. 2018), landfill and sewage treatment facilities in Hong Kong (Liu et al. 2018), and frac sand mining in western Wisconsin (Pearson 2016). Studies typically have a shortsighted tendency to describe a hazard or disaster in terms that focus only on disruption to a human sense of place. Aldo Leopold (1968) inspired generations of environmental activists by suggesting that “We abuse land because we regard it as a commodity belonging to us.” This tendency is captured only too well by the phrase “natural resource,” taking for granted that nature is a resource with inexhaustible capacity for exploitation. Future discourse regarding the subjection of populations to infrastructure development requires a vocabulary specific enough to capture the unique biophysical and social characteristics of a local place, and general enough to situate the local in a global ecological context.

Rural Appalachia: arguments for a distinct sense of place

This research proposes that the construction and operation of a hazardous substance pipeline poses two kinds of vulnerability: danger and disruption to sense of place. With regard to the latter, how might a rural Appalachian sense of place be conceptualized? A theoretically grounded argument for a distinct rural Appalachian sense of place must necessarily provide evidence for a recognizable connection between rural Appalachian people and their Appalachian

landscape. Such an argument must be approached with hesitation, if for no reason other than to avoid uncritical romanticization or essentialist stereotyping of either the people or the region.

Batteau (1990) and others (Banks 1993; Fisher and Smith 2012:1; Jackson 2006; Lewis 2000) recognize that there are many Appalachias, despite the relentless fashioning, inventing, and fictionalizing of a general Appalachian identity (Eller 1988). Appalachia is neither culturally nor geophysically homogenous, notwithstanding the questionable (Strickland 1999; Watts 1978; Weaver 2016) spatial boundaries established by the Appalachian Regional Commission (ARC 2019) or the definition of “rural” established by the U.S. Census Bureau (Ratcliffe et al. 2016). Just as Appalachia’s geopolitical boundaries have not been “self-fashioned” by insiders, Gottlieb (2001) and others argue that cultural descriptions of Appalachia are often similarly constructed by outsiders. For example, Gottlieb (2001:354) concluded an investigation into the regional identities of West Virginia college students by arguing that their “discursive practices,” to use Foucault’s (1977) terminology: their rules that regulate their discourse, drew on a cultural repertoire imposed by the outside world. They articulated an identity with the mountains that was, to borrow Apple’s (1998: xi) terminology, “historically conferred.” For those students, as with many others within and outside Appalachia, “mountains” are, in Gottlieb’s reckoning, “a major trope of regional identity” (2001:349), even though the region is not entirely mountainous.

Notwithstanding the cultural categories imposed by others, the students that Gottlieb interviewed freely adopted what Edwards (1999: 288) would describe as emotion categories in a situated discourse. Wagner (1999:243-244) isolated such categories as “*home, farm, road, school, county, place, family, people, live*” that describe human habitation, as well as “natural labels such as *mountain* and *creek*.” These emotional categories are specifically situated in a local frame. Home, farm, and family are part of what Allen (1990) calls the “genealogical

landscape”, which describes the rootedness that connects people to the land. Hay (1998) adds the presence of ancestral ties to the land. I argue that the genealogical landscape is an important element in a repository for a culture of survival, similar to the role Paquet (1990:499) describes for folklore. Wagner’s (1999) study demonstrated the inadequacy of a utility project’s environmental assessment that failed to recognize rootedness as a repository of local power. I argue that when a population does not have a recognizable genealogical landscape, that population is more socially vulnerable to the stresses imposed by a hazard, and that population will also have less social resilience following a disaster.

Barbara Ellen Smith (2002:43) argued that global capital cares little for Appalachia or any other place it destroys. There is little to gain by speaking of “the internal colony” or a “sacrifice zone,” because it strengthens the hand of capitalist interests by tending to normalize destruction as much as it tends to oppose it (Billings Norman and Ledford 1999). Drawing a bright line separating Appalachia from “the other” is like any other insider/outsider binary: it discourages common cause, which works to the advantage of global neoliberal forces (Appadurai 1996:32-33; Satterwhite 2010:72; Smith 2002:45). If, as Fisher (2012:59) says, “being Appalachian means something different depending on who you are,” then it is also the case that “the act of partitioning off continuous space into discrete components allows users to abstract away from some innumerable complexities and heterogeneities that otherwise stand in the way of describing, explaining, predicting, and controlling parts of the real world (Weaver 2016:52). Appalachia should not be fetishized as a place apart from the rest of America or the world. It never was the other.

William Kapp (1971) and others (Amin 1974; Frank 1969; Wallerstein 1974) long ago recognized those who bear the unpaid costs levied by capitalism. Social scientists recognize

these burdens in the dark value associated with the textile, agricultural, and mining industries of the global south (Clelland 2014; Dunaway 2014). In the United States the people of Appalachia have borne more than their share of that cost. But the claim of victimhood is not a source of strength, and it is strength that is needed if concerned publics are to offset the interests of industrial and state agencies. Ron Eller (1999: xi) suggested taking “an important initial step toward self-determination – toward empowerment and the ability to shape an alternative future.” The purpose of this research is then to interrogate some of the “innumerable complexities and heterogeneities” that can shape that alternative future. Hazards expose vulnerabilities, but they also expose capacities for resilience that challenge state and corporate authority. Vulnerability and resilience are conceived here as expressions of power, which, according to Foucault (1980, 1983) is dispersed, exercised, unpossessed, unstable and localized. Foucault said that resistance is power, and ‘emotion talk’ is one expression of power relations (Foucault 1977). My view is that the social construction of risk may involve the exercise of localized, shared emotion talk in acts of resistance to power.

Relph (1976) and Tuan (1977) articulated a socially constructed connection between people and their environment. They understood that space is transformed into place through human residence and involvement. That insight led Relph (1976: 49) to describe a fundamental human dialectic between insideness (safe, enclosed, at ease) and outsideness (threatened, exposed, stressed). Relph said, “To have roots in a place is to have a secure point from which to look out on the world...” Insideness in the sense of rootedness is always and everywhere local and personal. It should not be confused with the common but essentializing characterization of Appalachia as a region. In my view this localized sense of place is appropriate when it ties specific people and groups to a specific local environment. Sense of place is a public good

(Holcombe 1997), as much of a cost-free resource in the face of hazard or disaster as when it is deployed in confrontation with toxic capitalism. The questionnaire and interviews that are part of this research may provide evidence that property owners' genealogical landscapes and their emotional attachment to local places are sites of resistance when shared with family, neighbors, and concerned publics. Other variability associated with age, education, employment, income, race, physical distance from the pipeline and other indicators of social or physical vulnerability or resilience may also mediate the relationship between disaster and risk. Data from respondents in a survey of western North Carolinians suggest that people hold multiple, nested identities (Cooper et al. 2010: 30), and that those who are older, more educated, have lived a greater part of their life in the area, or are white are more likely to identify as Appalachians (Cooper et al. 2010:32). Interviews may also reveal social and cultural influences: norms, values, and community ties that serve as indicators of social solidarity (Friedman and McAdam 1992:161). Howell (2002: 11-12) argues that for the Appalachian South the intangible qualities of sense of place are best captured by how people talk about their perceptions, feelings, and values. Interviews with Western Virginians may similarly reveal the intangible qualities of people's sense of place that serve as resources in the production of risk.

E. Summary and critique of MVP documents and anti-pipeline activism

Summary and characterization of the MVP project by pipeline authorities

The primary source for this overview of the Mountain Valley Project (MVP), proposed by Mountain Valley Pipeline LLC (Mountain Valley; "applicant"), is the Final Environmental Impact Statement (FEIS), which combines the Mountain Valley Project and Equitrans Expansion Project: FERC/FEIS-0272F, dated June 2017, cited as FERC/FEIS (2017b). The primary background document for the MVP project in the FEIS is FERC Docket Number CP-10-000

(2017a). The Federal Energy Regulatory Commission (the FERC or Commission) “is the lead federal agency responsible for authorizing interstate natural gas transmission facilities under the Natural Gas Act and is the lead federal agency for preparation of this EIS in compliance with the requirements of NEPA [National Environmental Policy Act]” (FERC/FEIS 2017b: ES-1). The intent of this section is to adhere as closely as possible to sections of the written document that summarize and characterize the impact of the project, often by quoting directly from the document. The summary is a review of the scope and specifications for the project, and the characterization reviews the project’s anticipated impact on the natural and human environment. A follow-up section reviews how concerned publics frame their opposition to the characterization of the project by the pipeline developer and state agencies. Individuals and contending groups that support or oppose the pipeline project frame their arguments using language from the document. Therefore, it is important to summarize and characterize salient points made in its 970 pages.

Summary

The Mountain Valley Pipeline (MVP) project involves the construction of a 42” natural gas pipeline extending about 304 miles through 11 counties in West Virginia and 6 counties in Virginia (FERC/FEIS 2017b: 2, 4-348). The 2016 existing estimated population levels for these counties are 1,831,102 in West Virginia and 8,411,808 in Virginia (FERC/FESI 2017:4-348). If completed, the pipeline would transport “about 2 million dekatherms per day (Dth/d, equivalent to about 2.0 billion cubic feet per day [Bcf/d] of contracted volumes of natural gas” (FERC/FEIS 2017: ES-1). “The maximum allowable operating pressure (MAOP) for the new [MVP] pipeline would be 1,480 pounds per square inch gauge (psig)” (FERC/FEIS 2017b: 2-9). “In the event of

an incident, an electronic command for valve closure can be sent, with the MLV [mainline block valve] closing within 2 minutes following issuance of a remote signal.” (FERC/FEIS 2017b: 2-15). There are 36 MLV sites along the route.

Easements, either temporary for use only during construction, or permanent, giving the right to operate and maintain the pipeline, must be obtained by all natural gas companies (FERC/FEIS 2017b: 4-308). The FERC urges pipeline developers to negotiate easements from landowners prior to construction. Mountain Valley Pipeline applied to the FERC and was granted approval to use eminent domain, through a Certificate of Public Convenience and Necessity. Mountain Valley Pipeline “may use the power of eminent domain under Section 7(h) of the NGA, [Natural Gas Act] to acquire an easement.” (FERC/FEIS 2017b: 4-309). Easement agreements can include indemnification language to protect landowners from damage during construction or operation of the pipeline. A local court, rather than the landowner, MVP, or FERC, decides the value of easements when eminent domain is used by MVP to obtain an easement, and a local court also decides compensation for damages during or after construction (FERC/FEIS 2017b: 4-393). The Mountain Valley Pipeline “would generally use a 125-foot-wide construction right-of-way to install the pipeline in uplands and a 75-foot-wide construction right-of-way through wetlands.” (FERC/FEIS 2017b: 2-23). “Construction of the MVP pipeline would affect about 5,120 acres; affecting 3,349 acres in West Virginia and 1,771 acres in Virginia.” (FERC/FEIS 2017b: 2-24). “Following construction, Mountain Valley would retain a 50-foot-wide permanent right-of-way to operate the pipeline. Operation of the pipeline would affect a total of about 1,846 acres, including 1,190 acres in West Virginia, and 656 acres in Virginia” (FERC/FEIS 2017b: 2-24). “There would generally be 36 inches of cover over the top of the pipeline in deep soils and 18 inches of cover in areas of consolidated rock.” (FERC/FESI

2017b: 2-38). The pipeline itself is “constructed of steel and installed underground for their entire length...” (FERC/FEIS 2017b: 1-49). The pipe is coated with a fusion-bonded epoxy material that, together with cathodic protection, inhibits corrosion (FERC/FEIS 2017b: 4-570).



Source: Roanoke Times Jan. 22, 2018, article by Laurence Hammack. Used with permission.

Figure 1: Proposed Route of the Mountain Valley Pipeline

The FEIS includes responses to comments made by the public during the scoping phase. Regarding the purpose and need for the project, “Mountain Valley states in its application that it did not design its facilities to transport natural gas to an LNG export terminal.” (FERC/FEIS 2017b: 1-8). Its markets, instead, would be in the Northeast, Mid-Atlantic, and Southeastern United States (FERC/FEIS 2017b: ES-2). Commission staff also acknowledged the receipt of comments suggesting that the MVP would lead to additional exploration and production of natural gas from the Marcellus shale region, which “according to some” may result in more hydraulic drilling or “fracking.” Staff concluded, “While we know generally that natural gas is produced in the Appalachian Basin, there is no reasonable way to determine the exact wells

providing gas transported in the MVP and the EEP pipelines, nor is there a reasonable way to identify the well-specific exploration and production methods used to obtain those gas supplies” (FERC/FEIS 2017b: 1-26).

Characterization

This section characterizes anticipated impacts to the natural and human environments. The National Environmental Policy Act (NEPA) requires that FERC’s Environmental Impact Statement (EIS) consider the potential effects of the proposed project, whether “ecological ... aesthetic, historical, cultural, economic, social, or health, whether direct, indirect, or cumulative” (40 CFR § 1508.8 b). The FERC’s 930 page Final Environmental Impact Statement (FEIS) was issued in June 1917 and construction began in February 2018. The FEIS asserts that if the pipeline developer follows its recommended measures, there would be minimal or insignificant impacts to natural and human environments, with statements such as this:

Given the project BMPs [best management practices] and design features, mitigation measures that would be implemented, federal and state laws and regulations protecting resources, and permitting requirements, we conclude that when added to other past, present, and reasonably foreseeable future actions, the MVP [Mountain Valley Pipeline] and the EEP [Equitrans Expansion Project] would not have significant adverse cumulative impacts on environmental resources within the geographic scope affected by the projects. (FERC/FEIS 2017: 4-622).

The overall safety of the pipeline is characterized by this statement: “The available data show that natural gas transmission pipelines continue to be a safe, reliable means of energy transportation.” (FERC/FEIS 2017b: 4-573). More specifically, the Executive Summary asserts, “There is no evidence that the projects would cause significant adverse health or environmental harm to any community with a disproportionate number of minorities, low income, or other

vulnerable populations.” (FERC/FEIS 2017b: ES-11). The emphasis on vulnerability in the present research will test the accuracy of that assertion. The Executive Summary also notes that the construction would have temporary impacts on local populations and housing. “The projects would mitigate for impacts on low income communities through temporary employment opportunities, spending on commodities, and generation of tax revenues that would stimulate the local economy.” (FERC/FEIS 2017b: ES-11). FERC staff writes that “Multiple studies indicate that the presence of a natural gas pipeline would not significantly reduce property values.” (FERC/FEIS 2017b: ES-11). Furthermore, “We are unaware of an example where an insurance company considered the presence of a pipeline when underwriting homeowner policies.” (FERC/FEIS 2017b: ES-11). Impacts to air quality and noise levels would be temporary, local, and insignificant (FERC/FEIS 2017b: ES-13-14). General safety would be implemented with Mountain Valley’s emergency response plan, including procedures for communicating with emergency services departments, prompt shutdown, logistics, and notifications. “We [FERC staff] conclude that the Applicants’ implementation of the above measures would protect public safety and the integrity of the proposed facilities.” (FERC/FEIS 2017b: ES-13).

Danger is mainly mentioned with reference to federally listed threatened, endangered or other species of concern (FERC/FEIS 2017b: ES-7; 1-40; 4-226). Staff concluded that the MVP “*would not significantly impact* [italicized in the original] all 20 of these [endangered] species.” (FERC/FEIS 2017b: ES 9). FERC staff evaluated alternatives to the project, considering both natural and human environments (FERC/FEIS 2017b: 3-3). “The human environment includes landowners, residences, utilities, and industrial and commercial development near construction workspaces. (FERC/FEIS 2017b: 3-3). FERC staff asserted that “the no action [do not authorize or construct the MV pipeline] alternative would offer a significant environmental advantage.”

(FERC/FEIS 2017b: 3-4). Four levels of impact duration were considered: temporary (during construction), short-term (up to 3 years), long-term (more than 3 years), and permanent (more than 50 years) (FERC/FEIS 2017b: 3-121). Significant impacts were defined as resulting in “a substantial adverse change in the physical environment” (FERC/FEIS 2017b: 4-1). It is unclear whether this includes the human environment. The endangerment of public health and welfare by greenhouse gases, along with their contribution to climate change, was limited to impacts occurring during construction and from “fugitive methane leaks from the pipeline and aboveground facilities.” (FERC/FEIS 2017b: 4-488).

Specifically with regard to disruption to the human environment, the FEIS concludes that the project “would not have a significant adverse effect on the socioeconomic conditions of the project area” (FERC/FEIS 2017b:5-11). Rather, “The long-term socioeconomic effect of the projects is likely to be beneficial due to the increase in tax revenues” (FERC/FEIS 2017b:5-11). Disruption, when mentioned, is limited to the disruption of agricultural production (FERC/FEIS 2017b: 4-475), soil disruption due to trenching and backfilling (FERC/FEIS 2017b 4-502), the disruption of springs (FERC/FEIS 2017b: 4-603), disruption for hikers on the Appalachian Trail (FERC/FEIS 2017b: 3-51), possible disruption to stream gages from construction activities (FERC/FEIS 2017b: 4-129), and disruption to water supplies during construction (FERC/FEIS 2017b: 4-142). A Cultural Attachment Report, by a professional cultural anthropological consulting firm, submitted a study that was limited to a six mile section of Peter’s Mountain, between mileposts 194 and 200, in Monroe County, West Virginia and Giles County, Virginia (FEISb:4-472), out of the entire 304 miles of the project. Shared values of local residents, interviewed by the researchers, included “sense of homeplace, land ownership, kinship and neighborhood relations, sharing of resources, self-sufficiency, slow-paced lifestyle, and water

quality.” (FERC/FEIS 2017b:4-474). Potential impacts to a community’s *sense of place* are mentioned only once in the EIS (FERC/FEIS 2017b:4-474): “An assessment of cultural attachment is not required by any federal laws or regulations relating to historic preservation and cultural resources management. Analyzing cultural attachment or a community’s sense of place is one of many ways to identify potential impacts to the tangible and intangible values of culture associated with the physical environment.” Although staff agreed with the opinion of the researchers that “Peters Mountain could be considered a rural historic cultural landscape” (FERC/FEIS 2017b: 474), “no alternatives around Peters Mountain are recommended.” (FERC/FEIS 2017b: 4-474). The FEIS noted concerns regarding cultural attachment expressed by residents, but concluded that “construction and operation of the MVP should not have long-term significant adverse effects on cultural attachment to the land, because it would not change land ownership, lifeways, economic activities, cultural practices or beliefs, and effects on most environmental resources (such as impacts on air quality, water quality, and farmland soils) would be reduced or mitigated through measures implemented by Mountain Valley.” (FERC/FEIS 2017b: 477).

The 622 pages of the FEIS’ environmental analysis section of the statement included 135 pages concerned with the human environment, labelled as “Socioeconomics.” The Socioeconomics section is mostly descriptive, except for subsections 4.9.2 and 4.10.10, which together total 28 pages. In addition, the section on construction methods does state that “construction work areas would be within 50 feet of 118 residential structures for the MVP.” (FERC/FEIS 2017b: 2-47). Reliability and safety are addressed in section 4.12, arguably also concerning the human environment. FERC staff state that the probability of fatality from an incident is approximately 0.01 per year per 1,000 miles of pipeline (FERC/FEIS 2017b: 4-573).

That is to say that there is approximately one death per year for every 100,000 miles of pipeline. “Thus, operation of the projects would represent only a slight increase in risk to the nearby public.” (FERC/FEIS 2017b: 4-573). “During the 20-year period from 1997 through 2016, a total of 1,367 significant incidents were reported on the more than 301,000 total miles of natural gas transmission pipelines nationwide (PHMSA, 2017)” (FERC/FEIS 2017b: 4-569). Of those incidents 51 percent were the result of corrosion and pipeline material, weld, or equipment failure (FERC/FEIS 2017b: 4-569). Safety standards, including more rigorous standards for more densely populated areas, are included in Section 4.12.1. That same section makes reference to particularly vulnerable populations described in Section 4.9, particularly 4.9.1.8. This section requires the scrutiny and consideration of vulnerabilities related to racial and economic composition of affected communities, health issues, and recommends the protection of “other vulnerable populations in the project areas including children, the elderly, disabled, non-English speakers, and other disadvantaged people that may be disproportionately affected by the projects.” (FERC/FEIS 2017b: 4-377).

Section 4.12.1, the section addressing safety standards, includes standards for risk in all High Consequence Areas (HCAs). The DOT has published rules by which HCAs can be determined by either of two methods (see DOT 2016 for a recent advisory bulletin). “Both methods require the operator to determine “identified sites” [where people regularly gather or live; see DOT 2016:90063 or 49 CFR 192.903 in PHMSA’s IM regulations for specifics] and calculate a PIR [Potential Impact Radius], using a formula to calculate the radius of a circle within which the potential failure of a pipeline could have significant impact on people or property (DOT 2016: 90063). This PIR is commonly known as the *blast zone* or incineration zone, “the distance at which there is a reasonable risk of incineration, injury, or even death...”

(Paranjape et al. 2017:2). The PIR is the radius of the potential impact circle (PIC). “The PIR for the 42-inch-diameter MVP with a MAOP of 1,480 psig is 1,115 feet.” (FERC/FEIS 2017b: 4-560). Method 1 requires the calculation of class locations, based on population density, along with the potential impact radius (PIR) and occupancy within a specified “identified site” (FERC/FEIS 2017b: 561). Most intrastate and small operators have transitioned to Method 2 (DOT 2016: 90063), in which the HCA is any location within a PIR with an identified site or 20 or more buildings intended for human occupancy (FERC/FEIS 2017b: 4-562). To summarize, High Consequence Areas are segments of a pipeline system “that pose the greatest risk to human life, property, and the environment...” (DOT 2016: 90062).

The framing of claims regarding environmental impact

On October 13, 2017, the FERC granted the certificate of authorization requested by Mountain Valley Pipeline. One of the three commissioners wrote a 5-page dissent, arguing, among other considerations, that the need for the pipeline “may be met through alternative approaches that have significantly fewer environmental impacts.” (FERC 2017b: Dissenting Attachment: 3). This dissent is consistent with Executive Order 12989, which mandates that all federal agencies consider environmental justice issues in their activities. The range of claims by contending groups can be summarized in the FERC’s own language:

Numerous entities and individuals filed comments and protests regarding various issues, including project purpose and need; project alternatives; geological hazards; water resources; wetlands; forested habitat; wildlife and threatened, endangered, and other special status species; land use, recreational areas, and visual resources; cultural resources; air quality and noise impacts; and safety.” (FERC 2017b: 10).

A natural gas pipeline, like other potential sources of environmental harm, is highly contested. Pipeline developers and government agencies generally emphasize its benefits and the public

emphasizes its costs (Phillips 2015; White 2013). Regarding costs, environmental justice groups often fail to recognize certain “veto points”, when claims of harm could effectively influence the political fate of a contentious project (Hoberg 2013). Environmental justice strategists often advocate for the precautionary principle (Bullard 2005:28), which asks, ‘How little harm is possible?’ rather than ‘How much harm is allowable?’” Not surprisingly, impacted publics generally support public policy that errs on the side of safety and wellbeing rather than development. One theorist organizes environmental opposition in the following way: “Environmental justice (concerned with humans) constitutes one strand of an eco-justice perspective that also includes ecological justice (concerned with nature and specific environments) and species justice (concerned primarily with nonhuman animals)” (White 2015: 51). Environmental justice, then, “refers to the equitable distribution of environments among peoples in terms of access to and use of specific natural resources in defined geographical areas, and the impacts of particular social practices and environmental hazards on specific populations.” (White 2015: 51). The proposed research, with its focus on harm to humans, is firmly within the environmental justice strand of the eco-justice perspective but recognizes its placement within larger spheres of contention.

The foregoing summary and characterization of the MVP project by pipeline authorities may convey a sense of the potential harm imposed on those whose properties are in the path of a pipeline. Aside from the danger and disruption that are the focus of this research, citizens in the counties crossed by the pipeline, whether their properties are within or outside the blast zone, may report broader sources of harm. For example, pipeline critics argue that FERC is a regulator held captive by large energy companies, having rejected only two pipeline projects in the past 30 years (Lombardi and Hopkins 2017). According to these same authors, “at every turn, the

agency's process favors pipeline companies," citing interviews with more than 100 people and reviews of nearly 500 FERC pipeline cases. Some environmental justice scholars claim that "with the exception of blocking new projects and preventing the expansion of existing projects, the movement has not improved the environmental quality for vulnerable populations" (Pulido et al. 2016:1). "Companies given certificates to build by FERC gain a powerful tool: eminent domain, enabling them to proceed whether affected landowners cooperate or not." (Lombardi and Hopkins 2017). Pipeline opponents argue that eminent domain, when imposed, allows a pipeline developer to intrude on private property for a non-public use. David Harvey (2005:178) might characterize such a taking of private property for a non-public purpose as an "accumulation by dispossession": "Dispossession entails the loss of rights. Hence the turn to a universalistic rhetoric of human rights, dignity, sustainable ecological practices, environmental rights, and the like, as the basis for a unified oppositional politics." I argue that the imposition of eminent domain is a dispossession of place, to the extent that landowners may feel removed from the sense of safety, identity, dependence, and attachment that they associate with their private property.

The FERC discussed alternative modes of natural gas transportation. Among those is liquefied natural gas (LNG) vessels, used for export to foreign customers. If MVP natural gas is shipped offshore, it would clearly have a private benefit for corporate shareholders, but no direct benefit to the public. This is the FERC's (FERC/FEIS 2017: 3.5-3.6) statement regarding LNG as a mode of transportation for MVP gas: "We conclude that transporting Mountain Valley's proposed volumes by LNG vessels would not provide a significant environmental advantage and is not technically feasible and practicable." A recent letter (McKinley et al. 2022) from both West Virginia Senators and two Congresspersons, arguing for a four-year extension for

completion of the pipeline, suggests a more expansive conclusion: “The United States is a world-leader in natural gas production, and as the conflict in Ukraine continues, the United States should use every tool at its disposal to make up for the shortfall in the global natural gas supply for our allies and trading partners. Natural gas produced in the Appalachian Basin is undoubtedly part of that solution.” This statement seems to amplify the use of eminent domain law when the expansion of global natural gas supply is considered a public use. The seemingly alarmist argument for the role that natural gas must play in the face of this global military crisis recalls a similar argument for an electrical transmission line through the same region of Appalachia in 1998:

How APCo [Appalachian Electric Power] can simultaneously tell its customers that the APCo transmission system is poised on the brink of brownouts and blackouts and then agree to sell an additional 200 million watts... to North Carolina across the same transmission system is clearly hypocritical... or APCo is adding additional load so their shareholders profit from off-system sales, while putting transmission to their current rate-payers at risk,” said COPE activist David Brady. (cited by Carlisle 1999:243).

In both cases eminent domain law is justified by questionable interpretations of public use.

Another broader source of harm involves the inadequate discussion of the pipeline’s potential economic impacts, as demonstrated by an economic impact analysis of the MVP conducted by Phillips, Wang, and Bottorff (2016). The final EIS concludes that the pipeline “would not have a significant adverse effect on the socioeconomic conditions of the project area” (FERC/FEIS 2017: 5.1.9, 5-10). Among the cited reasons for this conclusion are that “multiple [previous] studies indicate that the presence of a natural gas pipeline would not significantly reduce property values” (FERC/FEIS 2017b 5.1.9, 5-10). However, Phillips, Wang, and Bottorff (2016) call into question the validity of these cited studies, noting significant methodological flaws. The EIS also claims that the authors are “unaware of an example when an insurance

company considered the presence of a pipeline when underwriting homeowner policies.”

However, a 2016 *Roanoke Times* article documents local instances in which insurance companies did, in fact, tell homeowners that a natural gas pipeline on their property would change their coverage (Adams 2016). Furthermore, emerging case law supports the admissibility of evidence for “fear in the marketplace” as a factor that can depress property value (Bolton and Sick 1999). As Phillips, Wang, and Bottorff (2016) point out, FERC’s own policy, 88 FERC para 61, 227 requires that the “economic interests of landowners and communities affected by the route of the new pipeline” must be weighed against the “evidence of public benefits to be achieved” if the pipeline is constructed. These critics believe that the absence of a thorough assessment of actual economic impacts, prior to and following construction, leaves a gap in our understanding of the socioeconomic consequences of natural gas pipelines. A large study of wind power projects in the United States (Firestone et al. 2018) found that residents considered projects to be ‘fair’ when developers were perceived as being open and transparent. The MVP developer might have generated a more positive attitude by impacted landowners if it had focused more attention on this finding.

A final example of a broader source of harm that may emerge in the interviews is the social cost of carbon, which the Environmental Protection Agency defines as “a measure, in dollars, of the long-term damage done by a ton of carbon dioxide (CO₂) in a given year (EPA:2017), and which Phillips (2017:33) defines as “the comprehensive estimate of the economic cost of harm associated with the emission of carbon.” Particularly for property owners who are outside of the blast zone this may be a greater source of risk than either danger or disruption, and a stronger predictor of support for pipeline opposition.

These three broad-scale sources of contention for property owners in the pipeline counties: public concern with government overreach in the application of eminent domain, concern with economic harm to property values, and the harm associated with the emission of carbon are well recognized in the scholarly literature. They did not, however, merit much attention in the FEIS. The harm imposed by an increase in a population's sense of danger and the harm to a population's sense of place are similarly underrecognized by hazardous pipeline developers and other entities that expose publics to anthropogenic hazards. A single reference mentions "sense of place" as "one of the many ways to identify potential impacts to the tangible and intangible values of culture associated with the physical environment." (FERC/FEIS 2017b: 4-473), with no further discussion or action. This lack of attention is striking for two reasons. First, the FERC states, "An assessment of cultural attachment is not required by any federal laws or regulations relating to historic preservation and cultural management." (FERC/FEIS 2017b: 4-474). However, "Under EO [Executive Order] 12898, executive branch agencies were directed to make EJ [Environmental Justice] an integral part of their missions and to establish an EJ strategy." (DOE 2017: 5). Furthermore, "EJ is not an outcome, but a process. It seeks to ensure that all persons enjoy the same degree of protection from environmental and health hazard" (DOE 2017: 10). Clearly, property owners in or near hazardous material pipelines do not enjoy¹ the same degree of protection from environmental and health hazards as all other persons. The emphasis on differences in vulnerability in the present research will challenge whether residents exposed to pipelines enjoy the equal protection that the DOE seeks to ensure. A second striking

¹ One informal indicator of property owners' displeasure with the way the Mountain Valley Pipeline has disregarded the concerns of property owners is the 590 emails sent to concerned citizens through one email listserv (Lynda Majors, from 3/15/18 to 11/8/18).

absence relates directly to sense of place. Scholars argue that violations to a sense of place are fundamental to the mobilization of resistance (Altman and Low 2012; Fisher and Smith 2012; Martin and Miller 2003). Engineers and corporate actors may have a utilitarian bias for commodifying the environment, and therefore discount or ignore values that are not easily monetized. More attention to such critical sources of harm to vulnerable populations might spare developers from considerable and entirely predictable pushback by concerned publics¹.

F. Social representations theory

Project developers, governing agencies, and impacted publics have little shared understanding of the process by which the public proceeds from its initial awareness of an energy infrastructure project to its ultimate response. The case study for this research uses a conceptual framework that organizes that process. Social representations theory provides a structure that it is intuitively comprehensible to researchers, policymakers, project developers, and impacted publics. One aim of this research is to investigate how landowners make sense of two factors that may be particularly salient for pipeline communities: first, danger, and second, disruption to their attachment, dependence, and identity in the places they call ‘home’. These factors may help inform the decisions of stakeholders by differentiating public response to sites of energy production from sites of energy transmission.

Social representations

Social representations theory (SRT), originally formulated by Serge Moscovici ([1976] 1981), is particularly well suited for gaining insights into the process of sense-making that occurs when individuals and groups confront unfamiliar social phenomena (Rateau and Moliner 2012). A social representation is formed, communicated, and negotiated in a dialogue (Howarth 2006:693) that translates “sociocultural and cultural conditions into individual dispositions”

(Wagner and Hayes 2005:310). Smith and Joffe (2012:17) summarize early discussion regarding the formation of a social representation by suggesting that “people use a range of symbols, metaphors and iconic images that circulate in their socio-cultural context to inform their apprehension of unfamiliar risk issues.” The theory has recently been used as a framework for exploring attitudes toward environmentally contentious development projects (Anderson et al. 2017; Ashmoore et al. 2016; Batel and Devine-Wright 2015; Bergquist et al. 2020; Bugden et al. 2017; Chen 2019; Devine-Wright 2009; Devine-Wright and Batel 2017; Evensen et al. 2014; Smith and Joffe 2012). These studies seem consistent with the ecological-symbolic perspective proposed by Kroll-Smith and Couch (1991, 1993) that “pre-existing relationships with built, modified, and biophysical environments strongly influence how individuals, groups, and communities interpret and respond to environmental trauma” (Gill and Ritchie 2018:48).

Interpretations of novel events use aspects of an “already known” (Joffe 2003:61), similar with the “taken for granted ‘reality’” at the core of Berger and Luckmann’s (1967:15) sociology of knowledge. Social representations are “common sense”, meaning that they reflect the collective sense of what a population already knows and believes (Evensen et al. 2014:66), without concern whether it seems false, biased, inconsistent, or in any other way deficient (Bauer and Gaskell 1999; Martinez 2018:6). Moscovici’s (1984:29) approach to the ambiguity and uncertainty of a novel event, such as the pipeline project at the center of this study, is to render it comprehensible through a two-step mechanism or process, “based on memory and foregone conclusions.” The first part of the process *anchors* a social representation (of a pipeline project, for example) to pre-existing values, belief, and ideologies (Rateau and Moliner 2012:483), so that it “re-presents” an existing social object (Howarth 2004:4). In this study, “danger” (Douglas [1966] 1984, 1992; Rosa 1993:64; Slovic 1999; Smith and Joffe 2012) and “disruption to one’s

sense of place” (Relph 1976; Tuan 1977) are re-presented from pre-existing knowledge, values, beliefs, and ideologies. Evensen et al. (2014:70) suggest that the assignment of valence (positive, negative, or neutral) is an important part of the anchoring process. The anchoring knowledge, value, belief, or ideology may, in other words, be used as a source of contrast as well as comparison. The anchor, thus interpreted, is then *objectified* in the form of a shared, simplified evaluation of the novel social object. Devine-Wright (2009) was among the first to use SRT to frame the centrality of social processes during episodes of environmental disruption. During a gradual change, he theorized a process in which individuals and groups “become aware of, interpret and respond to potential change” (2009:429). Castro and Batel (2008:493-494) argue that the coordination of these competing notions is a daily achievement, elaborated through concrete dialogic interaction. One aim of this research is to seek evidence that differing representations among pipeline property residents are associated with support, opposition, quiescence, acquiescence, or indifference to the pipeline project.

Moscovici (1961) broke with Durkheim’s conception of the ‘collective representation,’ a product of an entire society, by proposing what he called the ‘social representation.’ Ratau and Moliner (2012:481) write that “representations are not the product of society as a whole, but the products of the social groups who build this society.” Neither are they a product generated exclusively at the level of the individual. Howarth (2006:693) underscores this by distinguishing between an ‘attitude’: “an opinion, or group of opinions, held by an individual about a specific object,” and social representations, which are formed, communicated, and negotiated in dialogue with others (2006:695). Wagner and Hayes (2005: 310) emphasize social over individual processes by arguing that “social representations are the mapping of this collective characteristic on to an individually accessible disposition that is distributed or shared across a group.” A social

representation is therefore a recognition that the formation of new knowledge is a social accomplishment, rather than the product of isolated individual cognition. Howarth (2006:704) notes that this recognition of social accomplishment often runs counter to the cherished Western emphasis on individuality.

Jaspers and Fraser (1984:104) argued long ago that social representations “are social because they are shared by many individuals and as such constitute a social reality which can influence individual behaviour.” As to what representations do, Moscovici (1984:24) himself wrote in one of his first texts translated from French to English, “I shall have to expose, without more ado, an intuition and a fact I believe to be true, that is that *the purpose of all representations is to make something unfamiliar, or unfamiliarity itself, familiar.*” Smith and Joffe (2013:17) summarize early discussion regarding the formation of a social representation by suggesting that “people use a range of symbols, metaphors and iconic images that circulate in their socio-cultural context to inform their apprehension of unfamiliar risk issues.” So, through communication social representations are intrinsically social, and they function specifically to make sense of novel phenomena. This perspective is appropriate for the present research, in which groups make sense of a pipeline project, which is a new object in their environment. Furthermore, this novel object may pose an environmental risk. According to Joffe (2003:60), “Although not strictly restricted to the risk sphere, social representations theory is particularly useful for it, since it is oriented towards exploration of explanations that arise in the face of new events (Hewstone and Augoustinos, 1998).” Similarly, “according to [Moscovici], the emergence of a social representation always coincides with the emergence of an unprecedented situation, unknown phenomenon, or unusual event (Rateau and Moliner 2012: 482). Research on the formation of attitudes toward energy infrastructure projects similarly argue that “top-of-mind

associations are mental representations of an issue” (Clarke et al. 2015). The pipeline is one such project.

Smith and Joffe (2013:28) stress that “...it is only through communication that a novel object can be said to have a social reality.” As conclusions about the characteristics of novel phenomena are shared, Martinez (2018:3.8) argues that “subjects often leverage prejudgments on the subject so that it conforms to ‘norms or social or individual preferences’ (Moscovici 1961/1976/2008:172-173).” Social representational responses to new environmental technologies, for example, are “co-constructed, relational, contextual, dynamic and rhetorical meaning-making, rather than as individual endeavors, that is, individual, cognitive and universal information-processing tasks” (Batel and Devine-Wright 2015:16; see also Bateau 1997:40). Representations may reflect an affected public’s understanding of “complex, scientific phenomena, generated in the public sphere and reliant on the history, culture, and social structure of the context in which they emerge” (Evensen et.al. 2014:66). The preceding discussion reveals the intent of Moscovici and others that the construction of social representations be construed as an intrinsically social phenomenon.

The production of everyday knowledge to achieve common-sense understanding

Social representations theory asserts that people rely upon familiar, everyday experience to make sense of novel, unfamiliar, and uncertain information (Smith and Joffe 2013:28). Joffe (2003:59-60) argues, “For Moscovici (2000), perception has primacy in less social branches of psychology, but representation has primacy in a social psychology of common sense. While perception is based upon sensorial knowledge, representation is concerned with symbols, social reality and social knowledge.” Moral outrage as a response to risk is one common example of such a representation in mass media. Media representations of risk tend to simplify and

sensationalize, transforming scientifically calculable risk into marketable content. But Joffe (2003: 61) cites evidence that “lay thinkers bring aspects of an ‘already known’ to their understanding of media content”, thereby tempering the content with common sense. This is similar to the “taken-for-granted ‘reality’” at the core of Berger and Luckmann’s (1967:15) sociology of knowledge. Evensen et al. (2014:66) say that “for something to be common sense, it must be intelligible in light of what an individual or population already knows and believes.” Jovchelovitch (2008b:432) traces the achievement of common-sense understanding back to Moscovici and Freud, both of whom “challenged the sovereignty of the rational subject and pointed to the antinomies embedded in human reason.” Hannah Arendt developed a similar argument that pits science against common sense. “What since Thomas Aquinas we call common sense, the *sensus communis*, is a kind of sixth sense needed to keep my five senses together and fit the sensations of my private senses into the common world of shared others (Arendt 1971:50). The ‘common’ in ‘common sense’ is thereby a recognition that everyday knowledge is a shared, social phenomenon. This is not to argue for the superiority of common sense over science. The error of that kind of thinking is illustrated by the classic example of how AIDS became ‘plague’ before its characteristics were scientifically understood (Smith and Joffe 2013). Joffe (2003:68) argues in an article on risk perception that “SRT’s interest is not in whether a response to risk is correct or erroneous. The concern is not with whether it is false, weak, biased, or in any other way deficient (Bauer and Gaskell, 1999).” The concern is rather with why a specific social representation is created, given that the general objective is to “make usual and actual something which is unfamiliar or which gives us a feeling of unfamiliarity,” “...that which was far away seems close at hand; that which seemed abstract becomes concrete and almost normal” (Moscovici 1984:27). Moscovici developed a rich vocabulary for studying the process by which

a novel event becomes familiar. This vocabulary can facilitate a more complete understanding of why some landowners accept and others oppose an environmentally hazardous project.

Meaning-making through anchoring and objectification

This study is an investigation of the process by which landowners interpret and evaluate a natural gas pipeline. It is a process that may generate insights into factors that influence either their support, opposition, quiescence, or acquiescence to this specific project. Those insights may more generally shed light on how other impacted groups respond to hazardous environmental projects. Moscovici's theory of social representations provides an approach by which it is possible to represent the pipeline as a novel event subject to different interpretations and evaluations by landowners based on individual and group differences in values, beliefs, and ideologies. At the core of their cultural knowledge is orderly hierarchical structures that differ by individual and group (Abric 1984: 180). When comprehended by such a structural approach, a 'cultural model' (D'Andrade 1981) of collectively shared images comprises knowledge that can be largely generated by a relatively small number of rules (Quinn 1982). Wagner and Hayes (2005:170), following an influential addition to Moscovici's work by Abric (1994), argue that a person's spontaneous production of an image or stereotype to describe a social object is related, but peripheral to, a less dynamic and more stable core area of a social representation.

Moscovici's (1984:29) approach to the ambiguity and uncertainty of a novel event, such as the pipeline project at the center of this study, is to render it comprehensible through two mechanisms or processes, "based on memory and foregone conclusions." "The first mechanism strives to *anchor* strange ideas, to reduce them to ordinary categories and images, to set them in a familiar context." Rateau and Moliner (2012:483) argue that anchoring is a social process: "The object will thus be interpreted in different ways depending on social groups." So, *I argue that*

groups may anchor the social representation of the pipeline, that is, reduce it to a familiar category or image, in different ways, depending on differences in their values, beliefs, and ideologies. Howarth (2006:696) says that this occurs simultaneously on the social and individual level. The novel object is linked to other items of knowledge held common among members of a community, so in a sense the social representation ‘re-presents’ an existing social object, “and so presents us with the possibility of agency, resistance and social change” (Howarth 2004: 4). Since the proposed research investigates landowners’ representations of ‘danger,’ it is relevant that Smith and Joffe (2013:18) argue that “anchoring classifies and names foreign and threatening phenomena in terms that resonate with those attempting to understand the phenomena.” Moscovici argued that a representation is *anchored* when the untethered object is classified and named (1984:35), “rather like anchoring a stray boat to one of the buoys in our social space” (1984:29-30). I prefer my own simile: an unrecognized species of duck might be anchored to the taxonomic category of ducks because it quacks in a characteristically common-sense ducklike way. So anchoring, to summarize its function in social representations theory, connects a previously ambiguous object to an existing social category in a population’s history or culture.

Moscovici (1984:29) then says, “The purpose of the second mechanism is to *objectify* them [novel events or objects], that is to turn something abstract into something almost concrete, to transfer what is in the mind to something existing in the physical world.” Moscovici indicates that the process is sequential: from anchoring to objectification. This is an order followed in some contemporary research (Evensen et. Al., 2014:67), but others (Rateau and Moliner 2012:483) reverse the sequence. Friere avoided the question of priority by arguing that “Consciousness is constituted in the dialectic of man’s *objectification* and *action* upon the

world” (1972:52). Jovchelovitch (2008a) similarly argued for the complex dialogical nature of all knowledge systems. The strength of that argument leads me to suspect that meaning-making through anchoring and objectification is iterative and ongoing, but I have not yet seen this claim argued, or evidence provided in the literature. Objectification defines an object or event through communication that selectively simplifies its characteristics, by reference to shared images, concepts, or symbols.

All novel events are inherently ambiguous. They can be disambiguated through this process, yielding a social response (Bugden et.al. 2017). The process gives meaning to the novel event as people interpret and evaluate it in terms of their everyday understanding of similar events in the past (Smith and Joffe 2013:28). To the extent that people share a common understanding of past events, they may also form a common understanding and response to a novel social object. As Joffe (2003:63) argues, the point is not to determine whether one response is correct, and another is not. So, as we have seen, if a biologist comes across a new species of animal, that animal would first be anchored to others that are taxonomically similar, and then objectified by giving the novel animal a concrete name. But if a hunter encounters that same animal, it may first be anchored within either the category of edible or inedible, and then made concrete by a name that is only shared with other hunters. The common-sense making of meaning, since it considers attitudes, values, and beliefs, may not necessarily square with probabilistic scientific thinking (Joffe 2003:68; Jovchelovitch 2008:437). Joffe’s argument is consistent with the common-sense characterization of risk as a social construction, reviewed in a following section. That characterization is a response to Malin’s (2014) call for a more inclusive and reflexive conceptualization of environmental justice.

For Moscovici, “the emergence of a social representation always coincides with the emergence of an unprecedented situation, unknown phenomenon, or unusual event” (in Rateau and Moliner 2012: 482). Stakeholders consider differing values, beliefs, and ideologies as they reconcile the complexity of the novel event, which may or may not motivate a response, depending on the stakeholder’s interests. The unambiguous naming and classification of a novel social object enables communication that is *shared* among members of a community (Rateau and Moliner 2012:478). This production of a socially communicable object is a major function of a social representation (Howarth 2006:696).

Devine-Wright (2009) was among the first to explicitly invoke the centrality of social processes during episodes of environmental disruption. During a gradual change, he theorized a process in which individuals and groups “become aware of, interpret and respond to potential change” (2009: 429). He then expanded that model of awareness, interpretation, and response into a well-known model, shown here as Figure 2:

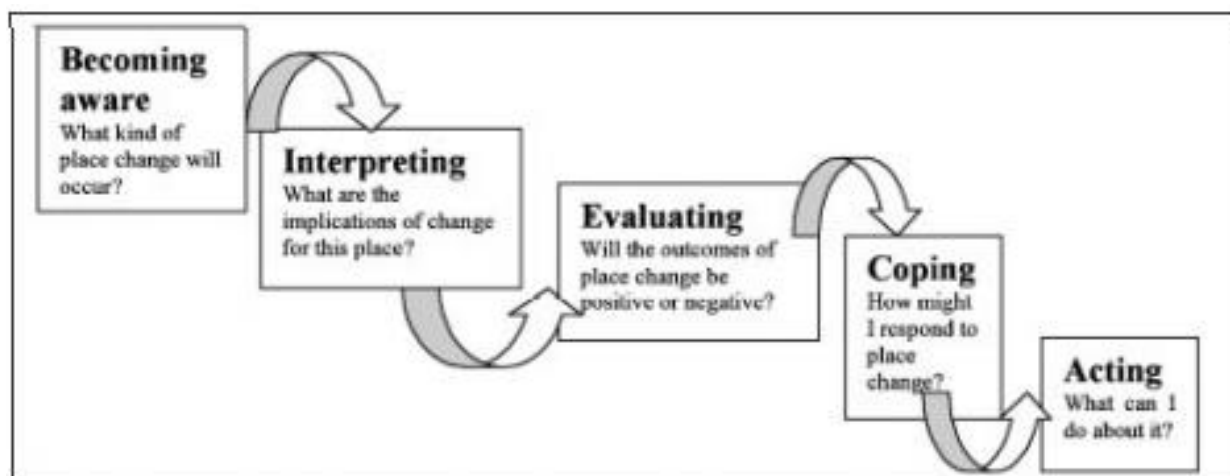


Figure 2: Devine-Wright’s (2009) Stages of Psychological Response to Place Change.

Bergquist et.al. (2020) adapted the Devine-Wright model in a recent study that interpreted and evaluated the local economic impacts of two large-scale infrastructure projects. Both studies use Moscovici's (2000) concepts of anchoring and objectification to explain how a novel event is made familiar. *People progress from interpretation to the evaluation of a new and complex phenomenon through a two-part process that is sometimes direct and sometimes iterative: by first anchoring it: naming or comparing it in terms of previous experiences, and then objectifying it: transforming the phenomenon into a social object through the attribution of shared images, concepts, and symbols.* I suspect from anecdotal evidence that pipeline fighters anchor the pipeline project by associating it with similarly perceived bad actors such as the fracking, coal, timber, and other natural resource extracting industries, and then objectify it by imagining it as a specific corporate plunderer. Evensen (2014:70) suggests that the assignment of (positive, negative, or neutral) valence is an important part of this process.

Bugden et al. (2017:2.1) clarify earlier descriptions of anchoring, a process “where novel experiences are construed in part through their associations with memories of past experience.” (See also Moscovici 1981; Moscovici and Duveen 2000; Wagner and Hayes 2005). For something to be interpretable, it must be intelligible in light of what an individual or community already knows and believes (Newell 1994).” Bergquist and associates (2017:3) similarly argue that anchoring serves an interpretive function. Moscovici argued that a representation is anchored when the untethered object is classified and named (1984:35), again, “rather like anchoring a stray boat to one of the buoys in our social space” (1984:29-30). So anchoring, to summarize its function in social representations theory, connects a previously ambiguous object to an existing social category in a population's history or culture. Objectification, then ascribes a concrete reality to

that abstraction. Categorical or social group differences in the social representation of the novel object may suggest how a specific group or social category responds to the object or event.

Cognitive polyphasia and its connection to ambiguous social identities

Martinez (2018) recently elaborated on the difference between cognitive dissonance: the well-known tension experienced when an individual is faced with contradictory cognitions (Festinger 1957) and cognitive polyphasia: Moscovici's (1961) term that conveys the proposition that the social self has multiple identities that coexist despite the potential for contradiction. Jovchelovich (2007a:69) defines cognitive polyphasia as "a state in which different kinds of knowledge, possessing different rationalities, live side by side in the same individual or collective." Gervais (1997:52-53) suggests that cognitive polyphasia exists "to *apprehend* complex and multi-faceted realities, and to *create* ambiguous realities as well." This approach may be particularly instructive in the theorization of quiescence and acquiescence, as researchers formulate the interpretation of property owners' ambiguous responses to an environmentally contentious infrastructure project.

My research is partly motivated by a recognition that a more inclusive and reflexive conceptualization of environmental justice supports the premise that individuals and groups faced with a novel environmental challenge may have complex, overlapping, and often contradictory identities. These ambiguous identities may come into play for property owners whose sense of danger and disruption to their sense of place lead them to consider the pipeline project as a threat or opportunity or both, which may then lead to their overall support for or opposition to the pipeline project. The concept of cognitive polyphasia is therefore a valuable concept in the theoretical toolkit of this research, since it expresses that a multiplicity of differing

and sometimes conflicting meanings can co-exist within individuals, groups, or communities (Mishra 2015).

Moscovici, with his background in psychoanalysis, recognized that the rational individual has the capacity to simultaneously hold contradictory cognitions. The social psychologist Festinger, by contrast, argued that individuals are motivated to reduce the discomfort of cognitive dissonance, particularly recognizable in the Western preference for non-contradiction (Jovchelovitch and Priego-Hernandez 2015). Snyder (1987) also notes that within any population there are individuals who have a greater or lesser propensity to self-monitor for consistency in the appearance of their social self. Mouro and Castro (2012), following Jovchelovitch (2007a), suggest the use of interviews to examine the complex communication and discourse of cognitive polyphasia. This suggestion is similar to Joffe's (2003: 68) conclusion that the public response to risk "is not only complex but often contains contradictory elements, which are difficult to discern by way of scales and survey items."

Batel and Devine-Wright (2015) explored the relationship between cognitive polyphasia and opposition to renewable energy technologies by arguing, again following Jovchelovitch (2007a), that individuals, groups, and societies may simultaneously harbor contradictory or competing cognitions. The ideas held at one level may then differ from the practices held at another level. Castro and Batel (2008: 493-494) argue that the coordination of these competing notions is a daily achievement, elaborated through concrete dialogic interaction. Cognitive polyphasia "allows individuals to position themselves both as responsible citizens, and as local residents defending the recognition of local knowledge and local interests (Mouro and Castro 2012:316-317). Batel and Devine-Wright (2015:12) argue that social representations are multi-dimensional; they may generate common agreement and simultaneously generate disagreement

“when it is materialized in proximal/everyday contexts and relations, where other relevant identities and representations are at stake and add new meanings to it.” Mishra (2105: 78) suggests that “cognitive polyphasia is a state of being caught between different modes of knowing.” This would seem similar to ‘double consciousness’ in post-colonial terms, allowing the “co-existence of multiple realities” (Mishra 20115: 85). Batel and Devine-Wright (2015: 14) suggest the need for more research into the co-existence of differing meanings regarding renewable energy technologies such as wind power. This proposed research extends that call to the exploration of the co-existence of different meanings regarding non-renewable energy technologies like natural gas.

Whereas the conflicting mental representations of individuals are experienced by individuals as cognitive dissonance, cognitive polyphasia is experienced as an intersubjective reality experienced between individuals. This social reality reflects the multidimensionality of the social self (Martinez 2018: 5). Martinez (2018:14) also says that “Cognitive polyphasia is often found at the meeting of cultural fronts.” So, for example, a person who identifies as a coal miner might also identify as a hunter or environmentalist. Similarly, in a traditional society a person may use folk medicine, voodoo, and modern medicine without feeling a sense of conflict. Moscovici ([1961] 2008) wrote that people’s social and individual identities largely determine how social objects are organized. Identities exist at different scales that are each represented by different kinds of knowledge (Provencher 2011). However, not all kinds of knowledge have equal value or legitimacy in society (Batel and Castro 2009). Howarth (2006) says that the legitimation that a particular kind of knowledge lends to a social representation may be related to a specific identity. The conceptualization of cognitive polyphasia is a recognition that an individual’s common-sense understanding of these multiple knowledges has the stress-relieving

consequence that “individuals are not forced to confront the inconsistency of their thinking (Martinez 2018: 6), perhaps because the legitimization of each social representation is specific to just one of multiple social identities. Batel and Devine-Wright (2015: 17) emphasize the importance of connecting different meanings to specific identities. So, in this research it is important to connect different meanings of ‘danger’ or ‘disruption to sense of place’ to specific identities. This will facilitate a more complete understanding of how different social groups exposed to the pipeline evaluate their potential for harm and may influence their response in the form of how they adapt to the pipeline project.

Key theoretical insights from the literature

It is evident from recent case studies that Moscovici’s theory of social representations has been productively applied to the process by which individuals and groups use pre-existing values, images, and ideologies to construct social responses to novel environmental events. It is also evident that researchers’ investigations of the risk associated with environmentally harmful infrastructure projects have prioritized sites of *production*, such as fracking and mining, but the potential harm of utility-scale *transmission* projects, such as pipelines, demands more scholarly attention. The lack of insight has important environmental justice and public policy implications. A conservative lobbying association (Business Roundtable 2017) stated that as of 2017 there was approximately 1,083,000 miles of energy transmission (electricity, natural gas and petroleum) lines just in the United States, so the impact of utility-scale transmission projects on human populations and the natural environment should not be ignored.

Within the narrower scope of the perceived risk associated with utility-scale transmission, there is scarce attention to the *micro-scale representation of harm* to individuals and local groups. There are evidently no studies to date that focus exclusively on the *danger and*

disruption to landowners' sense of place associated with utility transmission projects, and none that use social representations theory to gain insight into the process by which landowners use prior knowledge to interpret and evaluate such a novel event. This insight is essential for a comprehensive understanding of how impacted individuals and groups choose support, opposition, acquiescence, quiescence, or indifference to environmental threat.

This research will use the theory of social representations in response to a recent call for a more thorough understanding of what Malin (2014) terms 'sites of acceptance'. These sites are often fairly characterized as having acquiesced to neoliberal norms and/or local socioeconomic contingencies. A comprehensive understanding of the potentials for harm perceived by exposed individuals and communities requires an understanding of risk, extending well beyond earlier perspectives that were reductively rationalistic and probabilistic. Theorists now consider risk to be a social problem, a key concept that is particularly relevant to modernity, and a central theme in the social sciences. The problem of risk is particularly important for environmental hazard/disaster theorists and those concerned with public health and safety policy in a world dominated by corporate powerholders. Social representations theory provides a structure for investigating the process by which landowners arrive at alternative assessments of their risk and alternative responses to the pipeline project. The theory is used in this case study to provide a structure for investigating differences among groups of landowners regarding their assessment of vulnerability and resilience to two forms of potential harm: danger and disruption to their sense of place. Landowners' interpretation and evaluation of the novel risk is then available as a common-sense product that justifies either support, opposition, acquiescence, quiescence, or indifference to the project.

The harm associated with natural, anthropogenic, or natech environmental hazards/disasters often includes danger and disruption to a population's sense of place. Environmental sociologists emphasize that within populations there may be significant differences in vulnerabilities to such potentials for harm. Kaspersen et al. (2001:251-252) explain these differences by arguing for a causal chain that links vulnerability to risk. The present research follows Brooks' (2004) distinction between social and biophysical vulnerability. Environmental danger, which is primarily a biophysical vulnerability, has a low probability of occurrence, but a high consequence when it does occur. Disruption to sense of place, by contrast, is a high-probability, low consequence social vulnerability. The focus on disruption to sense of place in this research is an expansion of Snow and Soule's (2010:37) categories of disrupting events, which include "intrusions into or violations of culturally defined areas of privacy and control, such as community space, by strangers or outsiders" particularly with disruption of landowners' identification with, attachment to, and dependence on places where they live. A local group's social representations of a novel environmental threat, influenced by their physical and social location, is available as a resource for contending groups, including activists challenging the imposition of hazards on natural and human environments.

III. Methods

This research is a systematic inquiry into how people experience and react to a novel event: a natural gas transmission pipeline project. Prior research revealed that variation in public reaction to hazardous energy production projects, such as coal or uranium mines or fracking sites, may be related to economic or political ideological factors, and may also be influenced by physical distance from the hazardous object. The first aim of this mixed method design was to determine the extent to which those factors that apply to energy *production* projects also apply to a utility-scale energy *transmission* project. The resolution of that first aim drew on quantitative data from the Quality of Life in Rural Virginia and West Virginia Survey (Bell et al. 2019), which included a number of questions to gauge the community and individual impacts of the Mountain Valley Pipeline. The object of this specific case study was particularly contentious, with its implications for environmental justice. My aim was to recognize and represent the entire range of reactions to the pipeline, from those who accept or support the project to those who oppose it. Therefore I framed the first aim of this study in the positivist paradigm, a value-free tradition guided by principles of objectivity, knowability, and deductive logic.

The Quality of Life in Rural Virginia and West Virginia Survey included 92 questions. Six of those questions were followed by space for additional comments. Responses often indicated that they had much more to say than could be captured within the spatial and temporal parameters of the questionnaire. The second aim of this research was to explore the utility of social representation theory, the goal being a more robust understanding of landowner response. The range of comments in the survey justified follow-up with in-depth interviews of people living in the path of the pipeline. As anticipated, landowners' truth varied, so the second aim of this research was framed not in the positivist paradigm but within that of social constructionism,

developed by Berger and Luckmann (1966). This tradition recognizes that there are multiple realities in a continuous state of social negotiation. The fulfillment of the aims of this research therefore justified a design capable of integrating both the objective, quantitative data of the survey and subjective, qualitative data from landowner interviews.

Theoretical and practical considerations guided the design of this research. The design approximates Tashakkori and Teddlie's (1998) Type VI mixed method design, in which the exploration of quantitative data is followed by qualitative analysis and inference. It is therefore a quantitative→qualitative sequential design. It also follows the triangulation strategy characterized by Plano Clark et al. (2006:62) by validating and expanding, or estimating the error (Kadushin et al. 2008:47) of quantitative statistical results through comparison and contrast with qualitative data. These two independent sources of data ensure the construct and content validity of the study. The overall aim of the research was to explore the value of social representation theory as a way to understand the process by which people become aware of, interpret, evaluate, and then respond to the MVP project, following Creswell and Plano Clark's (2018:84-91) exploratory sequential design. The study was consistent with the grounded theory approach in the sense that it suggested that landowners' realities are grounded in the factors that impact their experiences with the pipeline project. Neither the more quantitative strengths of the Quality of Life in Rural Virginia and West Virginia Survey nor the qualitative strengths of the interviews alone fully capture the range of landowners' response to the pipeline. I considered each as a legitimate tool in the practical search for new knowledge, following Bourdieu's (2004) argument for the value of combining statistical analyses with direct observation.

The survey and interviews were performed sequentially rather than concurrently, analyzed separately, and then merged for final analysis (Creswell and Creswell 2018; Creswell

and Plano Clark 2018). For purposes of corroboration and validation, the study incorporated triangulation by comparing quantitative and qualitative results. Survey data were gathered in the spring and fall of 2019, and interviews were conducted from fall 2021 to spring 2022. The original institutional review board (IRB) did not allow face-to-face interviews, due to COVID-19 policy. That restriction was lifted by amendment when it was considered safe. Subsequently 20 interviews were conducted in person, and 5 were conducted over the phone. My background in anthropology sensitized me to the value of face-to-face interviews, particularly when eliciting data-rich descriptions of property owners' sense of place and perceptions of danger in such close proximity to the pipeline.

Chapter III makes explicit the aims and objectives of this exploratory mixed-methods case study. It then details the research design, specifying the procedure for how data were collected. It characterizes the documents used for the survey and interviews, and then describes their preparation and analysis. The chapter then identifies and operationalizes key variables for the analysis of data from the Quality of Life in Rural Virginia and West Virginia Survey, and introduces the sampling procedure for both the survey and interviews. The chapter concludes by addressing the strategies used to confirm the reliability and validity of the survey instrument and interview procedure, and also the strategies that ensured the protection of human subjects.

A. Research aims and objectives

First aim: Explore the influence of three factors: economic self-interest, political ideology, and geographic distance, on residents' attitudes toward the pipeline project

This aim is intended to explore whether three factors that have been associated with attitudes toward contentious sites of energy production apply in the case of this site of energy transmission. Prior research suggests that public attitudes toward energy infrastructure

production projects are influenced by three important factors: perceived economic self-interest, internalized neoliberal logics, and physical or geographic distance from the production site. The first aim of this research was to use both survey and interview data to explore the extent to which these influences also apply in the case of the Mountain Valley Pipeline, as a site of transmission rather than production. Specific objectives, each associated with one of these three factors, therefore structure the *first aim*. I explored the first two of these three specific objectives by using survey data to test whether or not there is a statistically significant difference in attitude toward the pipeline associated with factors that indicate property owners' economic self-interest or political identity. I explored the third factor, physical or geographical distance from the pipeline, by using survey data to test whether or not there is a statistically significant difference in attitude toward the pipeline project associated with whether the property is owned in the blast zone or in the control zone, which is at least 10 miles from the pipeline, although in the same county.

I used quantitative data from the Quality of Life in Rural Virginia and West Virginia Survey to test null hypotheses that support for the pipeline project has no statistically significant relationship with property owners' economic or sociopolitical attitudes. A finding of no significant relationship would support the argument that attitude toward this transmission site, unlike sites of production, is not affected by perceived economic self-interest or political ideological attitudes. I then present qualitative data and insights from the interviews to amplify these quantitative results, in the tradition of data triangulation pioneered by Denzin (1978) and advanced by Creswell (2007).

Physical or geographic distance is the third factor claimed in previous research to be an influence on attitude toward an energy infrastructure project. I again used survey data to test the

null hypothesis that there is no statistically significant relationship between attitude toward the pipeline among those living in the blast zone and those living at least 10 miles from the pipeline, but in the same county. Again, the results of this analysis are discussed through insights from the interviews, all of which are from the blast zone, since if there is any difference, it is likely due to factors associated with proximity to the pipeline.

Second aim: Explore a fourth factor: how the social representation process influences residents' attitudes toward the pipeline as a novel social object

The second aim was to use data, primarily from interviews and secondarily from the survey, to explore the extent to which landowners' expressions of support or opposition are subsequent to a process whereby landowners and their neighbors become *aware of, interpret, evaluate, and act upon* what is, in their experience, a novel environmental hazard. More specifically, my objective in attaining this second aim was to use Moscovici's social representation theory to advance a nuanced understanding of the way property owners use their prior understandings of similar phenomena to interpret, evaluate, and then help decide how to respond to the Mountain Valley Pipeline. This approach provides another way, beyond economic self-interest, political ideological tendencies, or geographic distance, to account for variation in landowner response to an environmental harm.

Recent research (Bell et al. 2022) on landowner response to the MVP suggests that when respondents report negative impacts from the pipeline, while neighbors express support, their opposition is likely to be suppressed, demonstrating the importance of social networks for predicting quiescence and resistance. Expressions such as these, of support or opposition, do not come out of thin air. These expressions of support or opposition, aside from economic self-interest, political ideology, and/or proximity to the pipeline, may be subsequent to a process

whereby landowners and their neighbors become aware of, interpret, and evaluate what is, in their experience, a novel environmental hazard. This is consistent with Zaller's (1992) observation that people often take their cues from local elites.

I interviewed 25 owners of property in the blast zone of the MVP, reaching the point of theoretical saturation. That point was based on the declining number of codes added as the number of interviews approached 25, as documented in Figure 4. The interview protocol was designed to better understand the process leading to landowners' decision whether to oppose, passively resist through quiescence, passively accept through acquiescence, support, or remain indifferent toward that hazard. As a transition between the first and second aims of this research I used data from the Quality of Life in Rural Virginia and West Virginia Survey to better understand the demographic similarities and differences between survey respondents in blast zone and those in the control zone. The quantitative rigor of the survey findings combined with the qualitative insights of the interviews (Kitchin and Tate 2000) for a more complete understanding of property owners' attitudes toward the pipeline project.

B. Research design

Design for the first aim: the extension of prior research into a new direction

My strategy for achieving the first aim of this research was to design and conduct a study that explores the extent to which perceived economic self-interest, internalized neoliberal logics, and concern for spatial distance found in sites of *production*, such as fracking communities and certain mining and milling operations, associate with attitudes toward this pipeline, as a site of *transmission*. That exploration would either validate or challenge the literature in a direction that is unexplored and important to environmental justice communities, because previous research has conflated factors that may not apply to the Mountain Valley Pipeline, as an energy

transmission project. The procedure involved the collection, preparation, and analysis of data from the Community Impacts of the MVP survey.

A research team that included the principal investigator, Dr. Shannon Bell, and research assistants, including myself, used a Microsoft Excel spreadsheet to enter and verify the accuracy of raw data from the surveys. Following data preparation, the present research used the statistical capabilities of Excel, loaded with the optional Analysis ToolPak, to perform data analysis.

The following discussion outlines the specific objectives for achieving the first aim of this research.

Specific Objective #1: *To test whether pipeline project attitudes are associated with economic self-interest:* There is recent research involving other energy infrastructure projects suggesting that when members of a community *support* a project, they may do so out of economic self-interest. Does a property owner having received an economic benefit, or at least having the assumption of a benefit (in the form of payment for an easement or sale of property) associate with reported changes in quality of life due to the MVP, as a proxy for attitude toward the project? Data from the survey allows an investigation of the association between *economic benefit* and *attitude toward the project* with a finer level of detail than has been possible with community or regional studies, because the test sample includes only landowners who either received or anticipated the receipt of an easement payment.

Hypothesis #1: The null hypothesis (H_{10}) is that there is no statistically significant association between economic benefit and attitude toward the project. The alternative hypothesis (H_{1a}) indicates a statistically significant relationship between the variables.

Independent Variable = Survey question Q26c: “Have you signed an easement with the pipeline company?” An answer of “1” to question 26c indicates a “Yes” response to the question. An answer of “0” indicates a “No” response. An answer of “.” Indicates that the pipeline is not being constructed on the landowner’s property, although at least part of the property may be in the blast zone. This measure is a proxy for economic benefit, which was not possible for blast zone property owners whose property was not crossed by the pipeline. Therefore the test included only property owners for which an economic benefit was possible.

Dependent Variable = Survey question Q31: “Do you feel that the MVP has affected your quality of life? An answer of “1” indicates a negative effect. An answer of “2” indicates a positive effect. An answer of “3” indicates no effect on the respondent’s quality of life.

It is necessary to use a nonparametric statistical test with these two categorical variables. Pearson’s χ^2 test for independence (or simply chi square) is an appropriate and useful test, followed by a strength statistic, such as Cramér’s V. Chi square assumes the two categories of variables are mutually exclusive (independent), but may violate the assumption of equal variance (homoscedasticity), and it uses counts rather than frequencies.

Specific Objective #2: *To test whether pipeline project attitudes are associated with internalized neoliberal logics:* Recent research suggests that people who hold a conservative political ideology tend to have libertarian and neoliberal views that support minimally regulated industrial development such as energy infrastructure projects. The research so far mostly investigates sites of production rather than sites of transmission. A test of data from the Quality of Life in Rural Virginia and West Virginia Survey, as a site of transmission, may either validate

or challenge connections between any form of political ideology and opposition to energy infrastructure projects.

Hypothesis #2: The null hypothesis (H_{20}) is that there is no statistically significant association between political ideology and attitude toward the pipeline project. H_{2a} is the alternative. In this case, null being rejected, there may be an association between political ideology and attitude toward the pipeline.

Independent Variable = Survey question Q90: “How would you identify yourself on the political spectrum?” Note that Wood and Vedlitz (2007: 564) use a similar measure of what they label “ideology” with an 8-point scale equivalent to Q90. The original 1-8 Likert scale is collapsed into 3 responses: liberal, moderate, and conservative.

Dependent Variable = Survey question Q31: “Do you feel that the MVP has affected your quality of life? An answer of “1” indicates a negative effect. An answer of “2” indicates a positive effect. An answer of “3” indicates no effect on the respondent’s quality of life.

Chi square is used as a test of association, followed by the strength statistic, Cramér’s V.

Specific Objective #3: To test the influence of spatial distance on attitude toward the pipeline project: Recent research reveals an inconclusive relationship between geographic distance from a hazardous infrastructure project and support or opposition to that project. This is captured by NIMBY vs. inverse-NIMBY arguments. The ArcGIS data used for differentiating between blast zone properties and other properties further away from the pipeline affords an unusually close-scale opportunity for assessing the relationship between geographic or spatial distance and attitude toward such a project. Note that since a pipeline is a linear environmental hazard, its larger area can yield more cases (here, about 430 in blast zone, 353 outside blast zone)

than a typical point-source environmental hazard, such as a mine, mill, powerhouse, hazardous waste processing or disposal site.

Hypothesis #3: The null hypothesis (H_{30}) is that there is no statistically significant association between physical/geographic distance from the pipeline and attitude toward the project. If the null hypothesis is supported, it suggests that property owners are not influenced by physical/geographic distance from the pipeline. If the null hypothesis is not supported, (H_{3a}) it suggests that property owners are influenced by physical/geographic distance from the pipeline. The null hypothesis would provide support for arguments such as Malin's (2014) "Yes to the Mill." The alternative (non-null) hypothesis would provide support for other studies (such as NIMBY arguments) that find an association between proximity to a hazardous project and attitude toward the project.

Independent Variable = Survey question IDCode: ArcGIS data determined whether any part of a landowner's property is in the blast zone. The first letter of the IDCode is either a B (blast zone) or C (control zone), which is at least 10 miles from the blast zone but in the same county. Property in the blast zone is coded as a one (1)); Property in the control zone is coded as a zero (0).

Dependent Variable = Survey question Q31: "Do you feel that the MVP has affected your quality of life? An answer of "1" indicates a negative effect. An answer of "2" indicates a positive effect. An answer of "3" indicates no effect on the respondent's quality of life. I suggest that this variable may also be interpreted as an indicator of disruption to quality of life.

A chi-square test is used to determine whether these two categorical variables are independent of each other. A chi-square calculated value that is greater or lesser than the chi-square critical value indicates whether the null hypothesis is accepted or rejected. Cramér's V is used as a strength statistic following the chi-square test to measure how strongly the two categorical fields are associated.

Second aim: To add the social representation of danger and disruption to other factors that influence property owners' attitudes

My strategy for achieving the second aim of this research was to explore the importance of earlier life experiences in determining property owners' awareness, interpretation, and evaluation of the pipeline project, as an additional way of predicting property owners' attitude toward the project. The exploratory nature of this aim is intrinsically qualitative, requiring in-depth, semi-structured, open-ended interviewing, and reflexivity on my part as an interviewer. I appreciate and acknowledge my collaboration with property owners who generously demonstrated their authority and authenticity.

This second aim, operationalized as my fourth specific objective, is at the heart of this project. I argued that economic, ideological, and distance-related factors do not completely account for differences in support or opposition to hazardous environmental projects. My objective in conducting interviews was to explore support for the argument that social representations of this pipeline project also contribute to an impacted population's support, opposition, quiescence, acquiescence, or indifference to the project. The pursuit of this objective in the interviews reiterated the general theoretical sequence of the social representation process, although there were times during the interviews when the flow of conversation did not allow that sequence.

This fourth objective has four steps, using a method suggested by social representation theory. I believe this is a unique application of this theory to such a semi-structured interview protocol. Step One questions how subjects became *aware* of the pipeline project. Step Two asks how they *interpret* the project, by comparison with their prior experiences, with special attention to two features salient to the blast zone: 1) physical danger and 2) disruption to prior attachment, identity, and dependence on their sense of place. Step Three probes their *evaluation* of and *response* to the project. It results in a valenced definition of this previously neutral or ambiguous social object. It also asks if there are socially significant others who have influenced that evaluation, probing deeper into the prior work by Bell et al (2022) that argued for the importance of social networks in predicting response to the MVP. Finally, it probes the strength of their response of either support, opposition, quiescence, acquiescence, or indifference to the project. A more complete understanding of the awareness, interpretation, evaluation, and response of specific social categories in an exposed population may allow environmental justice advocates, government policymakers, and the public itself to more fully anticipate the human social impact of an environmentally contentious development project.

C. Key variables

Key variables from the survey:

Attitude toward the project: Q31: “Do you feel that the MVP has affected your quality of life? An answer of “1” indicates a negative effect. An answer of “2” indicates a positive effect. An answer of “3” indicates no effect on the respondent’s quality of life. This variable can also be interpreted as a proxy for disruption to landowners’ quality of life.

Economic benefit: Q26c: “Have you signed an easement with the pipeline company?” A response of “1” for question Q26c indicates a “Yes” answer to the question. An answer of “0”

indicates a “No” response. An answer of “.” indicates that the pipeline is not being constructed on the landowner’s property, although at least part of the property may be in the blast zone. This measure is a proxy for economic benefit, which was not possible for blast zone property owners whose property was not crossed by the pipeline. Therefore only property owners for whom an economic benefit was possible were included in this variable.

Political ideology: Q90: “How would you identify yourself on the political spectrum? Answers #1-3 are proxies for a liberal political ideology. Answer #4 indicates identification as moderate/middle of the road. Answers #5-8 are proxies for a conservative political ideology. The original 1-8 Likert scale is collapsed into 3 responses: liberal (1-3), moderate (4), and conservative(5-7).

Geographic proximity to the pipeline project: Survey ID Code: ArcGIS data determined whether any part of a landowner’s property is in the blast zone. The first letter of the IDCode is either a B (blast zone) or C (control zone), which is at least 10 miles from the blast zone but in the same county. It is therefore a bivariate measure. Q24: “Is any land you own, rent, or live on located in the ‘blast zone’ of the MVP?” is a subjective measure of geographic distance from the pipeline. This research uses the objective measure taken from the ArcGIS data and coded into the survey ID code. A comparison between the survey ID Code and responses to Q24 revealed 7 cases in which ArcGIS data determined that a property is in the control zone, but the survey respondent indicated their property is in the blast zone. That comparison also revealed 83 cases in which ArcGIS data determined that a property is in the blast zone, but the survey respondent indicated that their property is not in the blast zone. The reason for this discrepancy in perception is unclear, but is likely related to the fact that residents living in the blast zone are not notified of their proximity to the pipeline. The only residents that are notified (by the pipeline company) are

those who have property in the construction zone (i.e. the pipeline company intends to build through their land). This research will use the ArcGIS data, since it is the more objective indicator of geographic proximity to the pipeline.

Key codes and categories/themes from the interviews:

The key codes and categories that emerged from the interviews were primarily intended to inform the second aim of this study, and secondarily intended to qualify the results of the first aim of the study. The interview protocol, designed to explore the second aim of the study, prompted responses in a sequence that roughly parallels the process by which landowners experienced and then reacted to the pipeline project. Codes emerged when a response matched a single idea that represented part of that sequence. The codes and categories generated by the interviews are documented in Appendix B. The transcription and organization of data from the interviews is described below under Interview Procedure.

D. Survey sample and interview sample

Survey sample:

Drs. Shannon Bell, Mike Hughes, and Korine Kolivras designed the Quality of Life in Rural Virginia and West Virginia Survey as part of a project examining the quality-of-life effects of the Mountain Valley Pipeline. The survey sample included residents living in the Virginia counties of Montgomery, Giles, Craig, Franklin, Roanoke, and Pittsylvania and the West Virginia counties of Monroe, Greenbrier, Summers, and Fayette. Bell and colleagues (2022) described the survey sample in further detail. The Mountain Valley Pipeline project runs through the largely rural, mountainous terrain of these counties. The 2019 total population estimate for the Virginia counties is 330,968, and 102,916 for the West Virginia counties, according to the U.S. Census Bureau.

The research team used a Geographic Information System database of land parcels and associated property owners' mailing addresses through access to publicly available county property records. A description of survey methods are described in a recent article (Bell et al. 2022).

The research team eliminated corporate landholders, federal and state-owned property, property owned by the pipeline developer, and consolidated multiple properties owned by the same landowner, leaving 2,654 addresses in the six Virginia and four West Virginia counties. The sampling frame of the study population requests the response of one person per address (the 'resident') among all of the people identified by land parcel addresses within that GIS database, subdivided into two groups: one within the blast zone (the 1,115-foot wide Potential-Impact Radius of the MVP), and another group with addresses at least 10 miles from the pipeline route in these same counties. The sampling frame excludes people who are under the age of 18, prisoners, or adults not capable of consent on their own behalf.

Interview sample:

Sixty-seven survey respondents whose property is at least partly in the blast zone indicated a willingness to be interviewed, by returning a postcard enclosed with the survey. Half of the interviews were originally planned to be respondents who indicated either active or passive non-support for the pipeline project, and half were planned to be respondents who support the project, which is to say they either support, acquiesce, or are indifferent to the project. However, recruitment by telephone and email resulted in 25 interview participants ($N=25$) who were subdivided by the sampling characteristic of "support the pipeline project" ($n=17$) and "oppose the pipeline project" ($n=8$). The interview sampling criteria is shown in Figure 3.

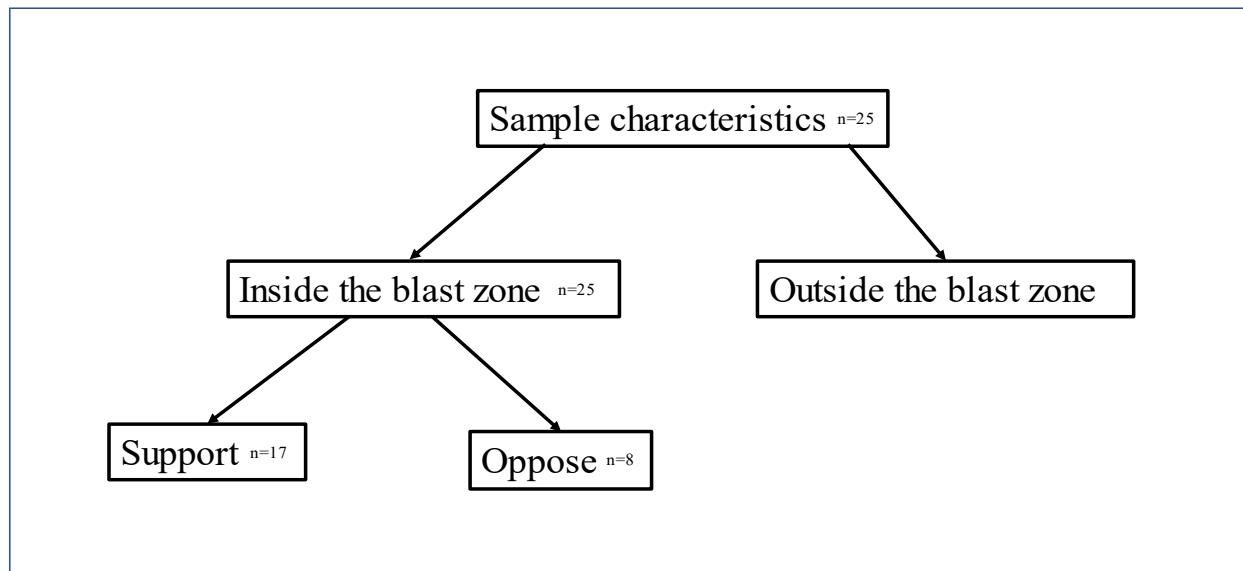


Figure 3: Interview Sampling Criteria

The number of interviews reflects the need to achieve a saturation point within the categories of support, opposition, quiescence, and acquiescence, so there is sufficient variation to make meaningful comparisons (See also Figure 4).

E. Data collection and documents

Survey instrument

The survey instrument was described above under Survey Sample. The survey's designers generously added questionnaire items critical for the present research. New River Geographics worked with the researchers to generate a database of land parcels and associated property owners' mailing addresses through access to publicly available county property records.

The Principal Investigator for this project, Dr. Shannon Bell, sent a pre-survey letter informing potential subjects about the project, followed by the Community Impacts of the Mountain Valley Pipeline survey, a 92-item structured questionnaire, mailed about two weeks

later. The pre-survey letter and the survey were sent to all of the addresses of potential subjects in the blast zone, and a random sample of addresses of potential subjects outside the blast zone but within the same counties. The survey queried residents of counties in the path of the pipeline regarding the quality of their lives, their mental health, and the effects of living near the pipeline. A reminder postcard was sent three weeks later to those who had not completed the survey, and then a second survey to non-responders three weeks after the reminder postcard. A postcard asking respondents whether they would be interested in being interviewed was included in the first survey mailing.

Interview procedure

The process for the collection and analysis of the qualitative data was as follows. I conducted and recorded interviews either face-to-face or by telephone. The interviews were between 50 minutes and 2 hours in length. I recorded the interviews with two devices: a Sony IC digital recorder, and Rev Recorder, a phone voice recorder app. Recording devices are capable of recording at least 3 hours of conversation. I used Rev.com, a transcription service on CobbleStone, Virginia Tech's list of approved transcription services, to electronically transcribe the recorded interviews. I elicited no names or other identifiers in the audio recordings in order to protect the confidentiality of respondents. I suppressed any identifying information in the written transcripts if they were recorded in the interviews. I edited the electronically transcribed transcripts for clarity and accuracy, and simultaneously coded for key words and concepts, and also inserted comments, insights, and other notes. I followed the order of the interview protocol as much as possible, but often rearranged the order out of respect for the priorities of the participants. The interview protocol was designed to minimally elicit the themes suggested by the process of social representation: awareness of the novel event, followed by its interpretation,

evaluation, and response. I used no names or pseudonyms in the results and discussion, opting instead for a short reference to the person's occupation or prior occupation, which I considered more informative. I merged codes into meaningful categories that I discussed in the results and discussion of this study.

The interview questions were designed to probe for intra- and intercategory patterns (Huberman and Miles 2002) not fully developed by the survey: norms, values, connections to community, and identity with existing networks of neighbors and kinspeople that contribute to landowners' sense of the danger and loss or disruption to their sense of attachment and identity with their place. I then probed how property owners associate these factors with their response to the pipeline project. The interview questions were intended to allow codes and categories to emerge from the raw data itself.

The internal validity of this research was established on the basis of the credibility and rigor of the methods used to collect and analyze the data (Miles and Huberman 1994). The external validity of the research, to the extent that external validity is even applicable to case studies, depends not so much on the "typicality or representativeness of the case but upon the cogency of the theoretical reasoning." (Mitchell 1983:207). I used theory-informed insight to explain how danger and disruption influence the attitudes of property owners close to the pipeline. The patterns and categories that emerged from the interview data provided depth and nuance to the results of the first aim of the research design and suggest, per the second aim, the usefulness of social representation theory in organizing responses to the pipeline project as a novel environmental event.

I used the addition of new codes as interviews were analyzed to conclude that by the end of the 25th interview, the study had developed a valid and robust understanding of landowners' attitudes toward the pipeline project. On that basis I scheduled no additional interviews.

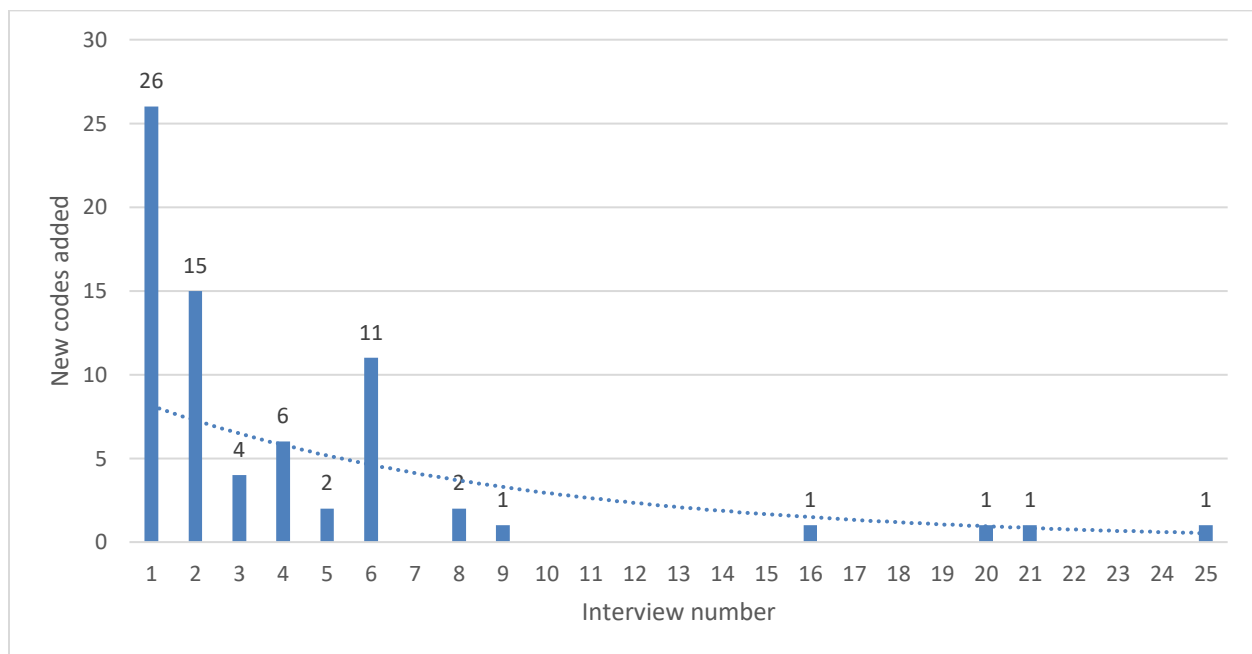


Figure 4. Demonstration of Data Saturation

Interview protocol

The interview protocol for this project (see Appendix A) was guided by questions aimed at exploring the process by which respondents living in the blast zone use their pre-existing knowledge to “make sense of a specific social object” (Provencher 2011:390) which in this case is the natural gas pipeline project. The interviews, as well as the transcriptions, coding, and analysis, revealed previously unrecognized factors that influence landowners’ attitudes and feelings. I limited my inquiry somewhat to two specific potential sources of harm that the survey indicated are particularly important for informing the representation of the pipeline in this rural Appalachian population: the *danger* that landowners may associate with physical proximity to

the pipeline, and the *disruption* to landowners' sense of place that they may associate with the project. I argued in the discussion for the usefulness of what I believe is a unique use of Moscovici's theory, in which the structure and sequence of open-ended questions during the interviews mirror the theoretical structure and sequence of the social representation process itself. The ordering of open-ended questions in the interview protocol was therefore intentionally sequential, following Bailey's (2007) guidelines for structured interviews. The interviews were conducted during the construction of the pipeline, when pre-existing attitudes toward danger and disruption to sense of place were top of mind for property owners as they constructed their representations of the pipeline.

A final comment on methods

This project was designed to both test recognized factors and disclose new factors that are associated with how landowners will react to the Mountain Valley Pipeline. Danger was one new factor relevant to owners of property in the blast zone. There was considerable variation in the interpretation of danger. For instance, a farmer's understanding of danger may be very different from the understanding of a person living in a suburban woodland neighborhood. People who farm learn how to stay safe while working around or repairing farm machinery. Some homeowners living in a wooded suburb of a college town may have equally profound but entirely different pre-existing categories of danger, perhaps concerned with the protection of their professional status. Similarly, rural-based hunters learn gun safety at an early age and know to wear hunter orange in the woods, so they have different attitudes toward danger that may carry over into their assessment of the danger associated with the pipeline project. But woodland homeowners who are not hunters may prioritize environmental danger at a less personal scale, such as harm to water, air, or the climate. The point is that the lived experience of a group can

shape how it represents and then reacts to a novel ambiguous object or event. An accurate, in-depth discernment of those lived experiences underscores the value of a mixed methods approach.

IV. Results and Findings

A compelling body of evidence suggests that local residents may support or resist a potentially harmful infrastructure project based on economic self-interest and/or their professed political ideology. In many cases, geographic proximity to a project can also influence attitudes toward such a project. Recent research suggests that the attitudes of neighbors can also influence a landowner's support, resistance, quiescence or acquiescence to a project (Bell et al. 2022). These are general factors that may apply across a variety of projects. The present research used quantitative survey data to achieve its *first aim*: to explore the extent to which these factors apply in the case of a natural gas pipeline, as a linear source of energy *transmission*, compared to more thoroughly studied point-source energy *production* projects such as fossil fuel or nuclear energy production and processing facilities. The *second aim* of this research was to go beyond these general factors to suggest a theoretically grounded process by which property owners use their pre-existing conceptions of danger and disruption to interpret, evaluate, and respond to the unique and specific characteristics of a potentially harmful project. This second aim required the gathering and analysis of data from semi-structured interviews with 25 owners of property in the blast zone, where the potential for harm was most evident. Interview data also provided insights into the interpretation of the quantitative results for the first aim of the research.

This chapter begins with a brief overview of the similarities and differences between the interview sample, the blast zone subsample and control zone subsample of the survey, and the general population along the route of the pipeline project. This both characterizes the study population and determines whether the survey and interview sample are representative of the general population. The chapter then presents other relevant findings from the study. In pursuit

of the first aim, quantitative data from the survey were used to test whether or not this energy transmission project provides support for previous studies that indicate a link between property owners' attitudes toward such projects and three factors: economic self-interest, political ideology, and geographic distance from the potential source of harm. In each case, the result was then triangulated with qualitative evidence from the interviews. In pursuit of the second aim, the study used qualitative data from the interviews to provide support for the argument that social representation theory is a useful structure for organizing themes that sequentially lead from property owners' initial awareness of the pipeline project to their ultimate response: whether to resist (actively oppose the pipeline), become quiescent (passively oppose), acquiesce (passively accept), accept (support the pipeline), or choose indifference toward the project.

A. Characterization of research participants

The study produced data that enabled a characterization of the interview and survey respondents, which could then be compared with county and state statistics to determine their representativeness relative to the general population. This brief section is focused on the following characteristics: population, race/ethnicity, age, gender, education, household income, and length of family tenure by county. Other sections include more detailed characterizations that are relevant to specific aims or objectives.

Table 1 documents the survey and interview sample count, by county and state, with a comparison to county total population. Craig County in Virginia is not well represented because of its low population and because the pipeline route goes through fewer than 10 properties. Fayette County in West Virginia is not well represented because the pipeline cuts across only a small part of the county.

Table 1. Survey and Interview Sample Count, by County, and Total 2020 Population

	Survey	Survey	Survey	Interview	2020
County	Blast	Control	Total	Cases	Population
Giles	66	27	93	3	16,787
Montgomery	41	47	88	3	99,721
Franklin	157	98	255	5	54,477
Craig	1	5	6	0	4,892
Roanoke	24	12	36	2	96,929
Pittsylvania	47	79	126	4	60,501
VA Subtotal	336	268	604	17	333,307
Monroe	39	42	81	5	12,376
Greenbrier	30	25	55	2	32,977
Summers	24	17	41	1	11,959
Fayette	1	1	2	0	40,488
WV Subtotal	94	85	179	8	97,800
TOTAL	430	353	783	25	431,107
County populations from U.S. Census Bureau 2020 QuickFacts on April 1, 2020.					

The 25 interview respondents, all of whom were owners of property at least partially in the blast zone, presented as racially white. 95.33% of survey respondents, from Virginia and West Virginia, identified as white. Table 2 shows self-reported racial/ethnic categories from the survey, with percentages of the total survey sample, as well as U.S. Census percentages for Virginia and West Virginia. The low survey percentage for Black or African Americans may reflect nationwide statistics. Black or African American comprise 7.8 % of the rural and 13.1 % of the urban population (USDA 2018). The low survey representation may also reflect the lower percentage of Black or African Americans in West Virginia. Note that although the survey total is only 21 for Black or African Americans, they comprise 4.00 % of respondents in the blast

zone, but only 1.44% in the control zone. A chi squared test found no significant difference between the observed and expected population distribution.

Table 2. Race/ethnicity of residents, comparing blast and control zones to total survey and state percentages.

		Blast	Blast	Control	Control	Survey	Survey	VA	WV
		zone	zone	zone	zone	Total	Total	Total	Total
		N	%	N	%	N	%	%	%
Asian or Pacific Islander		0	0.00%	0	0.00%	0	0.00%	7.00%	0.80%
Black or African American		16	4.00%	5	1.44%	21	2.72%	19.90%	3.60%
Hispanic or Latino/a		2	0.50%	1	0.28%	3	0.39%	9.80%	1.70%
Middle Eastern or N. African		0	0.00%	0	0.00%	0	0.00%	n/a	n/a
Native American or Aleut		0	0.00%	2	0.57%	2	0.26%	0.50%	0.30%
White		402	94.60%	333	96.20%	735	95.33%	61.20%	92.00%
Other		5	1.20%	5	1.44%	10	1.30%	n/a	n/a
Total per category		425		346		771			
N= 771. 12 null cases were excluded.									
VA,WV data from https://www.census.gov/quickfacts/fact/table/VA,US/PST045221 and https://www.census.gov/quickfacts/fact/table/WV,US/PST045221									

Table 3 indicates that both interview and survey respondents were older than the state median. This is partly because the research specified that respondents be over 18 years old, and partly because state median age data does not exclude residents 18 or under. The data also indicate little difference between the ages of interview and survey populations, and little variation among counties or the two states. Age, as mentioned earlier, is an important component of place attachment, since it develops over the life course.

Table 3. Interview and survey mean ages and state median ages.

	Interview	Survey		State
County	Mean	Blast Z Mean	Control Z Mean	Median
Giles	57	63	63	VA
Montgomery	73	61	67	
Franklin	66	61	66	
Craig	(blank)	(blank)	62	
Roanoke	64	62	65	
Pittsylvania	63	66	65	
VA Average	65	62	66	38.2
Monroe	64	67	67	WV
Greenbrier	63	63	65	
Summers	65	68	67	
Fayette	(blank)	67	63	
WV Average	64	66	66	42.4
The median age of all residents in both states is 64.9 years.				
Survey N= 773. 10 null cases were excluded.				
VA, WV state averages from U.S. Census Bureau, 2017 American				
Community Survey.				

The sex distribution for interview and survey respondents was approximately the same. For the interviews, 52% were male and 48% were female. For the survey, 53% were male and 47% were female, with one respondent identifying as “other.” The interview sample therefore closely approximated the survey sample. The sex distribution for both survey and interview samples was skewed toward male sex identification compared to the total U.S. population, and is much more skewed when considering only the U.S. population of men 65 years and older in 2020. This information is summarized in Table 4. I did not assign sexed pseudonyms for the landowners in this study, and neither did I identify respondents by age. Neither of those

demographic factors was central to my argument. Work history, indicated by occupation, and geographic (county and state) location were considered important, so that is how I identified respondents' comments.

Table 4. Interview, survey, and U.S. distribution by sex.

	Interview	Survey	U.S. Population	U.S. Population
	N	N	Total %	65 YO and older %
Male	13	410	49.2	44.4
Female	12	358	50.8	55.6
Other	0	1		
U.S. Population data from 2020 American Community Survey of the U.S. Census Bureau.				

Survey respondents from the blast zone and control zone had similar levels of educational attainment. However a comparison with U.S. averages reveals that survey respondents were considerably more educated than the national population. For the U.S. population 65 years and over in 2020, 85.4% had a high school or higher degree. 95.4% of the survey population, by contrast, had a high school or higher degree. The contrast is even more pronounced for those with a bachelor's degree or higher: the U.S. population is at 28.3% but the survey population is at 40.6% (U.S. Census Bureau 2020). Table 5 shows educational attainment statistics for survey respondents.

Table 5. Highest level of education, comparing blast and control zones (raw count and % by category).

		Blast zone	Blast zone	Control Zone	Control Zone	Total
		N	%	N	%	N
Elementary or middle school		5	1.2%	6	1.7%	11
Some high school		9	2.1%	11	3.2%	20
High school diploma or GED		97	22.9%	80	23.0%	177
Some college		96	22.6%	76	21.8%	172
Associate's degree		49	11.6%	30	8.6%	79
Bachelor's degree		80	18.9%	76	21.8%	156
Professional or graduate degree		88	20.8%	68	19.6%	157
Total per category		424	100.0%	347	99.7%	771
N=783-771=12 null						

The U.S. median income for full-time year-round workers with earnings population, 16 years and over, was \$36,280 (2020 American Community Survey of the U.S. Census Bureau). For the survey respondents, the median household (not individual) income from the previous year was approximately \$82,000. This would include two-earner households and retirement income in many cases, since the average age of survey respondents is approximately 66.

Table 6. Household income in previous year, before taxes.

	Blast Zone		Control Zone		U.S.
	N	%	N	%	%
Less than \$10,000	4	1.0%	9	2.8%	1.60%
\$10,000-\$19,999	20	5.0%	14	4.3%	↓
\$20,000-\$29,999	40	10.0%	31	9.3%	↓
\$30,000-\$39,999	39	9.8%	30	9.3%	↓
\$40,000-\$49,999	45	11.3%	34	10.5%	47.90%
\$50,000-\$74,999	73	18.3%	71	21.9%	22.30%
\$75,000-\$99,999	63	15.8%	43	13.3%	11.40%
\$100,000-\$149,999	69	17.3%	47	14.5%	↓
\$150,000 or more	45	11.3%	45	13.9%	28.10%
Total per category	398		324		
N=722. 61 null cases were excluded.					
U.S. income data from the 2020 American Community Survey of the U.S. Census Bureau.					
U.S. income data below downward arrows includes arrowed categories.					
U.S. income data are for individuals 16 years and older with full-time year-round earnings.					

This brief characterization of intercounty and interstate descriptive demographic characteristics of survey and interview respondents concludes with two tabular representations of the number of years the families of survey respondents have lived in the same county. The first table shows raw numbers, and the second is a heat map that clearly shows the extraordinarily long time residents' families have been attached to the same area: almost 50% within the same county for more than 100 years. A darker gradient indicates a longer family tenure.

Table 7. Family Tenure in Years, by County.

	Family	Family	Family	Family	Family	Family
	In County	In County	In County	In County	In County	In County
COUNTY	< than 10	10-25	25-50	50-75	75-100	>100
Giles	7	10	16	6	9	45
Montgomery	5	15	18	11	7	31
Franklin	20	29	41	13	21	129
Craig	1	2	2	0	1	0
Roanoke	4	6	12	7	3	4
Pittsylvania	7	8	9	9	16	75
SUBTOTAL	44	70	98	46	57	284
Monroe	3	6	15	5	3	48
Greenbrier	7	6	6	3	7	26
Summers	1	7	4	7	2	20
Fayette	0	0	1	0	1	0
SUBTOTAL	11	19	26	15	13	94
TOTAL	55	89	124	61	70	378
N=777. 6 null cases were excluded.						

Table 8. Family Tenure in Years, by County, Heat Map

	Family in	Family in	family in	Family in	Family in	Family in
	county	county	county	county	county	county
COUNTY	< than 10 yr	10-25 yr	25-50 yr	50-75 yr	75-100 yr	>100 yr
Giles	0.075	0.108	0.172	0.065	0.097	0.484
Montgomery	0.057	0.172	0.207	0.126	0.080	0.356
Franklin	0.079	0.115	0.162	0.051	0.083	0.510
Craig	0.167	0.333	0.333	0.000	0.167	0.000
Roanoke	0.111	0.167	0.333	0.194	0.083	0.111
Pittsylvania	0.056	0.065	0.073	0.073	0.129	0.605
SUBTOTAL	0.073	0.117	0.164	0.077	0.095	0.474
Monroe	0.038	0.075	0.188	0.063	0.038	0.600
Greenbrier	0.127	0.075	0.075	0.055	0.127	0.473
Summers	0.024	0.171	0.098	0.171	0.049	0.488
Fayette	0.000	0.000	0.500	0.000	0.500	0.000
SUBTOTAL	0.062	0.107	0.146	0.084	0.073	0.528
TOTAL	0.071	0.115	0.160	0.079	0.090	0.486
N=777. 6 null cases were excluded		Darker gradient indicates longer family tenure				

The importance of this descriptive representation becomes apparent in subsequent discussion. It is a demonstration of deep cultural rootedness in these pipeline communities. The tabulated data also demonstrates that, in general, the interview sample is representative of the survey sample. However, the data shows a geographic area that has low population density, is whiter, skews toward more men than women, is somewhat more educated, is older, less affluent, and has longer land tenure than the general U.S. population. Thus, it is important to interpret the survey and interview data with the understanding that those who responded to the survey represent a more educated and higher-income subset of the population who lives in the study

area. The findings may be important for interpreting the economic self-interest, political ideology, and safety concerns that influence property owners' attitudes toward the pipeline.

B. First aim: Explore the influence of three factors: economic self-interest, political ideology, and geographic distance, on residents' attitudes toward the pipeline project

My strategy to achieve the first aim of this research was to design and conduct a study that could determine whether perceived economic self-interest, internalized neoliberal logics, and concern for spatial distance found in energy *production* sites, such as fracking communities and certain mining and milling operations, also applied to attitudes toward this pipeline, as an energy *transmission* site, therefore extending the literature in an unexplored direction that is important to environmental justice communities. This section uses quantitative data from the survey and qualitative data from the interviews to explore the link between three factors that prior research suggests are sometimes important drivers of attitudes toward environmentally hazardous infrastructure projects.

Specific objective #1: Previous research suggests that *economic self-interest* may influence public perception and attitudes toward projects that are potentially harmful to people and/or the natural environment. Economic self-interest may range from the personal to considerations of one's family, local community, region, country or the entire world. The survey provided a specific measure that may serve as a proxy for economic self-interest: "Have you signed an easement with the pipeline company?" The survey also provided a proxy for a landowner's attitude toward the pipeline project: "Do you feel that the MVP has negatively/positively/or has not effected your quality of life?" Using these variables, Hypothesis #1 is framed as follows: The null hypothesis (H_0) is that there is no statistically significant

association between economic gain and attitude toward the project. If the null hypothesis is supported, it suggests that property owners' attitudes are not influenced by economic self-interest. If the null hypothesis is not supported, (H_a) it suggests that property owners may be influenced by economic self-interest. For this and all other tests, $p < .05$. The independent variable was operationalized in terms of the response to the question, "Have you signed an easement with the pipeline company?" The dependent variable was in response to the question of how and whether the pipeline has affected the respondent's quality of life. A chi-square test of independence was used to determine whether these two categorical variables are independent of each other. The test yielded a $\chi^2 (2, N= 163) = 3.39, p < .05$. The result is not significant at $p < .05$. *I do not accept the alternative (non-null) hypothesis that there is a statistically significant association between economic gain and attitude toward the project.* I also used Cramér's V as a strength test for χ^2 . The Cramér's V was .10. With 2 degrees of freedom, that is considered a small effect.

The survey, to summarize, indicated a nonsignificant relationship between economic self-interest and attitude toward the project. My interpretation is that the pipeline developer's economic inducement for granting an easement allowing the pipeline to cross a landowner's property did not affect property owners' attitudes toward the project. Put simply, to quote Paul McCartney, "Money can't buy you love." However, the finding of a nonsignificant relationship between the variables does not capture the range of responses to questions about the economic implications of the pipeline project. That was apparent from responses by property owners in both the survey and in property owners who were interviewed for this project. Table 9 shows code categories from the interviews that may be relevant to the connection between economic self-interest and attitude toward the pipeline project. All codes and the thematic structure are in

Appendix B. The number of references to relevant code categories suggests the complexity and variety of connections between economic self-interest and attitudes toward the pipeline. A few examples from landowners with different positions will suffice.

Table 9. Code Categories for Economic Self-interest and Attitude Toward the Pipeline Project

Code category	# of references
economic benefit	90
economic harm	75
emotional effects of the pipeline	64
comparing pipeline supporters and opponents	53
misinformation	51
acquiescence	43
exploitation	32
eminent domain	28
easement	18
pipeline representatives	16
economic mismatch betw. MVP and opponents	12

Among supporters of the pipeline is this survey comment by a landowner in Pittsylvania County, Virginia: “I have been well pleased with my dealings with Mountain Valley including the easement payment. I feel the pipeline is a plus for all citizens of this area.” This feeling is echoed by another resident, a dairy farmer also from Pittsylvania County: “And I know people that got 15 times the assessed value to come across property. So when these people tell you that they take the land, they just flat out lyin’.” Another, a farmer in Giles County, Virginia, opposes the pipeline, but sympathizes with a cousin in Pennsylvania who gets more money from fracking than he does from farming. And on a global scale, an insurance salesman I interviewed in Pittsylvania County, Virginia stated that “natural gas is certainly a cleaner form of energy than

coal... from an economic standpoint, anything that the United States can do to become energy independent, yeah, I think it's a good thing." This reflects Moscovici's (1976: 285-286) argument that it is the rule rather than the exception that different rationalities coexist side by side.

Some property owners I interviewed expressed what could be called quiescence, such as the retired textile mill project manager from Franklin County who said, "Well, the only benefit I really got was the payout. If I was needing to send kids to college that would really help at the time, but all my boys are 50 years old. They are long past [laughs]. I'd have loved to have had it." "Now, all I can do is give my pay out to my grandchildren.' Maybe I'll have to send them to college anyway [laughs]." His passive resistance to the pipeline is expressed as follows:

Ones I talked to was against it to begin with, and still are and I don't know anybody that was really for the pipeline. So, you know, there's a hundred percent of us against it and none of 'em was for the thing, regardless of whether they got the payout.

His statement speaks to the social aspect of evaluation, as well as the lack of association between economic benefit and support for the pipeline.

Quiescence, and also Lukes' second dimension of power, were also expressed by a retired public administrator in Roanoke County, in discussing the terms of MVP's easements:

They're not allowed to talk about it. Once they've settled, they're under a gag order. That's part of the agreement. They say they're not allowed to talk, say anything for or against the pipeline. [S: And people are pretty much sticking to that or do they ignore it?] Well, they stick to it. You live in the country, people's word is gospel in the country. So if they say, they're not going to say anything about it, they don't say anything about it. And if you ask them a question about it, they just say, "I can't say anything about it."

My interviews revealed what I suggest is a connection between opposition, quiescence and cognitive polyphasia. I do not believe this connection to quiescence has been previously

discussed in the literature. Landowners who granted easements to the pipeline developer in return for a monetary payment were often quick to register their nonsupport for the pipeline project. This may have been due to a lingering sense of cognitive dissonance, as reviewed earlier. However, social representation theory includes the concept of cognitive polyphasia, which describes the ability to maintain seemingly incompatible attitudes with little or no stress. I observed this lack of stress among landowners who described active opposition for the pipeline, but nevertheless accepted easement payments, and also among quiescent landowners, who passively opposed the project.

Some landowners say that the pipeline developer's claims are tied to a supposed economic benefit that justifies the taking of land through eminent domain. One person from Montgomery County said, "If you're building an interstate highway, if you're building a new school, if you're building a water treatment plant, if you're building something that is for the common good, then eminent domain is very, very important. You know, you have to be able to do it because you've got somebody who says, "I don't want a water treatment plan on my property", or something like that. Well, if it serves 50,000, a hundred thousand people in your community or something like that, it's a necessary evil, if you want to call it that."

However, he also says, "This is a private for-profit company that's trying to make a profit." That last statement undermines part of his argument, because eminent domain is often justified, even when profit is made, if there is an overwhelming benefit to the public, relative to its cost to private owners of property. This is a clarification conveyed by my interviewee who is a retired legal professional with experience in this area.

This respondent also says he has a friend in business who has profited from the pipeline workers, quoting him as saying, "this has been a real gain for me because these guys, they come

in for lunch every day to my store and they buy food,” and said, “they pay me to use my land over there to park their trucks, and have all their stuff set up and everything.” But he is quick to say that much of the economic benefit is not going to local labor: “the people that are actually the bulldozer operators and, and the welders and everything, they’re from Oklahoma or Texas or somewhere. That’s who’s getting shipped in here to do this, because they’re high skill, and those are the ones getting paid a hundred dollars an hour. An opponent of the pipeline, a fiddler from Roanoke County, says most trucks are from out-of-state, with no front tag (vehicles registered in Virginia have two license plates). The job benefit, for one Montgomery County, Virginia, custom woodworker also accrues mainly to those with out-of-state license plates. He says, “McDonald’s might get a little money from lunch, but in the big scheme of things, they’re not doing anything to help anybody.”

Another point of view from a resident of an economically stressed county also claims a sorely needed benefit to the local economy:

I think it'd be progress for Franklin County. I want it done and over with because right across, like within a mile of here is the new Franklin County Industrial Park. And if we get natural gas, once they get that gas and it's piped, it'll be piped into there. And once it's piped into there, it's going to be great for the county, because a lot of businesses want natural gas to run their operations. So I'm, I'm for it. I think it's a great deal.

It remains to be seen whether this gas tap will actually be installed, but this was part of the inducement that pipeline representatives dangled in front of citizens and elected officials. This property owner’s concern for the local economy and his support for the pipeline project is consistent with Gravelle and Lachapelle’s (2015) finding that people who report concern for the fragility of the economy were more supportive of the Keystone XL pipeline. Another person from nearby Pittsylvania, which is primarily agricultural, said that farmers welcomed the

pipeline as just another revenue stream that supplements an ever-changing mix of ways to eke out a living on the land.

Even if the gas is shipped, with no local economic benefit, some people such as another retired farmer from Franklin County, said, “if they want to buy it [natural gas], that’s money coming into the United States instead of money going out of the United States.” He then says, “the corporations are sending too much money out of this country as far as I’m concerned.” This perspective indicates agreement with one strand of neoliberal political rhetoric.

Several property owners challenged the pipeline representatives, only to see the pipeline skirt around the edges of their property, where neighbors sold an easement to the pipeline company. A retired engineer in Pittsylvania County, Virginia, described his experience like this: “And the only person who really, I think, wanted it, the gentleman across the road, he wanted it, but he wanted money and that’s where it ended up going.” He was resigned to the probability that the pipeline would get built, but told one right-of-way agent, “whoever comes out there on a bulldozer, excavator if they go tear my house down, better tell them to wear Kevlar that day [laughs].”

These quotes illustrate but a part of the range of connections between economic benefit and landowners who support, oppose, or express either passive acceptance (acquiescence) or passive opposition (quiescence). The quotes are all from property owners whose land is partially in the blast zone, so, unlike those who live further from the pipeline, they are likely to have some kind of opinion, rather than mere indifference. Although we see from the quotes that there are diverse and strongly held claims regarding economic effects of the pipeline, for the majority of these property owners, attitudes regarding the pipeline project were shaped by other factors.

Another factor with support from the research literature claims that attitudes toward a contentious environmental infrastructure project can be predicted based on political ideology.

Specific objective #2: Previous research suggests that people who hold a conservative political ideology tend to have libertarian and neoliberal views that support minimally regulated development such as infrastructure projects. The survey data may either validate or challenge connections between any form of political ideology and attitude toward energy infrastructure projects. This specific objective was tested with Hypothesis #2. The null hypothesis (H_{20}) is that there is no statistically significant association between political ideology and attitude toward this pipeline project, suggesting that property owners are not influenced by political ideology. If the null hypothesis is not supported, (H_{2a}), there may be an association between political ideology and attitude toward the pipeline. As indicated in the methods section, the independent variable is derived from survey question 90: “How would you identify yourself on the political spectrum, collapsed from the original 8-point Likert scale to three possible responses: liberal, moderate, and conservative. This is equivalent to the measurement strategy used by Bell and associates (2022:5). The dependent variable is again a proxy that indicates how and whether the MVP has affected the respondent’s quality of life. An answer of “1” indicates a negative effect. An answer of “2” indicates a positive effect. An answer of “3” indicates no effect on the respondent’s quality of life. A chi-square test was used to determine whether these two variables are independent of each other. A chi-square calculated value that is greater or lesser than the chi-square critical value indicates whether the null hypothesis is accepted or rejected. The test yielded a χ^2 (4, N=711) = 46.92, $p < .05$. The result is significant at $p < .05$. *I accept the alternative (non-null) hypothesis that there is a statistically significant association between political*

ideology and attitude toward the project. I also used Cramér's V as a strength test for χ^2 . The Cramér's V was .09. With 4 degrees of freedom, that is considered a small effect.

I accept the alternative (non-null) hypothesis; that is, the data support the conclusion that *there is a significant association between political ideology and attitude toward the pipeline project*. Cramér's V indicated a small effect. The contingency table revealed that liberals oppose the pipeline in much larger numbers than might be expected, whereas the number of conservatives who express support of the pipeline is approximately the number that would be expected. I interpret this result as a weak association between political ideology and attitude toward the pipeline that is more the result of liberal opposition than of conservative support.

117 (16%) of 722 valid cases in the survey identified as liberal, 174 (24%) identified as moderate, and 432 (60%) identified as conservative. If the survey population reflected the kind of support for free market ideology and policies that deregulate industries that prior research has associated with support for “sites of acceptance”, I would expect a stronger association between political ideology and support for the pipeline project, but that was not reflected in Hypothesis #2. Again, it is necessary to examine the interview data for insight.

Prior research (Malin 2014; Malin and DeMaster 2016; Malin et al. 2017) argues that “sites of acceptance”, where, for better or worse, communities support projects with potentially harmful environmental effects, may be communities that identify with a conservative political ideology. Since this ideology includes support for free markets and deregulated industries, strategists for the Mountain Valley Pipeline may have anticipated minimal opposition in such conservative communities, but that has not been the case in many counties along the pipeline route. For insight into why there has been such opposition in such conservative communities, I examined data from the code categories shown in Table 10.

Table 10. Code Categories for Political Ideology and Attitude Toward the Pipeline Project

Code category	# of references
rural values	85
political ideology	72
opposition	62
comparing pipeline supporters and opponents	53
recreancy: distrust of authorities	50
lack of agency	47
Exploitation	32
activist network	31
community benefit, building community capital	22
tactics or strategy of MVP	22
key player in network	17
spillover	14
economic mismatch betw. MVP and opponents	12
recruitment into opposition	11
political/legal strategy of pipeline opponents	9

Landowners along the pipeline route often mentioned a connection between rural values and their attitude toward the pipeline project. One landowner in Monroe County, West Virginia, described her property as a remote wilderness haven that she must protect from aesthetic harm, including intrusion from uninvited people such as landmen.

You have the feeling that you have a place that is natural, and you have some sense that you have some control over it ‘cause you own it.” “It’s not just what the property was for us, but what it could be for our children and grandchildren after us. And there are just fewer and fewer places on the world where you have the kind of just untouched nature that we had there. And then to realize that a pipeline could just come through it without our permission, we would have no say in it, it was really kind of devastating.

Many people I interviewed felt discomfort with having to declare whether they were liberal or conservative. The labels no longer seemed to apply to them. When I asked why he thought the pipeline came through such a rural area, one respondent explained,

It was probably just like the cattle out here, you see. When we had 'em, they built a path. The reason they built that path, it was the easiest, quickest path to get there. And these are cows. And I think the humans are kind of the same way with it; they just go on the easiest path.” “I would imagine they probably also were thinking about if there's gonna be any opposition. Well, it's better to kind of do it with minimum owners to get it done. So let's go with those people that have more land or more plots. So it's fewer people we have to negotiate with. And probably it's cheaper. They know it's cheaper to get in here in this way. And you know, they probably know something about the politics, having done this a lot of times, that maybe rural people are more likely to be more accommodating than people from more urban areas. You know, that may be in their thinking here. Accommodating, or collaborating, maybe, or non-antagonistic.

This view was from a person who, along with his family, has deep roots in the county where they reside. He identified as conservative, but did not associate his attitude toward the pipeline with a particular political party. Along with many other rural landowners, strong attachment to property translated into an ethic of environmental protection. If this meant fighting Mountain Valley Pipeline, it was not inconsistent with their conservative values that they were critical of court rulings that sided with the developers. On other issues, they might favor minimum government regulation of business, but not when eminent domain rulings robbed them of control over their land. Said one staunch political conservative from the mountains of West Virginia, “I don't know who's paying off who. I mean that seems to be the consensus is somebody's... paying somebody to get it signed off and approved. Nobody that we know has approved it or wants it to happen.” But the issue is complex. One farm owner in Monroe County, West Virginia, says that in her very conservative area, people are just brainwashed into being exploited. She says the state has a history of it. “I’ve heard that we’re the only state in the nation that ever had an office on Wall Street, encouraging people to come in and take advantage of us.” This implies that her neighbors

passively accept, or acquiesce, when big business has plans for their community. Said one person who retired to Monroe County after a lifetime of work in a metropolitan area, “Yes, there are things that affect my life that I get frustrated [about]. I’m a competitive person and I hate to cry uncle, but sometimes you just have to, and I guess that’s where I am with the pipeline right now.” It is not that she does not care, but more that “there’s nothing that can be done.” She felt “outgunned. Outmanned.” So this is her political ideology: much more complicated than can be captured in the choices of a Likert scale.

Many people who expressed some sort of activism, and some who ultimately signed an easement, were distressed by neighbors with a different ideology, who are indifferent, that “just don’t care.” Some respondents claimed that their neighbors would pay attention only if an issue became politicized. “Now if you put an R beside it or a D beside it, they would care about it.” This is the idea behind the argument by Campbell and associates (1960) that party identification is a convenient filter in the formation of a political position. But a number of people I interviewed said that unless an issue affected them personally, their neighbors could not be bothered with it, which reflects Downs (1957) classic description of individuals who are not sufficiently incentivized to form an opinion. Among many property owners who oppose the pipeline, organized opposition in the form of asking for support from elected officials seemed like a fool’s errand. That sentiment was expressed by a retired librarian from Giles County:

I’ve been politically active in the past, but you know, I’m not going to be one of the people that goes out and sits in a tree for a couple of years. That’s just not me. I admire these people for doing that, but it’s not me.

Conservatism can mean many things. Among rural Appalachian people, it does not necessarily translate into activism or political ideology. Indeed, the politically powerful, often

allied with the coal and timber industry, have rarely protected rural people. I heard many pointed critiques of politicians in both Virginia and West Virginia, which I refrain to repeat here.

Appalachian conservatism, with due regard for the possibility of overgeneralization, is in some respects a survival strategy that prioritizes the survival of the extended family, rather than the individual. One person I interviewed attributed this tendency to Scots-Irish heritage, which may or may not be true. To illustrate this tendency toward the conservation of the extended family, I relate this story from Monroe County, West Virginia. The matriarch of the family, let's call her Aunt Sally, found herself in the precarious position of being a widow soon after the birth of her twelfth child. The only skill she had was caring for babies, so she supported her family as the assistant to the local doctor. The door of her farmhouse was always open, because someone might need her services at any time of the day or night. After many years, it became evident to her now grown children that the family farm would have to be sold to pay for her care. In rural Appalachia this was a troubling conclusion, because land is often the only wealth that can be passed down from one generation to another. So the twelve children decided that if one of them would care for Aunt Sally until she died, so that her care would be guaranteed, the other 11 children would give up their share of the property. One 12th of the value of the property was not a great loss for any one of the family, but if all agreed, the property would remain in the family. It was not an easy task, because she insisted that the front door remain unlocked well after her birthing days were done, which unnerved the urban-raised wife of Aunt Sally's caretaker. That's conservatism.

Again, for some rural people, "conservative" means protecting their land: often the only resource they have that can be passed on to their descendants. An 80 year old man from Monroe County explains:

It's amazing how people will hang onto a mountainside thing with a chicken coop on it. It has very little value. But yet it has sentimental value: that was granddad's place, and his daddy was raised on that. There's a lot of that. And not only here. It's kind of an Appalachian thing.

The drive toward conservation of scarce resources in Appalachia recalls Hobfoll's (1988) conservation of resources model, in which the loss of one kind of resource can result in the loss of other kinds of resources. The previous two illustrations demonstrate that rural Appalachian people recognize the need to protect their resources against loss or depletion.

Another insight into rural conservatism may be that it causes a person to focus on the proximal rather than the distal environment, so as not to distract from the necessities of making a living in a precarious environment. This may be an insight into a regional form of quiescence. Here is an example that makes that point, from my notes. This local guy walks in and my informant asks whether he's for or against the pipeline. He's against it, even though it is not near his property. When asked why, he says, "I don't know. I ain't got any particular reason", but there really is a reason. He later says, "I mean, we're not getting' no benefit out of it." When people have lived with precarity for generations, there is an assumption that if something does not have a benefit, the default reaction to it, and one that requires no particular reason, is to oppose it. People who are more economically resilient may choose to just be indifferent to an event that does not directly affect them, but for some rural Appalachian people, the reaction has to be unequivocal. Surviving in precarity requires a clear, low-risk, generalizable decision, with no requirement for explanation: if the action has no benefit, then it must be a cost, and it should be opposed. The speaker saying, "I ain't really got any particular reason" is not a brushoff. It just means that for him, opposition to an unbeneficial event is automatic, part of his deep cultural

knowledge. But he generously supplies a follow-up anyway: “It’s just, do we really need it? I mean, we’re not gettin’ no benefit out of it.”

This example of what might be considered quiescence (passive opposition) is interesting in that it was expressed in terms of a cultural norm by a person who was not in the path of the pipeline. It can be contrasted with a case from Montgomery County in which the speaker is aware of alternatives but has been coerced by those in power.

Every time a person finally signed the contract, then that goes into the column of people who willingly signed up for their land to be used by the pipeline, even though they may have fought for five years and spent thousands and thousands of dollars on attorney's fees. It goes into the category of, well, this was a willing person here, when that’s not the case at all. They finally were worn down.

However, it does not seem accurate to say that this person’s acceptance is passive, except to the pipeline authorities who conflate resignation with acceptance.

There are complexities in the political ideological tensions stirred up by an infrastructure project thrust upon relatively powerless rural communities. The interviews reiterate survey findings that there are no simple and unequivocal connections between political ideology and attitude toward the pipeline. A majority of survey respondents identified as politically conservative. However, many expressed reticence toward any such categorization. This inclination toward restraint in political identity deserves more scrutiny than is possible given the limitations of both the survey and interview data. A number of comments following the question of political identity indicated respondents’ support for the traditional values that characterize social and cultural conservatism, including support for traditional family structures and lack of support for the social safety net, and little support for liberal or progressive social values.

Social conservatism aside, many landowners expressed their political conservatism by emphasizing the neoliberal tendency toward distrust in big government. This was particularly evident in negative descriptions of interactions between landowners and the courts and permitting agencies. People expressed particular disillusion or disappointment with agencies tasked with regulating the pipeline project. This is an interesting position, in which an impacted public expresses support for market capitalism rather than the welfare state, along with the deregulation of industry, but is situationally critical of governing authorities that do not push back against excessive corporate power. This was particularly evident in landowners' critique of eminent domain.

The expression of landowners' distrust was sometimes overt, displayed by opposition. But it was often more guarded, leading to nonaction. The one-on-one interviews provided a safe place for the expression of both passive opposition to and passive acceptance of the pipeline project. Prior research reveals subtle social processes that foster nonaction in coal communities (Bell 2016). Residents in pipeline communities who are not indifferent to the pipeline's effect on their lives often remained quiescent, which is to say that they remained inactive despite their opposition to the pipeline (Bell et al. 2022).

Tables 11 and 12 add nuance to Bell et al.'s (2022:6) finding that resident location (either in the blast or control zone) was not found to be a statistically significant predictor of whether someone whose quality of life had been negatively affected by the pipeline would engage in resistance or resign themselves to silence (quiescence). They found that one of the most powerful predictors of quiescence and resistance were variables linked to a respondent's social networks. As they note:

[T]hose with neighbors supporting the pipeline were nine times more likely to be quiescent, and those who were not sure how their neighbors felt about the pipeline were five times more likely to be quiescent. On the other hand, those who had joined a social media group focused on stopping the pipeline were nine times more likely to take part in resistance actions than those who had not (Bell et al 2022:1).

As indicated in Table 12, survey respondents living in the blast zones of either West Virginia or Virginia record more neighbor opposition than respondents living in the control zone. The 30.2% total in the third column (darker gradient indicates higher percentage) of Table 12 is much higher than the 11.2% total in the fourth column. This finding is exploratory but suggests a more detailed microsocial differentiation among social networks in the investigation of local political interaction.

Table 11. Neighbor Support/Opposition for Pipeline, by Number of Cases

	Neighbors support when S in blast zone	Neighbors support when S in control zone	Neighbors oppose when S in blast zone	Neighbors oppose when S in control zone	Unsure of neighbors when S in blast zone	Unsure of neighbors when S in control zone
VA COUNTY						
Giles	5	10	43	7	16	10
Montgomery	2	6	22	13	15	28
Franklin	20	18	92	27	44	51
Craig	0	1	1	1	0	3
Roanoke	1	1	20	3	3	8
Pittsylvania	15	16	10	8	22	50
SUBTOTAL	43	52	188	59	100	150
WV COUNTY						
Monroe	7	10	24	17	7	15
Greenbrier	8	9	9	5	12	11
Summers	3	2	11	5	9	10
Fayette	0	0	0	0	1	1
SUBTOTAL	18	21	44	27	29	37
TOTAL	61	73	232	86	128	187
N= 768						

Table 12. Neighbor Support/Opposition for Pipeline, by % of Population, Heat Map

	Neighbors support	Neighbors support	Neighbors oppose	Neighbors oppose	Unsure of neighbors	Unsure of neighbors
	when S in blast zone	when S in control zone	when S in blast zone	when S in control zone	when S in blast zone	when S in control zone
VA COUNTY						
Giles	0.007	0.013	0.056	0.009	0.021	0.013
Montgomery	0.003	0.008	0.029	0.017	0.020	0.036
Franklin	0.026	0.023	0.120	0.035	0.057	0.066
Craig	0.000	0.001	0.001	0.001	0.000	0.004
Roanoke	0.001	0.001	0.026	0.004	0.004	0.010
Pittsylvania	0.020	0.021	0.013	0.010	0.029	0.065
SUBTOTAL	0.056	0.068	0.245	0.077	0.130	0.195
WV COUNTY	0.000	0.000	0.000	0.000	0.000	0.000
Monroe	0.009	0.013	0.031	0.022	0.009	0.020
Greenbrier	0.010	0.012	0.012	0.007	0.016	0.014
Summers	0.004	0.003	0.014	0.007	0.012	0.013
Fayette	0.000	0.000	0.000	0.000	0.001	0.001
SUBTOTAL	0.023	0.027	0.057	0.035	0.038	0.048
TOTAL	0.079	0.095	0.302	0.112	0.167	0.243
	N=783-768=15 null.		Darker gradient indicates greater percentage of population			

Specific Objective #3: Concern for spatial or geographic distance from a source of environmental harm often leads nearby publics to oppose such projects, but that is not always the case. Economic and/or political ideological considerations sometimes override the potential for harm to people or the natural environment. My third objective was to see whether a concern for spatial distance often associated with a point source hazard such as a toxic waste dump applies also to the Mountain Valley Pipeline, as a linear hazard that merely passes through a vulnerable community. This objective involved the determination of whether there is an association between the support or opposition that property owners express and whether they live nearby (in the blast zone) or geographically more distant (at least 10 miles from the pipeline).

Hypothesis #3: The null hypothesis (H_{30}) is that there is no statistically significant association between physical/geographic distance from the pipeline and support or opposition for

the project. If the null hypothesis is supported, it suggests that respondents are not influenced by physical/geographic distance from the pipeline. If the null hypothesis is not supported, (H3_a) it suggests that respondents are influenced by physical/geographic distance from the pipeline. The null hypothesis would provide support for arguments such as Malin's (2014) "Yes to the Mill." The alternative (non-null) hypothesis would provide support for other studies (such as NIMBY or place-protective arguments) that find an association between proximity to a hazardous project and attitude toward the project. The independent variable is geographic proximity to the pipeline, determined for each property by empirically precise ArcGIS data rather than the survey response to Question 24: "Is any land you own, rent, or live on located in the "blast zone" of the Mountain Valley Pipeline, because the survey recorded a number of incorrect assessments of location by survey respondents. The dependent variable is a measure of support or opposition. I suggest that it could be considered alternatively as a measure of disruption to landowner quality of life.

A chi-square test was used to determine whether these two categorical variables are independent of each other. A chi-square calculated value that is greater or lesser than the chi-square critical value of .05 indicates whether the null hypothesis is accepted or rejected. The test yielded $\chi^2 (2, N= 763) = 115.71, p<.05$. Therefore, I accept the alternative (non-null) hypothesis that *there is a statistically significant association between attitude toward the pipeline and physical/geographic distance from the pipeline*. Cramér's V was 0.275. With 2 degrees of freedom this is considered a medium effect (a moderate association). I interpret this finding to mean that proximity to the pipeline has an important influence on attitude toward the project. The chi-square contingency tables revealed that the number of residents in the blast zone who are expected to oppose the pipeline (140.4) is many fewer than the observed (205) number of residents who indicated opposition in the blast zone. This is in stark contrast to the number of

landowners in the control zone who are expected to oppose the pipeline: 114.6, but in fact there were only 50 people who opposed the pipeline in the control zone. This is an interesting finding, since it suggests that residents living close to the pipeline are more likely to oppose the pipeline than those who live further away. It clearly demonstrates place-protective behavior. The result is not surprising, given the previous finding that economic self-interest, often in the form of the sale of an easement to the pipeline developer, had no significant effect on attitude toward the pipeline project. The finding is also important because as a linear hazard, the test had a large sample size: 420 in the blast zone, and 343 in the control zone. Point source environmental hazards seldom have such a robust number of specifically located cases.

The interviews for this study are filled with the concerns of people who live in pipeline counties. These concerns are concentrated among those whose property is at least partially in the blast zone, where danger and disruption are greatest. On the other hand, there are those who argue that the potential for harm and any possible disruption are overblown, or they may think any collateral damage is acceptable in the face of persistent poverty or economic insecurity. The simple fact revealed by the foregoing analysis is that people living close to the pipeline are more likely to oppose the pipeline than those who live further away. The lived experience of residents close to the pipeline project are considerably more complex than this simple finding. The numbers of codings for code categories relevant to distance-related issues, shown in Table 13, illustrate the range and intensity of concerns.

Table 13. Code Categories for Geographic Distance and Attitude Toward the Pipeline

Project

Code category	# of references
environmental harm	106
place attachment	82
perception of danger	71
bad action by pipeline contractor	64
emotional effects of the pipeline	64
harm to wells or water	48
distance from pipeline	45
personal harm, danger, or risk	41
local knowledge	32
aesthetic harm	30
psychological or physical stress	30
risk perception	28
pipeline explosion	26
description of construction	26
sense of place	20
disruption to sense of place	15
displacement or NIMBY	14
water quality issues	11
geological harm, karst topography	5

As previously noted, all 25 of the interviews for this study were with residents whose property is at least partly in the blast zone. The choice of that location was intended to amplify concerns regarding either physical danger or disruption to residents' sense of attachment, identity, or dependence on the place where they lived. If those concerns were overridden by other factors, I wanted to know about that too. The range and complexity of responses, both among supporters and opponents of the pipeline project, were instructive. Sometimes they confirmed my expectations, and sometimes they challenged my preconceived notions. Here are examples that provide insight into the connection between geographic distance from the pipeline

and active opposition, passive opposition (quiescence), passive acceptance (acquiescence), support (active acceptance), or indifference.

Note that residents' attitudes toward the pipeline often intersect in ways that defy easy categorization. Figure 5 suggests one way to organize the relationships among responses to contentious environmental projects. It builds on work by Steven Lukes ([1974] 2005), John Gaventa (1982), and recent work by Bell and associates (2022). Opposition and support are active responses to such projects. Indifference is essentially passive. Quiescence is a passive type of resistance: a resigned silence. So, a gag order from the courts might force quiescence from a person who otherwise might actively oppose such a project. However, there are many other ways by which powerholders stifle opposition (Cable et al. 1999; Shriver 2000).

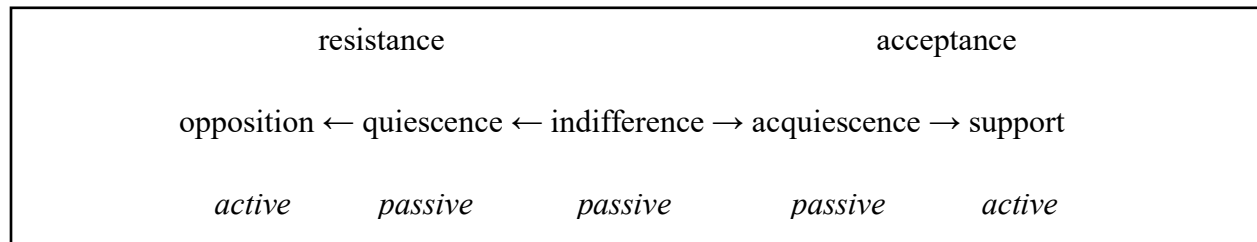


Figure 5. Types of response to contentious environmental projects

Since I met most of the residents on their property, I can say anecdotally that when a resident's house was closer to the pipeline, it seemed more likely that the resident expressed concerns about physical danger. For instance, a large farm may be crossed by the pipeline, but if the pipeline is not close to the farmhouse, the resident may be relatively unconcerned about physical danger.

A retired dairy farmer from Franklin County, Virginia, expressed his lack of concern for being in the blast zone with this comment, as an example of support for the pipeline:

It could be a lot closer to our house and I still wouldn't be concerned. As I told one of the gas line workers, the only thing that bothered me... he says does anything bother you about it? I said, oh, one thing bothers me about it. I said, when they first decided they were going to put it through here, I was on the right-of-way and I was going to get money off of it. I said, now then they went and moved the damn right-of-way. And now I'm getting nothing [laughs]. I said, that's the only thing that bothered me about it!

Here is another perspective, from the owner of a large dairy operation in Pittsylvania County, who also supports the pipeline, partly out of concern for public safety:

Isn't it far safer to run that gas through a pipeline than it is on a tractor trailer truck comin' down the highway? To transport the gas, you know, it's so much safer by doing it by pipeline than it is by rail or truck, either one of those systems. And that's what these people, if they want to save the earth, it's more feasible doing it that way.

This is an attitude that is based primarily on the perceived statistical probability that the pipeline will explode. A property owner who is a hazardous materials manager expressed it like this: "Very low risk. Very, very, very low. I mean it's a possibility, but it's negligible." As mentioned earlier, FERC staff state that the probability of fatality from an incident is approximately 0.01 per year per 1,000 miles of pipeline (FERC/FEIS 2017b: 4-573). That is to say that there is approximately one death per year for every 100,000 miles of pipeline. "Thus, operation of the projects would represent only a slight increase in risk to the nearby public." (FERC/FEIS 2017b: 4-573). A retired farmer and fire/rescue volunteer from Franklin County who supports the pipeline project echoed that attitude:

Let's just get it over with, let's just get it into the ground and make it green again and quit worrying about it. That's about the way I feel about it. I mean, I know there's a chance it explodes. Yes. Maybe less than 5% in my opinion. So I'm not concerned with it.

The reality of that strictly statistical probability presents a problem to others, such as this retired legal professional from Greenbrier County, West Virginia:

We're just outside of that [the blast zone]. I think our house is like 130 feet [from the outer limit of the blast zone]. But you gotta figure that that blast zone, they're talking about absolute destruction of everything in there, but the debris from that blast zone is gonna travel a whole lot further [laughs]. And being 15 feet away from the edge of it is not gonna help us.

So I would rank it very high over time. If you assume that they continue to run gas through that pipeline, I would say that over the course of 25 years, there will be close to a hundred percent probability that there will be an explosion somewhere.

So you've got 15 miles of a pipeline [between gate stations]. And it's all in inaccessible territory. On roads that are inaccessible. And those issues in the scoping meetings and the meetings for the environmental review that they were required to have, those points were all made by people at the meeting and were just ignored and not really addressed in the final report.

Landowners are often aware of distance-related differences in the level of concern among their neighbors, as in this comment by a retired veterinarian in Montgomery County, Virginia:

The people who live just a mile down the road and are not directly affected or anything, they're just like, I just want them to get the damn thing done with and be done with it. I don't care anymore. And so in that situation you say, well, gee do you not understand the big picture here? I just don't care anymore. You know? And so there, you're almost like, okay, well, I don't care what happens to you anymore either.

Here is a similar sentiment from a Monroe County, West Virginia, resident who opposes the pipeline:

There's a lot of 'em that are [say] You can't stop it. Stop trying to fight 'em and drag it on. Let 'em put it in. Let 'em finish. Let 'em clean the mess up and let 'em get outta here and pray it never blows up. Yeah. There's a lot of those kind of people.

A number of people recognize that they have neighbors who may oppose the pipeline, because they are in the blast zone, but acquiesce out of necessity, like the Roanoke County resident who looks after her older neighbor. "Our neighbor. I mean, she needs some financial help and she got an easement. I don't begrudge her one bit because she needs it. That's not to say, she's still

totally opposed.” Another resident, who lives in a remote section of Monroe County, West Virginia, describes the passive acceptance (acquiescence) of her neighbors:

I know there are some people who were either indifferent or felt like, oh, well, that's some money that I can use. And I can appreciate that. You know, our area is always somewhat economically depressed, but kind of stable economically.

There were residents who may not have acquiesced out of financial need, but neither did they have the means to fight the pipeline. A Franklin County resident whose house is in the blast zone did not even have the satisfaction of selling an easement, because the pipeline skirted around the edge of her property:

We understand that there's not anything we're going to be able to do about it. So yes, we do oppose it, but we're not going to fight them because we just don't have the means to do that. It's going to be what it's going to be, whether we like it or not.

This is a common sentiment of resignation.

For others, no amount of money could compensate for their loss of security. Many of these residents base their opposition on the danger they perceive, even though the probability of an explosion is low, such as expressed in this statement by a hospital administrator whose extended family has lived in Franklin County for more than 200 years:

Before the pipeline affected me directly, I could have never sat down with you and told you anything about a pipeline. It was just a word at that point. It wasn't until it affected me so profoundly. Because now it affected my future. Don't forget, you know, if it was just, oh, they're taking my land away and oh, blah, make a little bit of money. But now my son, my property, my future, my grandkids, they're not gonna be there. Now it affects me directly. So I think that when it doesn't affect you directly, you just don't think or care about it.

So instead of having my loved ones close to me, the way my father-in-law was right next door, and the children were right there. At least our generation got to feel that, right? Grandma, right next door. That's not gonna happen going forward. You know, I'm not gonna have my grandchildren at my feet all day long, because they're gonna be as far away as I can get them. And they as sure as heck ain't gonna live in no blast zone, right? Where every single... once this thing goes live, and this is to me, is the biggest, once this

thing goes live, every minute of every day, I will wonder if I'm going to die. Is that gonna explode and kill me? People say, oh, well that so rarely happens. But it does happen, right? So I can't say beyond a shadow of a doubt that I'm not gonna blow up. I will wonder in the back of my mind, every minute of every day, is this gonna be my last breath?

Prior to starting the interviews, I assumed that, since I would be interviewing people whose property is at least partly in the blast zone, they would be quite concerned with personal, physical danger. Although that was often an overriding concern, after a few interviews it became apparent that the pipeline operator's intrusion into people's property struck an emotional chord that was much more powerful than the low possibility of an explosion. After all, these were self-reliant rural folks whose concern for safety ran more toward copperheads, ticks, the occasional bear, and getting stepped on by a cow. It was not until I had interviewed some folks from the mountains of Monroe, Summers, and Greenbrier Counties in West Virginia that it became clear that the more important danger for many landowners was the threat to their water. The area traversed by the Mountain Valley Pipeline in West Virginia includes some of the world's finest quality aquifers, but their location in the limestone and dolomitic geology renders them unstable and vulnerable to contamination. When the pipeline runs along the ridge top, destroying ancient timber that had been protected from harvest by its sheer inaccessibility, and disturbing delicate karst topography that is key to water quality, people's personal safety often takes a back seat to protecting their water. Many people believe that pipeline planners, sitting in their offices in Pittsburgh, simply drew a straight line between two points to determine the pipeline's routes. Legitimate public scoping sessions, in which pipeline representatives listened to people's comments, might have prevented much damage to land and water, and resulted in much less opposition among those whose property happened to be in the blast zone.

The first aim of this research was to explore whether attitudes toward this site of energy transmission are similar to attitudes in previously studied sites of energy production. I reviewed some of that research in the section ‘economic, political ideological, and distance-related influences on attitudes toward energy infrastructure projects.’ They suggested that in sites of energy production, such as fracking communities, powerhouses, and certain milling and mining operations, perceived economic self-interest, internalized neoliberal logics, and concern for spatial distance are factors that influence public attitudes toward environmentally contentious infrastructure projects. Although the studies consistently claim that economic, political ideological, and distance-related factors influence public perception of contentious energy infrastructure projects, their conclusions are inconsistent and often contradictory. This research and future research that specifically studies energy transmission sites may reveal consistencies that have not been forthcoming for energy production sites. My analysis of survey and interview data indicate that at this site of energy transmission, there is no overall support for a significant connection between economic self-interest and residents’ attitudes toward the pipeline. People’s attitudes, whether they sold an easement or not, were not significantly influenced by economic self-interest. The survey data did indicate a weak association between political ideology and attitude toward the pipeline project, mainly because residents who identified as having a liberal political ideology were particularly likely to oppose the pipeline, rather than residents with a conservative ideology expressing support for the project. As previously discussed, I used interview data to suggest that some of the conservative values of these rural property owners often do not align with the broader ideologies of political conservatism, with its explicit support for free markets and policies that deregulate industries, particularly when people’s control over their private property is threatened. The final objective in the first aim of this research was to

explore the connection between geographic distance from the pipeline and opposition or non-opposition to the project. The survey data and corroborating interview data suggested a connection of medium strength between the two, with opposition particularly strong among residents with properties at least partly within the blast zone.

C. Second aim: Explore a fourth factor: social representation: a process that influences residents' attitudes toward the pipeline

The objective of my second aim was to demonstrate that Moscovici's social representation theory provides an orderly and generalizable process by which members of an impacted population use their prior understandings of similar phenomena to interpret, evaluate, and help decide how to respond to a novel hazardous object or event. The approach is then another way, beyond economic self-interest, political ideological tendencies, or geographic distance, to account for variation in landowner response to an environmental harm. The aim of this inquiry is worthwhile, because neither economic self-interest nor political ideology seem to have much capacity to anticipate public response in the case of this pipeline project. By demonstrating that the owners of property in the blast zone often follow the process, or sequence of events, predicted by social representation theory, researchers and policy makers may gain a more complete understanding of why some people, exposed to the same potential for environmental harm, support what others oppose.

The residents who were interviewed for this second aim all live on property that is at least partly in the blast zone. Interview questions focused on two concerns that are assumed to be relevant in such a high-risk environment: danger and disruption to residents' sense of place. The Interview Protocol, in Appendix A, was designed to follow the sequence by which property owners recognize the unique characteristics of the pipeline project, and then use their pre-

existing conceptions of danger and disruption to interpret, evaluate, and respond to it. This sequence of probes in the interview protocol parallels Moscovici's process by which people become aware of, interpret, evaluate, and act on a novel object or event.

The thematic structure for reporting the results of the interviews consciously and intentionally follows the sequential structure of the interview protocol. The full thematic structure, with codes and numbers of codings are in Appendix B. The interviews generated 828 pages of transcribed and corrected text, including codes and comments. Themes and subthemes are shown in Table 14. The number of times a specific code is attached to the entire body of transcripts is shown in Appendix B. The purpose of including this information is to indicate that the few references cited for each theme are either representative of landowner responses to a specific theme, or are particularly well-articulated insights into factors that inform landowners' attitudes toward the pipeline. They by no means express the entire range of landowners' comments, all of which I acknowledge and all of which influenced the overall decision about which comments to include.

Table 14. Thematic Structure of the Study

1: Awareness: Encountering the pipeline project as a novel event
1a: Scoping sessions: what the neighbors were saying
1b: Dealing with authorities and landmen
1c: Concerns and benefits for self, family, community, region, nation/world
2: Interpretation: Anchoring a novel event to a landowner's social history
2a: Similar experiences
2b: Professional and occupational knowledge
2c: Spillover
3: Evaluation: Danger: Risk to persons and property
3a: Living in the blast zone
3b: Probabilistic thinking about danger
3c: The dangers of rural life
4: Evaluation: Disruption to people's sense of place
4a: Place dependence: generations of ties to the land
4b: Eminent domain as a disruption to place attachment
4c: Place identity: on the land and of the land; indigeneity
5: Response: Support, opposition, acquiescence, indifference
5a: Support: ties to the economy and ideology
5b: Support: ties to the social representation of danger and disruption
5c: Opposition: ties to recreancy and activism
5d: Opposition: ties to the social organization of danger and disruption
5e: Acquiescence and indifference

Awareness: Encountering the pipeline project as a novel event

Moscovici's theory of social representations suggests that a social representation of an object or event such as a pipeline or pipeline project is the product of a socially negotiated

process whereby a previously unknown object or event becomes known. This first section provides evidence that the pipeline is such a novel object and the construction of the pipeline is a novel event.

Many people I interviewed first became aware of the pipeline project through the public scoping sessions, which are part of the FERC process for identifying issues and concerns. A retired public administrator living on Bent Mountain in Roanoke County described one such meeting:

When you're a citizen you know nothing about what's going to happen, you don't know who, or how or why to talk to people about that stuff. I don't know whether they're going to be blasting, trenching, digging, riding horses, you know, laying down scotch tape and peeling it back. You're too uninformed in order to be informed, at that point. And that was what was so bad about this whole thing from the get-go. We were all so naive about everything that was getting ready to happen to us, that we didn't know even how to go about finding out what was going to happen to us.

Residents attended the scoping sessions and other informational meetings so they could grasp the scope and potential impact of the project. One resident found the 900 plus pages of the FEIS to be a barrier to understanding. Another says that pipeline authorities structured the meeting so as to limit group conversation, by steering people into one-on-one sessions with pipeline representatives. The times scheduled for the meetings also presented a barrier to understanding this unknown project. "And of course they're during the week when everybody's working so do I go to work or do I go there and not get paid?" So people, deliberately or not, were kept in the dark. This kind of experience is all too common, not only in oil and gas development projects, but also more broadly. "This kind of power is typically afforded to groups of higher socio-political status who have the power to construct what is 'real' or 'true'" (Howarth et al. 2014:2). One landowner in Greenbrier County, West Virginia, said that "if you're rural, you're running from dawn to dusk as a farmer and you don't have time." These comments

suggest that early on, the pipeline project was both unknown in people's personal experience, and often unknowable. There were a number of residents who referred to the informational sessions as "dog and pony shows." For example, one resident from Roanoke County, Virginia said, "I went to the one at Cave Spring [high school]. That was a dog and pony show, put on by them. They wouldn't allow people to make comments." People struggled to put the project into some kind of context, often without success, because it was comparable to nothing they had ever experienced. This property owner says, "I think they provided the opportunity, but nobody knew they needed to go and take advantage of that opportunity." Sometimes the pipeline project remained an unknown because of indifference. The previous property owner said, "And we, as the people who are affected and are appalled and are trying to stay abreast of what's going on, have attempted to make our neighbors aware and provide them with additional information, but they don't care." Sometimes the indifference is less than uncaring, but rather like aversion, as with this person from Monroe County, West Virginia:

I work as a teacher, with really well educated people. And [when] I would talk, you would think that I brought up the plague or something. Nobody wanted to talk about it. I would bring up the conversation and it would almost be like, you're talking about a taboo subject.

People learned early, through meetings, the media, and neighbors, that this pipeline would be a unique event, not only for them, but also for the pipeline owner. One landowner in Monroe County, West Virginia, recognized what many others expressed as they became aware of the pipeline: "It's a 42 inch pipeline. They've never built one that big before." The wife of a propane hauler said, "We specifically have never experienced anything like the pipeline." Her concerns for what she does not know about the pipeline itself are specific:

Yeah. I mean, who knows what that coating is really made of? Who knows how long that coating's going to last? Who knows if the coating that's on the inside, it's not going to flake off into that gas or into that water? Who knows if ... there's a lot of "what ifs?"

What if it rusts and all of a sudden they're running gas through it and it hits air or some spark or something and Kaboom! I mean, we don't know. I mean, we do know that where it is that if it ever did explode, we in this house would probably never know it if we're here.

Property owners generally expressed skepticism when pipeline company representatives at meetings tried to normalize the project. A hospital administrator who lives in Franklin County expressed her incredulity by saying, “Think about it [a 42” pipeline]. It’s never been done before. And with the rolling of the hills, going up and down the mountains. Yes. Am I the only one that thinks that way? It terrifies me.” Another landowner from Franklin County described being served a notice to appear after refusing to sign an easement: “And when our guy comes and serves your papers on your property, says you are required... you’ve been served, come to federal court. Man, that was something I’d never been through.” People sometimes expressed the feeling of being blindsided by this event, such as this description by a graphic artist in Franklin County:

But when this got here, this was real, big real, this was us at our homes and where we work and it was people. It was, you look out the window and all of a sudden there'd be three guys walking around, out there. Hmm. And what's going on?

Confusion was one initial reaction to the pipeline. Sometimes it led to alarm, but for a retired legal professional, familiar with organized protest by motivated citizenry, one of the unique aspects of the pipeline project was people’s indifference:

The most startling thing to me was people’s reactions and their feelings of helplessness. It just never occurred to me that people would not feel that they had the right and the... power's really not the right word, but they had the right and should think about whether or not they should take action about this because it was such a knee jerk reaction from people that, “well, it’ll come, whether we want it or not, we can't stop 'em.” And I actually turned to my neighbor and I said, “we won't stop 'em if people have that attitude and don't do anything,” and they look kind of thoughtful for a minute [laughs].

At that very moment the neighbor's indifference embodied Olson's (1965) concept of the 'free rider', in the sense of a willingly suspension of political power.

The unfamiliar or uncertain character of the pipeline project was not always described in terms of its potential for harm. One retired farmer in Franklin County enthusiastically approved of the pipeline, partly because he said the pipeline developer promised to provide a gas tap for the county's industrial park. He argued that the pipeline is a rare and welcome economic opportunity for the county, even though there is little evidence that the gas tap will be installed.

I mean, it's not only going to benefit me personally, but it'll benefit the whole county. We'll have more employment here in the county, more industry which will bring more employment. Franklin County used to be a rural county with a lot of dairy farming and a lot of farming: tobacco and dairy and the tobacco is probably almost totally gone, and there's only a very few dairy farmers left in the county. So actually, we need employment here in the county.

Property owners described the pipeline with words that differentiate it from their everyday knowledge of familiar, predictable objects and events in their lives. Those descriptions of their first encounters with the project suggest confusion, skepticism, alarm, and helplessness, exacerbated by a lack of knowledge about the project's potential for harm. These feelings are similar to those reported by victims of technological disasters, such as Ritchie (2012) described following the Exxon Valdez oil spill. However, some supporters welcomed or at least approved of the project, claiming that the pipeline provided unique opportunities for economic gain.

Interpretation: Anchoring a novel event to a landowner's social history

The pipeline, initially an unfamiliar object, becomes familiar through a process of interpretation and evaluation. It is a sensemaking process, yielding new knowledge that is then available for coping or action. This section presents evidence for how property owners engage in socially mediated interpretation. They do so by linking or "anchoring" the pipeline to experiences that are at least subjectively similar to the pipeline, often by drawing upon their

earlier occupational or other life experiences. These experiences may include spillover from prior oppositional activity. The anchoring knowledge, value, belief, or ideology may be used to assign either contrast or similarity. Notice in the discussion that follows how often ambivalence is resolved by attaching either a positive or negative valence to the object. The unpredictability of an object or event can be normalized by reference to similar phenomena, as Shetland Islanders did in the example of the *Braer* oil spill (Gervais 1997) cited earlier. Similarly, blast zone property owners often considered the pipeline as no more threatening than copperheads, ticks, or being stepped on by a cow. Like the Shetlanders, who were more concerned with the maintenance of their livelihood in the fishing industry, pipeline property owners were often more concerned with threats to their water than threats to their physical safety.

An insurance salesman with blast zone property in Pittsylvania County, Virginia, sets the Mountain Valley Pipeline within a familiar context by his recollection of a colleague in an office in Pennsylvania when that was a part of his territory.

...you talk about pipeline hatred...she loved out there, the ruralness and just how pristine and away from everybody. And she loved that. And they had a little land there. And man, when that fracking started... they left in about two years, they just said they'd had enough of the trucks and all of the activities and so forth. But she would say she hated the pipeline; a nice lady, but she didn't want no part of that [laughs].

This man is generally supportive of the Mountain valley Pipeline, but renders it familiar by contrasting it with his memory of a person's antipathy toward fracking activity. The pipeline gains meaning as he recognizes a similarly contentious project, clarifying and giving valence to his own position.

The function of an anchor is to give an unknown a familiar face. The tethering of an object to the familiar, as discussed in Chapter 1, serves to reduce the threat of the unknown, similar to how the tethering of a boat to an anchor prevents collision with unknown hazards.

When I asked a person living on Bent Mountain, in Roanoke County, whether she had ever experienced anything similar to the pipeline, she said, “No,” but then recalled situations that had affected not her, but the community where she lives:

Up here, the community had had several things of that nature that were coming through here. They were going to put a windmill farm up on top of Poor Mountain and the community raised hell about it and went up in arms. And I think it just wasn't viable, but you know, the windmill farm backed off. [S: Viable?] Financially. I don't think it had anything to do with the communities. And so I-77 was originally scheduled to come right up and follow I-73. It was going to connect somewhere down around I-77 I think. And the community fought back on that one. And I think it was community input that had that moved to [Route] 220.

This property owner's opposition to the pipeline is made familiar by linking it to two other projects she knows about from discussions with her neighbors. The unfamiliar is re-presented, in the sense that it transfers something that is far off, but known, to something that is close by, but unknown and threatening.

There is a similar reduction of the pipeline's novelty to an ordinary category in a Franklin County man's reference to his special knowledge of explosive gases:

I mean, we had one lady that, coming up over here, when you first found out about it, she had one of those signs that read about the pipeline, about exploding. I forgot what it was. Oh, “You're in the blast zone.” It didn't bother me. I was a volunteer fireman. I know what a blast zone is. I've been there.

He explains,

I been at the back of a tractor trailer full of gas while they were offloading part of it while there was a two-by-four [board] sticking through the side of it. And I went to the back of it with an inch and a half hose. That's a blast zone. Because if that thing gets lit, hey, forget it! [laughs]

This is an interesting inversion of the precautionary principle (Bullard 2005:28), because his training, which should have instilled caution, instead instilled confidence that the pipeline, by contrast, was relatively safe, justifying his support for the project. So instead of advocating for

‘how little harm is possible?’, his professional background led him to respond with an attitude of ‘how much harm is allowable?’. This is an example of how the categorization of an unknown object can be achieved by anchoring it to a familiar memory, irrespective of whether that categorization is consistent with objective reality.

Here is another example of how a person’s awareness of the pipeline project is anchored to an earlier professional experience. In this example the landowner, who is a retired legal professional, defends the legwork required for governmental buy-in for some projects. She anchors her disapproval with the Mountain Valley Pipeline by contrasting it with a project where the necessary permits and approvals were procured prior to construction.

If I'm an attorney and I'm working on something that is a project like this, let's say it's just a sewer pipeline. Before you ever get to this stage where you you're starting to build on it, you have to know that the government entities are going to work with you. It's perfectly logical. It's not evil or anything necessarily. So you start by going and having discussions with the county commissioners and the cities that you're running it through ahead of time to say, we would like to bring this sewer. This is the benefit the sewer's going to have for you. And I'm using that example ‘cause I did some work on a big wastewater line for [identifying information removed], including eminent domain work, I should add [laughs]. So you go to them and you talk about it with them and you get input from them and you may adjust where you're running your lines based on that input... Eventually what you want is buy-in. Unofficial buy-in on the project. Before you ever go public with it. Because you don’t want them up there saying, “We oppose this.”

Her knowledge is social in origin in the sense that the process of permitting is not a product of individual cognition, but rather a matter of the regular functioning of the judicial system. She is critical of the MVP project because she believes project management sidestepped the established norms of the permitting process. This is her opinion:

It goes back to a Supreme Court decision that came out in the redevelopment area. There was a federal Supreme Court decision that said you could use eminent domain for private projects. And I had thought even when I was in law school and studied that case, that it was a terrible precedent. And along with Citizens United, probably the two worst Supreme Court decisions ever. And this has firmed up my opinion of it. I think it's an absolute injustice and subversion of our Constitution and the role of government to allow

eminent domain for private gain. I think it's just wrong. And if it takes a constitutional amendment, if I were younger, I'd be pushing for that, frankly. Cuz I think it's so wrong, just absolutely wrong.

The interpretation of the pipeline is a social accomplishment. A country music fiddler from Roanoke County illustrated this by reference to a recollection from her family history, on a visit to her great aunt and great uncle down in a holler near Hazard, Kentucky:

You could hear the booms of the mountain top removal when we were visiting them. We had our first child with us when we were there. All the big trucks coming up and down the holler; it was just rape of the land, rape of the people. So yeah, I think that has kind of colored my thoughts as to why this is such an injustice here with this fossil fuel.

Unsurprisingly, she tied that anchoring experience into her pipeline opposition. The earlier assessment of valence by her extended family colored her later personal assessment of the pipeline. As Wagner and Hayes (2005: 119) write, “The person’s epistemic relationship to an object is defined and mediated by his or her relevant others”, whether a family of coal miners or a court of law. Family, neighbors, and occupation all tend to tether a novel event or object to a person’s common-sense understanding of similar phenomena. But the same social object may be interpreted in contrasting or even contradictory ways by members of different social groups. Moscovici’s theory, reviewed earlier, suggests that an individual is capable of simultaneously maintaining contradictory assessments of social objects and events through what he called cognitive polyphasia, leading to differences in evaluation.

Evaluation: Assessing the danger to persons and property

After a novel phenomenon has been individually interpreted by being anchored to prior experience, and then negotiated through communication with other members of a social group, it becomes a fabricated “social fact” that has a life of its own, an existence that is independent of

similar phenomena, and it is essentially independent of individual attitudes or opinions (Wagner and Hayes 2005:121). It is no longer just “like” something from the past, but has an existence in the present. Since it operates in a social milieu, it nevertheless remains iterative and ongoing.

Once people become aware of a novel object, and then interpret or explain it in light of their previous experience, they then evaluate or assess the social representation of that object or event in terms of its impact on themselves, their families, and wider communities. The object is, to the individual and to other social categories, familiar and normalized. There is then a common-sense meaning associated with the way people in a shared social space represent the pipeline or pipeline project.

The analysis of survey data indicated a statistically significant association between attitude toward the pipeline and physical/geographic distance from the pipeline. So in the interviews I asked the owners of property in the blast zone how they assessed any potential danger to either themselves or their property. I was particularly interested to see whether the valence (positive, negative, or neutral) that property owners assigned to the pipeline, carried forward from their earlier life experiences, would then carry forward into their assessment of two factors that are associated with residence in the blast zone: danger and disruption to their sense of place.

Since everyone I interviewed owned property in the blast zone, I expected that people would be more concerned about safety there than in the pipeline counties taken together. As Figure 6 illustrates with data from the survey, a lesser proportion of landowners in the blast zone feel very safe compared to all respondents in the pipeline counties, so that is not an unrealistic expectation.



Figure 6. Perception of safety associated with the MVP

However, my interviews revealed that perceptions of safety are complicated by many factors that I did not anticipate. I structured the interview protocol with the expectation that, in the blast zone, people would answer questions about safety with their perceptions of the potential for physical harm to themselves or their families. As these quotes illustrate, that was indeed the case for many property owners. Some property owners specifically mention their proximity to the pipeline:

People were saying on social media, well, what's wrong with these people that they can't stand a pipeline in their area? There's pipelines everywhere. And then we would have to say, well, those pipelines are eight inches, six inches. This one's 42 inches, under pressure, 1400 pounds per square inch, and I contend that it's dangerous. Cause if it would blow, we're within 150 feet of it and I fear for our safety. So that's been at the bottom of my mind ever since this came through. (graphic artist, Franklin County, Virginia)

I mean, absolutely I'll be gone if something happens. I won't know about it. That's the beauty of it., I mean, part of me says what a great place to die. If I was half a mile down the road, I might be burned to death. But here I'll just die. So I, you know, it's kind of

like, okay, I won't even know it it'll be so sudden... but then part of me says, that's not the way I want to die. (retired public administrator, Roanoke County, Virginia)

We would all be trapped. We can't get out. There's one road. There's no escape route. And they talk about, well, it's just the people around where it might explode. No, it could go two miles down that way, or two miles that way, and stop us from getting out. (beekeeper, Monroe County, West Virginia)

We'd be gone because we're so close. And to me, they've already proved what just blasting down in the field can do to our house and shaking it. So I can't, and that's just blasting. I can't imagine if it blew, unless if we weren't here, I don't think we'd know it. The whole house would just disintegrate [claps]. I mean, we would be gone. (property owner, Franklin County, Virginia)

There's another aspect here. And that's a fear factor. We have neighbors who have grandkids and if the pipeline is coming through, they're in the blast zone. Okay. They're also on a fault where the mountain plate (I don't know what you call it) dives under the Mount Tabor sinkhole planes, and the pipeline crosses it twice within the blast zone. So here's a prime example of a place that is at risk of having an accident. If any place is going to, it's going to be there. So here, you have people who, if there was gas running in there, they would think twice about having their families and stuff come to their property. (retired veterinarian, Montgomery County, Virginia)

Some people whose property is in the blast zone take a more probabilistic approach to the danger of explosion.

It's what I've learned about the pipeline and the gas itself and how it's constructed. I read some on it, I read a lot on it. And I think people that look at it at, if you look at it sensibly without a fear of what people tell you can happen, versus what could, I mean, what might happen versus what will happen? I don't think there's a problem. (retired farmer, Franklin County Virginia)

One landowner's risk analysis factors in her age, with a calculation of the probability of an accident during the remaining years of her life:

I would say, okay, at [her age], I'm willing to accept the risk that I'm gonna be blown up because it's gonna have some benefit to other people around me as a cost benefit analysis. Because it's theoretical enough that [laughs], I can live with it. I'll probably be dead before the explosion actually happens anyway. (retired legal professional, Greenbrier County, West Virginia)

We know there's earthquakes. We know there's thin metal. We know it's improperly installed. We know it's going to blow up. A rational person would think the deck is so

stacked against it being safe. There's just no way they could do it safely. (retired pilot, Monroe County, West Virginia)

Some property owners questioned estimates of the low probability of an explosion, because a natural gas transmission line had not been built under similar conditions:

Well, what can you say other than that they'll all be dead because if the pipeline blows up, the safety valves are 15 miles apart. And it's all in inaccessible territory. On roads that are inaccessible. And those issues in the scoping meetings and the meetings for the environmental review that they were required to have, those points were all made by people at the meeting and were just ignored and not really addressed in the final report. (retired legal professional, Greenbrier County, West Virginia)

This same landowner combined the difficulty of the terrain with her perception of the pipeline contractor's experience:

Nobody's trained in this pipeline. It's in territory that has not had pipelines put in before, because it's so steep and it's a very large diameter pipeline. If you assume that they continue to run gas through that pipeline, I would say that over the course of 25 years, there will be close to a hundred percent probability that there will be an explosion somewhere.

The valence of these evaluations of danger thus far have been negative. There were, however, other evaluations that had a positive valence. Most of the time, although it is not necessarily so, these positive evaluations were associated with support for the pipeline project. The following is an extensive quote by a pipeline supporter who is a retired dairy farmer and volunteer fireman with Hazmat training, from Franklin County, Virginia. It illustrates how the same social object can be interpreted with a wide range of criteria.

It's what I know about the pipeline myself and the way the pipe is constructed, the way it's buried, the likelihood of something going wrong from what I've seen, what I've studied, and with the amount of pipelines that's running all over the United States, it doesn't bother me being down here. I mean, because most of the pipelines that have had bad problems, somebody has damaged them in some way. I mean, from what I understand, there's not many that have failed because of the pipe or the weldings themselves.

Personally, I know enough about it, that it could be running 3 or 400 feet from my house and I wouldn't worry about it. What is buried under Roanoke city's streets? What do they

think this yellow pipe is that's going down the edge of the street and run into their house that heats them in the winter? They're living in a house that potentially could explode. I don't trust that gas line going down Roanoke city streets, as much as I trust this thing. You actually have more houses exploding nationwide than you do pipelines.

In high school, I learned to weld, and I was good, but not like these guys, these guys, they're welding from what I've learned and talked to them. They're what they call master welders. Most of them they've gone to school for years to perfect what they do. And then, I was told, they x-ray their welds supposedly. And if he's got three bad welds, he's gone and with the money they're making, they're expected to make perfect welds. So. And then too, they do an initial weld and then a robot welds the rest of it. [S: Really?] Yeah. They had big tents or little houses that they would move that had robots in them. And he would do an initial welding and then the robot would come along and weld over it. And then they x-rayed both welds, all of them. So that was my understanding. [S: And then they pressure test it?] They will. My understanding is they will pressure test it with water to twice the working pressure of the gas that will actually be in it. I mean, I know there's a chance it explode. Yes. Maybe less than 5% in my opinion. So I'm not concerned with it.

His view of the pipeline's danger was minimized by his hazardous gas training, and also by his experience as a dairy farmer.

Around the farm there's a danger in everything you do on the farm. Practically. I mean, a cow can hurt you. A cow can kill you. Tractors can hurt you; machinery can kill or hurt you. I had a cousin who was killed on a tractor, on a rollover, but he was watching the edge of a mobile machine next to a bank. He was watching his fence post. He was more concerned about the fence post than he was the creek bank. And it flipped over the creek.

Another evaluation that minimized the potential for an explosion was also coupled with support for the pipeline project. It came from a commercial dairy operator in Pittsylvania County, Virginia. He recalled a pipeline that had exploded in a nearby county about 70 years ago, and another at Appomattox, Virginia in the last 20 years. So his support for the pipeline centered around his opinion that a pipeline is safer than alternative modes of transmission.

When you think about, if those trucks were riding up and down [Route] 29 or [Interstate] 81, I mean, if those accidents would have happened for that same volume of gas that'd been transported, isn't it far safer to run that gas through a pipeline than it is on a tractor trailer truck comin' down the highway.

Strategies for mitigating the risk associated with the potential for disaster did not always associate with support for the pipeline project. For example, here is a statement by a landowner in Greenbrier County, West Virginia:

You can control risk. If you're a farmer, you don't wear solid metal rings because they get hung up in equipment and you lose your arm in the baler when you're up there trying to fix the baling machine. So yes, there are risks, but most people accept those risks as a price of the occupation and do what they can to avoid those risks, or they're shortly out of the gene pool. Bottom line.

This is a pipeline opponent who understands risk, but believes MVP has not minimized the potential for harm to the human or natural environment. This further complicates easy associations between risk aversion and pipeline opposition.

Landowners' evaluations are both personal narratives and social constructions, which is to say that to some degree they are fabrications that are the result of an effort to normalize something that is unusual, based on associations with similar events in their work or family life. The representation of the pipeline project may be similar among those who share a common social space, but as is evident, that representation is by no means shared across all social groups or categories.

The interview protocol asked questions about property owners' perceptions of danger. My assumption was that the danger posed by the potential for explosion would be residents' primary concern. It quickly became apparent that my assumption was incorrect for many landowners. People's assessment of danger often indicated less concern for their personal safety and more concern for the potential and actual harm to *water resources*. These concerns became evident early in the interviews, and continued to be at least as much of an issue as was concern for the potential for harm by a pipeline explosion. The survey question associated with Figure 5 asked the question, "Overall, how safe do you feel from any risks associated with the Mountain

Valley Pipeline?” It seemed like a reasonable assumption that safety, particularly for a landowner with property in the blast zone, would infer the danger of being killed in a pipeline explosion. This is an example of the benefit of mixed methods research, in that it drills down into just what property owners consider issues of safety, rather than relying on the researcher’s assumptions. Again, I did not anticipate this prior to interviewing landowners with property in the blast zone. Landowners’ concerns about water are listed in Appendix D. Sixteen of the 25 property owners I interviewed expressed one or more concern for the effects that the pipeline itself or the pipeline project would have on water. One other property owner said that MVP tested his water, and it showed no contamination, so he had no concerns with water. The following seem to be property owners’ main concerns:

- contamination of domestic water supply, to wells, springs, municipal water supplies
- contamination of natural waters: creeks and rivers
- contamination to farm water supply: farm ponds, water for farm animals, crops
- disruption of reliable water supply in wells, springs, or streams, through karst topography

The following quotes indicate this range of concerns about the potential for harm to water resources.

For me, my personal safety, yeah. I don’t worry about it... Ticks worry me more than anything else... When I grew up, like out in the country, when I thought about things like danger, I thought about like gun safety and I wasn't ever afraid of anything in the woods, particularly, but then with some farming you know, there are certain kinds of dangers that we learned about, when you're living on a farm that you don't, if you live in the town, it's different... But the water does worry me because like I said, we get spring water, and our source is uphill. And it serves five households. (retired librarian, Giles County, Virginia)

They could say they're taking all sorts of precautions, but especially crossing waterways. I think that's the most offensive thing about it that they think that it's safe to cross the Greenbrier River. For instance. I mean I don't know if you've ever seen the Greenbrier at flood stage, but to me, I can't fathom how government agencies could have said oh yeah,

that's okay, it's completely safe for them to cross the Greenbrier River with a pipeline. (farm landowner in Monroe County, West Virginia)

We have a creek, well and the pond and it's also karst topography here. So anything that gets into the surface water goes down very quickly into the groundwater and mixes and yeah... I've done a lot of work with water quality and I'm a toxicologist, so I'm interested in what toxins can be carried in the water. So because of that, I'm probably more aware of the potential danger from the pipeline and just living in a karst area. (toxicologist, farmer, Giles County, Virginia)

I had a beautiful creek that came running down off of the mountain through my backyard. It ran four seasons, winter, spring, summer, fall. I had a beautiful creek that ran through my backyard. Today it's a drainage ditch. Over a hundred years, this creek has been running through this piece of property. The day that they put that pipeline in the creek stops... They ruined my well. Guess what they did? Nothing. And it's even in my contract (hospital administrator, Franklin County, Virginia)

They didn't know what they were doing. They would always use the term mediate, meaning we'll figure it out as we get into an issue. And that just doesn't cut it when you're talking about people's lives and their drinking water and their air. (beekeeper, Monroe County, West Virginia)

Yeah. And you know, they've gone up Poor Mountain, but they haven't really done anything up through there. And up on the top, when they went down there 11 feet, they were in the aquifer, [laughs] and everybody up there on that hill, they rely on that for their water supply. (retired agriculture professor, Montgomery County, Virginia)

And the majority of the residents that live on this mountain that we know are concerned about the water. And the reason this [laughs] mountain used to be littered with stills is because there were so many springs that came out. It was a water source for them. And the old-timers, I'm sure there's still some stills up there somewhere, say that you could tell when the temperature was right. They looked like these clouds of smoke coming up, but it was the condensation off the stills... So there's a huge spring and it comes out actually kind of down over this next mountain over here, it's called Little Mountain. We're between Peter's Mountain and Little Mountain. And there was a huge spring over there and they, for years bottled that water. So this whole area is just known for its springs.

(retired landowner, Monroe County, West Virginia)

Danger, then, includes not only people's evaluation of the potential for physical harm to themselves, but also the potential for harm to water resources. The point of including these latter quotes is not just to illustrate the variety of concerns regarding potential damage to landowners' water, but also to argue for the value of qualitative inquiry and its ability to gain a more nuanced understanding of landowners' concerns.

Evaluation: Disruptions to people's sense of place

Landowners' evaluation of the *danger* they faced by living so close to the blast zone caused a change in my understanding, from an emphasis primarily on physical danger due to a pipeline explosion to an at least equal emphasis on the endangerment of water resources: for domestic and municipal use, as well as for agriculture. My inquiry into the pipeline project's potential for *disruption to property owners' sense of place* resulted in a similar revelation about its importance. I had expected that danger would be top of mind for people living so close to a hazard with so much potential for harm. I did not expect the range of emotional response generated by the pipeline project, starting with property owners' first encounter and extending all the way to their prediction of its impact on them and their descendants in the future. My comments in this section are brief. I rely instead on the sincerity and eloquence of those I interviewed. I refer to residents as property owners or landowners, but acknowledge that no matter how long they have been on the land, other people have even earlier ties and claims.

The theme of disruption to sense of place resulted in three subthemes that are tied to the previously discussed literature:

- on the land and of the land; deep cultural rootedness; *place dependence*
- eminent domain: a disruption to *place attachment*
- generations of ties to the land: *place identity*

These subthemes are organized around three concepts that are central to sense of place literature. Theorists in this area recognize that there is considerable overlap between place dependence, place attachment, and place identity.

On the land and of the land: place dependence:

Place dependence, particularly in the context of this pipeline project, is characterized by how people use the land to fill their physical and spiritual needs. The following quotes exemplify some of the ways landowners evaluate their dependence on the land.

My father said that you know, when the stock market crashed, apparently his father had a good job and had just bought a brand new snazzy car that he was very proud of, 'cuz he'd come back from the [First World] war too. He was a veteran and he lost his job and he had two or three kids already and he traded his brand new car that he'd only had a couple of months for a piece of land and sack of potatoes [laughs]. And then he moved his family out of town up on the Swell Mountain [Raleigh County, West Virginia] above Hinton. And that's where my father was raised. And again, he said they never went hungry. You know, they were a large family and they raised everything they ate. And he said, if they'd stayed in town that would've been a much different story. Sure. So I guess he planted those seeds that it's important to hold on to land. We lived off the land when I was growing up. My parents didn't buy a lot. It's more of an insurance policy now, where it was a way of life growing up. (farm owner, Monroe County, West Virginia)

I always think of neighbors as people who I could walk to their house if I had to... Mostly I can count on anybody up here to come, even if they're for the pipeline, because that's what this community is all about. I mean, I could get on the phone and call any household, you can just pick a number. It starts at 929, and dial a number. I could probably talk somebody in coming and helping me. [S: Yeah. Cause that's valuable.] It's extremely valuable. That's why I moved here. This is a very unique community. (retired public administrator, Roanoke County)

[My spouse] and I have grown up with a background of the land... And so there's always this link to the land. And I was the same way. Grandparents, parents had farms... I like wild game. We eat it. It is healthy for you the way we like it... And so, you know, I shoot a deer or two. And we have dogs... So we have dogs that hunt, and every day, three times a day, the dogs go on a walk. If they run a rabbit, they tree a squirrel. Yesterday they treed a groundhog, a squirrel, and they ran a rabbit, all in one trip. And so it is a mental thing for us besides this is where we live. (retired veterinarian, Montgomery County)

Eminent domain: a disruption to *place attachment*

Recall from an earlier discussion how 11 siblings were able to protect their beloved homestead when the matriarch of the family became infirm. That story yields insight into both a rural approach to conservatism and also a family's attachment to place. Here are other quotes that suggest the importance of place attachment for landowners along the pipeline.

We have 86 acres. Most of it is side of the mountain, which is fine with me. And settled in happily only to discover that everything we wanted in our retirement was going to be destroyed by this project. And it was particularly distressing to me because the area that they were gonna run the pipeline through was along the ridge line, which is where all of our old growth trees were because it wasn't accessible for timbering. And I really place a high value on those trees. They were important to me as part of the forest and part of the natural succession of the forest, undisturbed by man... [The soil] is highly erodable, and the old growth timber, the root system of the trees is really important in keeping the soil where it was. (retired legal professional, Greenbrier County, West Virginia)

A retired textile mill project manager from Franklin County, Virginia said that even though his job required that he move around, he kept the family's land: "It's been in my family for as far back as we can document the family tree: four or five generations. It was once over a hundred acres there... I intend to pass it on to my boys." His attachment to the land is expressed through inheritance. Others express place attachment through their duty to be good stewards of the land.

Here's this place. It's almost like I want to defend it... Not that I could defend against this massive pipeline pushing gas through here... It's almost like, I know I can't protect the natural world. It more protects me. But I can't leave this place to their devices. I just can't. That's why I'm going to stay here and do what I can to keep it from getting as harmed to the level that they will harm it... I had been all over this mountain, all through these ridges, all along this waterway through the wetlands. I feel very strongly connected to this. This is my solace. I mean, I'm not the kind of person who has to always be going somewhere. I want to stay here. I mean, I have friends. I'm social. But to be able to go out there and sit and just watch the lightning dance across the sky, the little creek you crossed over, coming up our driveway, I've got a little chair just to go down there and sit. And, you know, frogs will come and be sitting beside me, the deer. Even eating our garden, I like the deer. (country music musician, Roanoke County)

This is a solace for me. This is after living in a big city and driving down a 12 lane, super highway every day, going to work. I just wanted to retire in peace and quiet. And that's what this land means to me. I love this. I don't have to see another house. I don't have to see another car. And I don't have to see another person unless they're neighbors and drop in just to say hi, which is fine. (retired landowner, Monroe County, West Virginia)

I had probably at least at least a hundred year old Pippin apple tree, big ol' apple tree, that's just that pile of wood you see over there in the corner of the property, that they cut down. And that was the key point on this property. All the deer loved to eat the apples, all the deer had babies under the apple tree. This whole field used to be a Pippin apple orchard. But that was the one that was left there in the corner. And they just cut it down. And I, I cried that day, I literally cried when I saw my apple tree come down. And it's

been down; they haven't done anything with it. I mean, they just left it In a pile. I think it's covering up something. I can't understand why they just left it there unless they're covering... I think, well, I think it's covering up a wetland, so I think they hit a spring... I think they left it there because it's covering the spring and they didn't want the DEQ to see that there's a spring there. (retired public administrator, Roanoke County, Virginia)

I asked a property owner with a long history of ties to Monroe County, West Virginia what makes local people feel so attached to their land. He said, “that also comes somewhat out of the coal fields, from the robbing of the Appalachia area where people could live in a little hut and have a 50 by 50 lot for a garden, but they couldn't own anything. And there was no other place, you know, like the country store and all that. There's a lot of that still hanging over after five generations.”

I sought to improve the validity of the qualitative finding of strong attachment to place by circling back to the survey and questioning whether attachment seems stronger among residents with property in the blast zone. The result is in Table 15.

Table. 15 Attachment to County of Primary Residence and Blast/Control, % within zone within county, Heat Map

		<u>Blast</u>	<u>zone</u>			<u>Control</u>	<u>zone</u>	
	Very	Somewhat	Slightly	Not at all	Very	Somewhat	Slightly	Not at all
	attached	attached	attached	attached	attached	attached	attached	attached
VA COUNTY								
Giles	0.11	0.03	0.01	0.00	0.05	0.02	0.00	0.00
Montgomery	0.05	0.03	0.01	0.00	0.09	0.04	0.01	0.00
Franklin	0.23	0.11	0.02	0.00	0.19	0.07	0.02	0.00
Craig	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
Roanoke	0.04	0.01	0.00	0.00	0.01	0.02	0.01	0.00
Pittsylvania	0.07	0.03	0.00	0.00	0.16	0.05	0.01	0.00
SUBTOTAL %	0.50	0.21	0.05	0.01	0.51	0.20	0.05	0.01
WV COUNTY								
Monroe	0.07	0.01	0.00	0.00	0.10	0.01	0.00	0.01
Greenbrier	0.04	0.01	0.01	0.00	0.05	0.01	0.01	0.00
Summers	0.04	0.01	0.01	0.00	0.03	0.01	0.01	0.00
Fayette	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SUBTOTAL %	0.16	0.03	0.02	0.00	0.18	0.03	0.01	0.01
TOTAL RES	282	105	33	7	242	81	21	6
N=777. 6 null cases were excluded.				Darker color gradient indicated greater attachment				

This heat map suggests first of all that residents are quite attached to their properties. A darker color gradient indicates greater attachment. The control group shows attachment that is similar to the blast zone group, which is to say that being in the blast zone does not seem to increase attachment. Also, the residents of Franklin and Monroe counties display relatively higher attachment for some reason.

Generations of ties to the land: *place identity*:

Many of today's landowners declared that their generational ties to the land have been disrupted by the pipeline project. Family ties bind generations of rural people to the land, no less so in Appalachia than elsewhere.

My grandmother lived here and it's always been a very important, very valuable part of my life. It's why I moved here. I was living in Newport News and she'd passed away and my dad said, do you want to buy the place? And I thought about it a while and thought

about the rush hour traffic to and from the ship yard every day, and I was like, “Yeah.” (retired electrical engineer, Pittsylvania County, Virginia)

A researcher from Giles County, Virginia mentioned Newport News in another context, which threatened the identity of the historic village of Newport, Virginia:

I don't know how long you've been in the area, but Newport News would love to change its name to just plain Newport. And they can't because our little town, Newport here has been around longer with that name. And they, so a big city who wants to change the name can't because of our little local Newport, our historic district, that's been around for a couple of hundred years. That tells you how important that is.

Place identity is often tied into discussions of ancestry and descendants. Place is social. I recall one interview with a farm owner in Monroe County, West Virginia that was interrupted when my collaborator met her new mail carrier. Within five minutes she knew exactly where he lived, although miles away, who his neighbors were, and how she was related to them. This was a real-time example of how the “genealogical landscape” (Allen 1990) situates kin-based social networks onto physical geography. Kinship is the glue that holds society together, and land binds it up like the cover of a book.

It's not just what the property was for us, but what it could be for our children and grandchildren after us. And there are just fewer and fewer places in the world where you have the kind of just untouched nature that we had there. And then to realize that a pipeline could just come through it without our permission, we would have no say in it, was really kind of devastating... The people are so poor here, the poverty level's so high that they don't have much to give their children. And their land is the one thing I think that they feel like “we can pass that down to our family.” (mental health care professional, Monroe County, West Virginia)

Now for some people you'd say, well, why don't you just sell your property and leave? Okay? If you look on the Franklin County map, dating back to the 1600s, you'll find the [identifying information suppressed] name on the map. It was land granted from England to my husband's family. Right? It's not like we've just been there a little while. Okay. This is family land that dates back generations. (hospital administrator, Franklin County, Virginia)

God gives you things that you are a manager of while you're on this earth and you're entrusted to use them wisely. And then it's gonna move on to another generation or other people. I mean, it's the same way if you're talking about the earth. A lot of people talk about that in the same way with the earth, we need to keep this planet going for the next

generation. Well, I see that, but also the land or resources or assets, anything like that, that while I'm here, I've been entrusted, what am I gonna do with it? It's not really mine, but how can I give it to people or how can I generate revenue from it to give to people... Yeah. It is an asset, but it's more than that. And I think a lot of people down here kind of feel that way. There's this strong emotional attachment to it. (business development consultant, Pittsylvania County, Virginia)

They cleaned by hand with axes and mowing scythes and stuff like that. My grandfather did this and he did well, my father did this and he did well, I don't want a damn pipeline going through it and can understand that. And it would've been a little different too if the pipeline people were absolutely honest, but in many cases, they were just blatantly liars. (historic property developer, Monroe County, West Virginia)

The sentiment of the following quote, from a multi-generational landowner in Franklin County, Virginia, may be similar to what much earlier inhabitants of her property, the Monacan and earlier people, felt when forced out of their home place:

I think as a whole like I'll say with myself and some of the other neighbors that direction, we've kind of said, you know, there is nothing that we can do to stop them. They're going to, they're going to put the pipeline through, there's nothing we can say or do that's going to make that any different. So to us, we're just forced to be where we are. Now again, for myself and my husband, you know, we love this land. We have 18 acres here. We love this land. We love the trees. [gets emotional] We love... my son hunts, you know he's got game cameras, there's bear up in here. You know, there's, you know, this is, this is what's belonged to our family for so many years. We don't want to be forced out just because some pipeline comes through and they want what they want.

The order of presentation of these results is intended to mirror the process by which a landowner becomes *aware* of the pipeline as a novel object and the pipeline project as a novel event, and then *interprets* it by anchoring it to personal history or work experience. That interpretation is then *evaluated*, and a valence added, illustrated by how they assess such factors as danger and disruption to their sense of place. Finally, that evaluation is available in the formation of a social *response*: support, opposition, quiescence, acquiescence, or indifference to a representation that is shared among members of a social group or category. This chapter concludes with examples that briefly trace this process.

Support: Ties to the economy and ideology

I interviewed the owner and operator of a large commercial dairy. His supportive response to the pipeline might easily have been predicted by his description of his prior experience with similar events. He recalled an explosion of another local pipeline, about 70 years ago, and another about 20 years ago. He interpreted this recollection by arguing for the relative safety and economy of fuel transmission by pipeline, compared to transmission by truck or train. He also recalls the more recent backlash against solar farms in Delaware, fueled by concerns that those farms took valuable, scarce cropland out of production. His free-market ideology, in which he argued that “availability drives the market”, led him to a negative evaluation of solar energy production. By contrast, he evaluated the pipeline with a positive valence. His response to the slowdown of pipeline construction by environmental lawsuits was to say that it is a disgrace that permits were granted, but then construction was stalled, because the partially finished project ties up productive farm land. He says that 90% of people are for the pipeline. This is a claim that the local farming community is a “site of acceptance,” with support for free-market ideology and minimum interference (regulation) by government. He says his son has a dairy about two miles from the existing compressor station, with no problems, and offers this as evidence that pipeline opponents engage in unfounded scare tactics. See Table 12 for a challenge to this resident’s claim that his county is a site of acceptance.

Support: Ties to the social representation of danger and disruption

I interviewed a retired dairy farmer and volunteer fire and rescue person with hazmat training. Other than through the media, he said his introduction to the pipeline was through a woman who came through the neighborhood with a message that they were in the blast zone. He interpreted that encounter by contrasting the danger of the pipeline with the danger he had

experienced with an accident involving a tractor trailer full of gas. He then evaluated the pipeline to be considerably less dangerous than the incident from his own experience. Furthermore, his response to the disruption of the pipeline was to say that he and his next-door neighbor just wanted the pipeline done, recognizing that “you’re not going to win, so I wouldn’t have fought it anyway.

Opposition: Ties to recreancy and activism

I interviewed a retired public administrator. She first became aware that the pipeline would be coming through her land when the route shifted from the neighboring county to her county, and then right onto her property when MVP sidestepped adjacent property owned by the Blue Ridge Land Conservancy. Her interpretation of this novel project was anchored in her recollection of similar nearby projects involving wind turbines and an interstate highway project. But her interpretation was also influenced by the contrast she saw between the way she felt about the government from her earlier life and the distrust she now has for it. She said, “I used to be a pro-government person. I worked for the state of Virginia. I’m a public administrator by trade.” Her evaluation of the pipeline project, based on similar cases where the public had little input, was that “pipelines pretty much have carte blanche to do anything they want to in this country. FERC has “only denied one pipeline they only denied one pipeline. That speaks to me of a lobby, an industry that basically has total control over the people that are supposedly controlling them. And that's just not politics as it should be, in my opinion.” Her evaluation of the pipeline project is based on her interpretation of activity by government she once respected and has come to distrust. However, she is hopeful and engaged with pipeline opposition, because with the interstate project, “the community fought back on that one” and prevailed in having it moved. Through her connections with local activists, she has concluded that “these people do not play

nice... Do not go down and approach them. They will have you arrested. Don't speak to them; keep your mouth shut. Don't say a word to 'em. Just growl at 'em [laughs].

Opposition: Ties to danger and disruption

I interviewed a person with a legal background. Her introduction to the pipeline was through a public informational session. It piqued her interest because she had grown up on a farm, "with a very strong attachment to the woods and forest," and was alarmed that her sanctuary was being invaded. Her interactions with pipeline representatives led her to interpret the pipeline project through her legal experience with similar events. She was particularly unsettled by the harm to the old-growth forest on their property and to the disruption to her peace and quiet. Her complex and nuanced evaluation of the project included these selected comments: "Everything that company says is either misinformation or an outright lie. And they are the most arrogant group of people I have ever dealt with, with absolute contempt for the people whose property they are going to run the pipeline over." She contrasted her opposition to the pipeline with her critique of people who either thought the pipeline would bring jobs or "assume they have no power over these corporations." Her response was to declare, "I still believe in the legal system and I believe that there's power and that people have the right to have some control over their lives." Despite a gently critical evaluation of political, cultural, and religious reasons for the submissiveness and lack of opposition by local landowners, which I would characterize as quiescence, she says, "I firmly believe that an independent judiciary is the last bulwark between freedom and oppression." Her approach to danger is couched in terms of what she can and cannot control. Her understanding is that "the rule of law comes down to protecting property," which she says is the basis of criminal law, whether against one's personal property or against one's body. Her reading of eminent domain law is that it can be justified, but only when it serves

a truly public purpose. So her oppositional response to the pipeline project is predictable, given the process by which she became aware of the pipeline project, her interpretation that anchored it to similar events in her legal background, her valenced interpretation of its injustice, and her subsequent opposition.

Acquiescence and indifference

I interviewed a retired banker and park maintenance supervisor in Summers County, West Virginia. He is the absentee owner of a small piece of property for which he got what he described as an outsized payment for granting an easement. He became aware of the pipeline project through a letter from MVP. His neighbor across the street had “big billboards” up, but he has not talked to anyone about the project and considers any potential risk to be low. I was particularly interested in how his occupational connection to the channels of power might turn any perception of inequity in MVP’s treatment of property owners into a non-issue, in Gaventa’s (1982) terms. He indeed interpreted the pipeline through the lens of life in business. For him, it is informed by his dealings with federal banking regulators. He said, “Nothing you do with the federal government is easy.” He did not attend any informational meetings, because “of course they’re during the week when everybody’s working so do I go to work or do I go there and not get paid?” He says, “I guess I have to trust the contractors... that they do their job,” and is indifferent about regional, national, or global impacts of the pipeline. He has not expressed an opinion about the pipeline, because “that was not a concern of mine,” and anyway, the last time he talked to one of the pipeline people, about a year ago, the guy said they were about 96% complete. His evaluation is not completely indifferent, but more acquiescent, in the sense of passive acceptance. He says, “Well, my opinion was I really couldn’t fight it, that I had to find a way to go along with it.” Despite his lack of concern for any adverse impacts of the pipeline, he

appreciated what he described as the quiet beauty of his property, with a view of the Greenbrier River. His response to how he represented the pipeline after having evaluated it in terms of his earlier life experiences was, “For the average person, you couldn’t argue against the pipeline in the courts. So you have to negotiate whatever you can before you go. So they certainly have you somewhat over a barrel.” If you do fight it, “you have to go to federal court that can be three hours away from the house and have to pay for an attorney. A lot of people in West Virginia don’t have a whole lot of expendable income. So they’re sort of screwed on this one.” But he perceived that he was not.

Landowners I interviewed consistently represented the pipeline project by anchoring it to objects or events in their earlier life. Once they had established a concrete interpretation of it as a thing in itself, like but not the same as other similar phenomena, they evaluated it, and often attributed a valence to it, even when those evaluations were simultaneously both positive and negative. Their evaluation was then available as a basis for either active opposition, perhaps as a “pipeline fighter,” or as a supporter of the project, perhaps out of economic self-interest or out of agreement with the assumptions of neoliberal political ideology. There was no evidence for any organized mobilization among property owners who supported the project. Among the 25 people I interviewed, there were some who were indifferent, exhibiting a “why bother if it has no effect on me?” attitude, long recognized by political theorists (Downs 1957), and a fair number of property owners who sometimes painfully described their quiescence, declaring that “there’s nothing we can do,” particularly in the face of a powerful opponent. I recognized few cases of acquiescence, or passive acceptance, perhaps because of some specific characteristics that differentiate this energy transmission project from energy production projects. I will argue for that possibility in the discussion that follows. The theory-driven approach that I used for my

interviews, examining the process by which landowners derive their attitudes toward the pipeline project, sometimes corroborated and sometimes challenged both our survey data and other prior research.

V. Discussion and Conclusion

There are a number of recent studies in the theorization of environmental justice that consider the perspectives of those who support as well as those who oppose potentially hazardous energy infrastructure projects. One practical effect of interrogating such an alternative notion of environmental justice is that contending parties may find common cause for advancing inclusive and equitable solutions to pressing problems in energy production and transmission.

The first aim of this new research was to either corroborate or challenge prior research suggesting that an exposed population will either support or oppose a hazardous energy infrastructure project on the basis of economic self-interest, or perhaps their political ideology, or their physical distance from the project. The analysis of survey data for property owners in counties along the 303 mile route of the Mountain Valley Pipeline in southeastern West Virginia and southwestern Virginia indicated that economic self-interest had no significant association with landowners' attitudes toward the pipeline project, and attitudes were only minimally associated with landowners' political ideologies. Proximity to the pipeline, however, was significantly associated with attitude toward the project.

The second aim of this research was to fashion a sociological response to this largely physical geographic factor by asking how groups or social categories arrive at their attitudes toward such a contentious project. That investigation consisted of interviews structured to sequentially follow the process by which property owners with specific identities, often tied to their work or early family life, use their "common sense knowledge," the awareness that they share in common with others in their social spaces, to interpret, evaluate, and respond to the pipeline project, as a novel social object or event. The process is framed in the terminology and

conceptualization of social representation theory. If the mark of good theory is its capacity for generating evidence-based knowledge, I recommend it. Before I discuss these findings, I would like to briefly review the thinking that preceded it.

The civil rights and antiwar activism of the late 1950s and early '60s quickly spilled over into other issues of social justice, such as gay rights, women's rights, and the anti-nuclear movement. By Earth Day in 1970, activists had established organized opposition to industries (nuclear, coal, and gas mining, processing, and disposal, and the tobacco, pesticide and herbicide industries, among others) hazardous to humans and the natural environment. Scholars who studied activism for environmental justice, like other social movement theorists of the time, were particularly interested in the recruitment, mobilization, tactics and strategies of groups opposed to hazardous industries. That interest continues to this day. However, by the turn of the century, social movement scholars had clearly articulated a necessity for the inclusion of voices previously unrecognized in the literature. For some of those interested in industries that have an impact on the environment, that meant paying attention to not just those who oppose projects that have the potential for harm, but also those who support such projects. This study is founded on early work by John Gaventa and other theorists of social movements who revealed the complexity of factors that push or pull a social group or category into active support or opposition, or perhaps the passive resistance that he called quiescence, or the passive acceptance recently conceptualized as acquiescence. This study provides evidence that social representation theory can continue the qualification of earlier explanations of public attitudes toward contentious energy infrastructure projects, due to its capacity for organizing the complexities of the process by which an impacted public perceives and then responds to a novel source of environmental risk.

This research challenges claims made in the last decade or so that those who support industries with the potential for harm to humans and/or the natural environment generally justify their positions with arguments that reflect neoliberal norms and/or local socioeconomic contingencies. For example, Malin (2014) cites the case of citizens in two cash-strapped towns in southwestern Colorado that once had a thriving uranium mill. They welcome a proposal to reopen the mill, knowing well the tradeoff between financial security and risk to physical health. Local actors make similar economic arguments for other sites that generate the materials necessary for the production of energy, such as coal, oil, or natural gas. Does the draw of economic benefit, or adherence to conservative political ideology apply to all utility-scale energy infrastructure projects? This research uses in-depth interviews to gain insight into factors that may differentiate between sites of energy production and sites of energy transmission.

Survey data allowed comparison between property owners living within the 1,115 foot radius around the pipeline, the “blast zone,” and others living at least ten miles away, but in the same county. Interview data collected from twenty five owners of property within the blast zone allowed a closer look at concerns about danger and disruption to sense of place. This made sense, given the earlier finding that geographic distance from the pipeline is associated with property owners attitudes toward the project. The triangulation of data sources, including the fine-scale differentiations in exposure to an environmental hazard allowed by this robust data set, is designed to strengthen the validity and reliability of its findings. Those findings have implications for policymakers who represent citizens living along the more than 1,083,000 miles of energy transmission infrastructure in the United States, and for the natural environment that policymakers, governmental agencies and the public are entrusted to protect.

The first aim of this research used survey data to explore the influence of three factors: perceived economic self-interest, internalized neoliberal logics, and concern for spatial distance from the pipeline, to assess the extent to which previous studies based on sites of energy production also apply to this pipeline project, as a site of transmission. The objectives of this first aim were designed to either validate or challenge the literature by exploring the distinction between utility-scale energy production and energy transmission projects. Previous research led to an expectation that the prospect of jobs would form the basis for economic support for this pipeline. Prior research would also lead to an expectation that citizens who identify as conservatives would be more likely to support the pipeline than liberals. Research results relating physical distance from a potentially harmful environmental project are mixed, with both NIMBY and inverse NIMBY concerns, depending on a number of factors.

A. First aim: Corroborate or challenge existing research

First objective: Survey perspective

The first of three specific objectives associated with the first aim of this research was to determine if there is a statistically significant association between economic gain and attitude toward the project. Malin and others (Boudet et al. 2016; Jacquet 2012, Malin and DeMaster 2016; Malin et al. 2017; Mason et al. 2015) support an inverse “not-in-my-backyard” argument based on economic necessity. In other words, if there is an economic incentive, one expects significant support for the project. The null hypothesis predicted no statistically significant association between economic gain and attitude toward the project. The non-null hypothesis was not supported, and a Cramér’s V was .10, which is a small effect. So for these property owners, signing a lease, which was a proxy for economic gain, had no important effect on support or opposition to the pipeline project. A variable that reported change in a property owner’s quality

of life was considered a proxy for opposition. The proxies are imperfect placeholders for the variables of interest, but are in my judgement the closest approximations available in the survey instrument. So whereas prior research found that the prospect of economic gain drove people toward support for similar projects, the survey found no significant support. The interviews provide some explanation.

First objective: Interview perspective

There certainly were indications from some property owners that there was a tie between economic incentives, particularly from the sale of property or the granting of an easement, and attitude toward the project, but for other reasons as well, including the prospect of jobs, as in previous research. These are the words of a landowner in Pittsylvania County, Virginia: “I have been well pleased with my dealings with Mountain Valley, including the easement payment. I feel the pipeline is a plus for all citizens of this area.” This is precisely the association between community acceptance and perceived economic benefit noted for other energy infrastructure projects (Alcorn et al. 2017; Bugden et al. 2017; Jacquet 2015), particularly those involving unconventional oil and gas development (UOCD). Appalachian-located people have historically normalized what Bugden and associates (2017:62) describe as “legacies of natural resource extraction,” so it is no surprise that they might feel comfortable granting an easement to the pipeline developer. Generations of landowners in the region sold their timber and mineral rights. Recall the words of a farm owner in Monroe County, West Virginia: “I’ve heard that we’re the only state in the nation that ever had an office on Wall Street, encouraging people to come in and take advantage of us.”

One property owner in Franklin County, Virginia said that the pipeline project would have direct benefits to his county and also indirect benefits to himself because he believes the

(questionable) promise that there would be a gas tap into the industrial park: “When that's up and going, and we have natural gas in there... I don't think my property taxes will rise that much because we're going to have industry here that we'll have taxable base and the county's not going to hit the little man, the retired guy so hard.”

There were some property owners who accepted the project not for their own or their county's benefit, but for its benefit to corporate investors: “I guess they'll sell to the highest bidder. You know, business is business, and they'll take the dollar.” (small business owner, Greenbrier County, West Virginia). Others indicate a global economic basis for supporting the pipeline project, such as this insurance salesperson from Pittsylvania County, Virginia: “I think from an economic standpoint, anything that the United States can do to become energy independent, yeah, I think it's a good thing.” Although it is largely denied by the pipeline developer, many of those I interviewed suspected that much of MVP's natural gas would become liquified natural gas (LNG) and then shipped overseas. Subsequent to these interviews, the invasion of Ukraine by Russia in 2022 suggests geopolitical reasons for the pipeline project that might have further influenced support for the pipeline. The prospect of jobs, predicted in the FERC's Final Environmental Impact Statement, was noticeably minimal, consistent with Skinner and Sweeney's (2012) finding that in the case of the Keystone XL pipeline, pipeline promoters overstated the creation of jobs. Jobs in the unconventional oil and gas extraction industry (UOGE), which are located around a point source, tend to go to non-local workers (Wrenn et al. 2015). The economic benefits touted by pipeline authorities and written into the Final Environmental Impact Statement (FEIS) did, on the whole, not influence the opinions of property owners. That was reflected by both the quantitative result of no significant connection

between economic gain and attitude toward the pipeline, and property owners whose opinions are not swayed by actual or alleged economic benefit.

Despite reasons why property owners might support the pipeline, there were many more of those I interviewed (16 of 25) and many more of those who participated in the survey for whom any economic gain was insufficient to offset perceived costs. This observation should be qualified by the possibility that pipeline opponents were more motivated to respond to the survey and request for interview than those who support the pipeline project. Nevertheless, the lack of a statistically significant association between economic advantage and pipeline support requires explanation. Many interview respondents challenged arguments that the pipeline had important economic advantages. Their arguments ranged from the personal and familial, through those affecting their community, and extending to arguments that were regional and global.

A dairy farmer in Pittsylvania County, Virginia who is generally supportive of the pipeline complained that farmers cannot use their cropland because there is pipe on the ground, unburied for years. A landowner in Roanoke County, Virginia stated that her neighbors who settled (sold an easement) gave up more than just the control of their land: “Once they’ve settled, they’re under a gag order. That’s part of the agreement. They say they’re not allowed to talk, say anything for or against the pipeline.” Her neighbor, who has serious health problems and no financial security, decided to settle for an easement after the pipeline crew cut all the trees down on a wetland she had wanted to protect. “And she’s not seen a dime of the money.” Another kind of cost was incurred by another owner of property along the same stretch of the pipeline in Roanoke County. She was so stressed out with concern over the danger she associated with the pipeline that she bought another house that is at a safer distance.

Interviews revealed other costs property owners associated with pipeline opposition. A number of landowners challenged or considered challenging MVP's trespass on their property, or challenged MVP's right to eminent domain. Here is one example:

We were taken to court for peacefully witnessing the activities of the pipeline contractor. They never showed up because they knew they didn't have a case. So they never showed up. So we all had to go to court, hire lawyers, go into court, have the judge say, okay, since they didn't show up, I'm going to dismiss the charges contingent on, you keep your nose clean for a year, you have no more interactions with the pipeline people, and in a year, we'll expunge your record. And that's what they've done to everybody on this mountaintop. All of us have had a suit brought against us, which basically shackled us for a year. Now all of our years are up. So we're ready to take them on again. (retired public administrator, Roanoke County, VA)

The landowner considered the pipeline company's action to be harassment and intimidation, as well as an economic burden. Owners also claim a loss of property value. As noted in Chapter One, this claim is disputed by FERC staff, who wrote, "Multiple studies indicate that the presence of a natural gas pipeline would not significantly reduce property values." (FERC/FEIS 2017b:ES-11). One owner put it this way: "They keep telling me that my property values won't change. Really? Tell me that again, when I try to sell the property." Some people I interviewed don't question the legitimacy of the pipeline developer's use of eminent domain. However, one property owner on Bent Mountain in Roanoke County said, "If a private company wants to put a pipeline through here for their game, that's their right. But they should be paying people handsomely for that." One owner of forested property complained about another kind of economic loss: "There's nice timber and I could have cut it, for saw timber, and cut pulpwood out of it, but like I say I got a payment for it, and I was just trying to get loggers to take it to reap some more money out of it, but they couldn't get to it. And it's laid there now and rotted."

Property owners spoke of other costs with insufficient offsetting economic gain. These included increased homeowner's insurance, the public burden of remediation if/when the pipeline is no longer in use, the loss of property values anywhere in the blast zone if there is an explosion anywhere, the burden to gas company customers who must underwrite the guaranteed 14% return on investment for pipeline backers, and the society-wide economic cost of public policies that encourage investment in natural gas as a "bridge fuel" during the transition from fossil to renewable energy sources, rather than the immediate transition to renewables. Regionally there are also the historic economic and environmental costs associated with Appalachian extractive industries.

This extended discussion of property owners' perceptions suggests the range of economic reasons why property owners may support or oppose the pipeline project. Malin (2014:270) says in her case study, "Strong support creates a sociologically important site of acceptance of renewed uranium development, where alternative notions of EJ drive mobilization." So what explains the quantitative and qualitative evidence of an overall lack of economic support for the Mountain Valley Pipeline? I will use Malin's framework to structure an answer. The drive to reopen the uranium mine in her 2014 study was fueled by four themes: local identification with the industry, persistent poverty, economic insecurity, and a moral justification for nuclear power as an alternative to fossil fuels. The previous discussion identified instances in which residents chose to support the pipeline because of its perceived economic benefits. And FERC's Final Environmental Impact Statement similarly argued that the project would boost local economies. So then why did the analysis of survey data find no significant association between economic gain and attitude toward the project?

Malin argues that a "site of acceptance" is fueled by four themes. Regarding the first theme, there was no evidence from the interviews that there is *local identification with the industry*, and minimal overall support. This was evident by comments that the pipeline developers shared little concern for property owners regarding the path of the pipeline. According to a business consultant from Pittsylvania County, Virginia, "They don't care about property A, B, C, D, or E, or who owned it or whatnot. The primary driver of this is shareholder wealth." The actions of the pipeline company were often considered intrusive and inconsiderate. These are not perceptions that are conducive to local identification with the industry. Said the wife of a propane gas hauler in Franklin County about pipeline vehicles,

They'll run you off the road. They could care less whether they hit you or not. You know, if a wide truck's coming through with farm equipment on it, kind of get over to the edge if you can and let them by, you know. It's been a whole different world with the pipeline.

Furthermore, the owners of property in the blast zone see very little economic benefit that would lead to local identification with the industry. This is evidenced by the many residents who countered FERC's claim that the pipeline would create local jobs as they observe that license plates on pipeline trucks were always from out of state. According to a custom woodworker in Montgomery County, Virginia:

They come from all over. The tags on the trucks: Pennsylvania, West Virginia. So there's no Virginia tags. They're all out of state. So they're not providing any local economy. McDonald's might get a little money from lunch, but in the big scheme of things, they're not doing anything to help anybody.

In the unconventional oil and gas extraction industry (UOGE), jobs similarly tend to go to workers from outside of local communities (Wrenn et al. 2015). Reflecting on this statement, I am reminded of my work as an electrician in the steel mills along Carson Street on the south side of Pittsburgh. There were local restaurants: Polish, Italian, Ukrainian, that provided quick lunches for workers in the mills, in a close and mutually beneficial symbiotic relationship.

Property owners along the route of the pipeline expected no such relationships, either temporarily or permanently.

Malin's second and third theme, persistent poverty and economic insecurity, do not seem to be much of a concern except when less financially secure property owners are lured into selling an easement. But selling an easement did not generate support for the project. Many residents along the pipeline route are farmers or are retired. Their land, their savings, and their pensions give them no reason to rely on the fleeting presence of the pipeline developer to offset poverty or economic insecurity. Arguments for the creation of jobs, so important to the arguments of Gravelle and Lachapelle (2015) and others, fell on deaf ears, as local people saw license plates from states other than Virginia or West Virginia. People similarly recognized that the pipeline would create few permanent jobs. This is an important distinction between a point-source, such as is found in energy production facilities, such as mines, mills, or powerhouses, and energy transmission projects like the pipeline. Malin's fourth theme, moral support for the pipeline on the basis of natural gas as a substitute for some other energy source, makes little sense other than the weak argument that it is a bridge between fossil and renewable energy sources.

Malin argues (2014:270) that sites of acceptance represent "ways in which people conceptualize EJ differently across spaces and places." Extending this thought, I think it is worthwhile to distinguish between utility-scale sites of energy *production* (mines, gas and oil fields, processing mills and refineries) and utility-scale sites of energy *transmission* (the electric grid, oil and gas pipelines). Sites of energy production are *point-sources* of pollution, a fact well known to environmental justice scholars. But these sites of energy production also provide jobs and a tax base for local economies, which are sources of local identity with the industry. Because

of this, a site of energy production is likely to generate local support, which is in Malin's terminology a "site of acceptance." A site of energy transmission, by contrast, is less likely to provide jobs for local workers, add little to the tax base, and generate little identity with or support for the industry. This perspective adds a useful clarity to those who assume all publics will react similarly to large-scale infrastructure projects. A distinction in the geometries of utility-scale energy sites is worthy of further research, because it clarifies the conditions for acceptance or resistance to new energy infrastructure projects. Solar farms may constitute a third category: an area source, with its own distinct reasons for acceptance or opposition by an impacted public, because the potential for harm is equally distributed over a two-dimensional grid rather than radiating out from a point source. The Final Environmental Impact Statement of the FERC may have been written with the assumption that an energy transmission project will generate economic benefits similar to those of an energy production project. The impacted public seems, on the other hand, to have understood this distinction, reflected in the finding of no significant association between economic gain and attitude toward the project. These rural Appalachian landowners were aware of their own history of economic exploitation, considered the real costs and benefits of this specific project, and simply did not buy the arguments and inducements of outside interests.

Second objective: Survey perspective

The second objective was to determine if there is evidence of an association between political ideology and attitude toward the pipeline project. Ideology provides a shortcut for the formation of attitudes and opinions about ambiguous alternatives, a "perceptual filter" (Campbell et al. 1960). Prior research suggests that a conservative political ideology will associate with support for the pipeline. This finding has historical precedent, because the hallmarks of fiscal

conservatism, starting with Adam Smith's optimistic appraisal of the societal benefits of capitalism and extending through free-market capitalism and neoliberal ideology, is that a market economy, unfettered by anything but the law of supply and demand, functions more efficiently with a minimum of taxation, regulation, or concern for public welfare. However, the marketization of the economy inevitably produces a push for social protection against its self-serving tendencies (Polanyi [1944] 2001), exemplified by the dissent of social movement activists and government's regulation of industrial practices that are harmful to the public. The results of both the survey and the interviews show the intense push and pull of opposing ideologies. The investigation of the association between political ideology and attitude toward the pipeline project is an exploration of these countervailing tendencies in the context of rural energy transmission. An examination of these tendencies revealed both similarities and differences between energy production sites, such as fracking communities, where political ideology does draw actors toward support for polluting industries, and this rural Appalachian energy transmission site.

The analysis of our survey data found a statistically significant association between political ideology and attitude toward the pipeline project. However, Cramér's V indicated only a small effect. Differences between the actual and expected distributions of liberal, moderate, and conservative property owners showed that the association between political ideology and attitude toward the pipeline is more the result of liberal opposition than of conservative support. The survey found that 60% of respondents identified as conservative, 24% as moderate, and only 16% as liberal. If this tendency was known to the pipeline developer, it might have assumed this population would be a "site of acceptance," in Malin's terminology, because a conservative political ideology typically aligns with pro-business attitudes and minimal governmental

interference through taxation or regulation. With only 24% of survey respondents identifying as ‘liberal’, it is surprising to find that political ideology has such a small effect on attitude toward the project. Again, it is useful to pursue a more nuanced understanding of this finding through the perspective of the interviews.

Second objective: Interview perspective

Many of those I interviewed hesitated to identify themselves anywhere along the well-known Likert scale of political ideology, from extremely liberal, through moderate, to extremely conservative. Some wished to distance themselves from the polarized political climate of the day. Here is the way this distance was expressed by a small business owner with property in Greenbrier County, West Virginia:

Well, again, I feel like they're all tied together. The politicians, the corporate America, wherever lobbying, whoever pays the most is which way the I think most of our politicians sway. That's just my personal opinion. I don't have a whole lot of confidence in what's going on.

There may be a more subtle interpretation. Here is the background for that interpretation.

Pipeline opponents argue that eminent domain, when imposed, allows a pipeline developer to intrude on private property for a non-public use. David Harvey (2005:178) might characterize such a taking of private property for a non-public purpose as an ‘accumulation by dispossession’: “Dispossession entails the loss of rights. Hence the turn to a universalistic rhetoric of human rights, dignity, sustainable ecological practices, environmental rights, and the like, as the basis for a unified oppositional politics.” I argue that the imposition of eminent domain is a dispossession of place, to the extent that landowners may feel removed from the sense of safety,

identity, dependence, and attachment that they associate with their private property. Harvey, by all accounts, speaks to liberal ideology.

Landowners in the path of the pipeline, particularly those whose property is in the blast zone, object to such overreach, even though they are ideologically aligned with such conservative values as limited government, minimum regulation, and have little sympathy for a social safety net. They now find themselves in need of government that can effectively regulate the overreach of private enterprise. Rural folks are often (and I think accurately) characterized as fiercely independent and self-sufficient. “Some people think that in those sorts of situations that they don't have any choice, but to sign an easement.” (toxicologist and farmer, Giles County, Virginia). Many of those I interviewed just wanted to be left alone, and often said that was one reason why they chose the country life. The tension between people's disappointment with the lax protection from the pipeline incursion onto their land and their sense of self-sufficiency caused many property owners to avoid any ideological categorization. Malin found evidence for exactly the sentiment expressed above in her article entitled “There's No Real Choice But to Sign” (2014), but also the opposite in “When is ‘Yes to the Mill’ Environmental Justice...?” (2014). That latter perspective is represented by the retired farmer from Franklin County, Virginia, who felt the promise of a gas tap to the local industrial park more than offset what he considered the minimal hazard of the pipeline.

The cognitive dissonance between people's conservative ideology and their need for regulation of unfettered capitalism caused discomfort in many of the people who opposed the pipeline, but less discomfort among those who expressed support. I will explore this difference in greater detail in a later section. People did seem to find comfort in the support they shared with their neighbors. Sometimes that feeling of solidarity turned to activism.

When it happens in California, if it happens in Arkansas, it happens in New Jersey, that's dissociated enough that you say, well, hopefully it'll never happen here. But when something happens and it affects people that you know, and you've worked with, and you've had a very strong relationship with, I think that changes; the bar has been moved as far as what you will tolerate and what you'll forgive and what you forget. (retired veterinarian, Montgomery County, Virginia)

Many property owners who opposed the pipeline spoke of their association with organized opposition, through neighborhood meetings, activist organizations, or through an online presence. I identified no comparable organized support for the pipeline. I did not follow up on this observation, which may be worthy of inquiry at some later time. Among those who opposed the pipeline project, I did notice some discomfort among those who granted an easement, presumably because their neighbors might consider it a sort of selling out. Some property owners in this position were quick to detail their legal experiences with the pipeline developer, expressed in such words as those of a retired textile company manager from Franklin County, Virginia, who got advice from his son: "You know, you can't fight it. You might as well, he says, wait, and solve it at the door of the courthouse, the day you gotta appear. So he says, no need to hire a lawyer; it's gonna happen." He was defending property that had been in his family for "as far back as we can document the family tree: four or five generations." Sometimes laughter was a strategy for breaking the tension between those who had quickly granted an easement and those who fought it as long as possible. Said one landowner, "My cousin, they came right across his property and he took the money and ran with it. And I'm mad at him. His birthday is next Sunday. I don't even know if I'm going to give him a birthday card! [laughs].

During my interviews I was introduced to other long-held strategies for survival. I mentioned one earlier, of a large family that managed to keep the farm in the family while ensuring the long-term of the matriarch of the family. That kind of conservatism is not associated with political affiliation, but rather to a much older attachment to property, and deep cultural

rootedness. When property does change hands, it can involve an interview between buyer and seller, with the sale contingent upon the establishment of some kind of fictive kinship between families. One particularly memorable introduction to conservatism was not with the person I interviewed, but with a hired hand in Monroe County, West Virginia. He walked in to the cabin at lunchtime. My host asked him, “Are you for or against the pipeline?” His response: “I’m against it.” She pressed him: “Why are you, it’s not even near you?” He said, “I don’t know. I ain’t really got any particular reason.” When people have lived with precarity for generations, there is an assumption that if something does not have a benefit, the default reaction to it, and one that requires no particular reason, is to oppose it. People who are more economically resilient may choose to just be indifferent to an event that does not directly affect them, but for rural Appalachian people, the reaction has to be unequivocal. Surviving in precarity requires a clear, generalized decision, with no reason for explanation: if the action has no benefit, then it must be a cost, and it should be opposed. The speaker saying “I ain’t really got any particular reason” is not a brushoff. It just means that for him, opposition to an unbeneficial event is automatic, part of his indigenous knowledge. But he generously supplies a follow-up anyway: “It’s just, do we really need it? I mean, we’re not getting’ no benefit out of it.” That is conservatism. It is similar to the comfortably naturalized response I got a hundred miles away, in Pittsylvania County, Virginia, cited earlier, when I asked a farm owner why the pipeline came through such a rural area: “It was probably just like the cattle out here, you see. The reason they built that path, it was the easiest, quickest path to get there. And these are cows. And I think the humans are kind of the same way with it; they just go on the easiest path. I would imagine they probably also were thinking about if there's gonna be any opposition.” This is conservatism that often has a political affiliation, but its parsimony is more aligned with self-sufficiency and self-

determination. Many property owners expressed deep disappointment with governing bodies that did little to protect their right to make their own choices about what could and could not be done with their land. That disappointment might seem to align with liberal values. But their cultural heritage aligned with long-held principles of conservatism. So although the survey data suggest a weak connection between political ideology and attitude toward the pipeline, and 60% identified as conservative, the interviews revealed a tension between rural conservative values and property owners' expectation that government would intervene to protect that property. The survey's findings align with the standard urban-liberal/rural-conservative dichotomy. However, the interviews suggest caution by policymakers and regulatory agencies who conflate rural conservatism with conservative political ideology. The findings of a connection between ideology and attitude toward the pipeline project conflict with Malin's (2017:535) findings that "people who perceive more negative impacts from UOGE are *less* supportive of federal regulation...", due to free-market ideology. The owners of property in counties crossed by the Mountain Valley Pipeline provide much evidence of conservatism, in both the survey and interviews, but their ideology does not extend to less support for federal regulation. On the contrary, there is an overwhelming demand that the courts and regulatory agencies increase their oversight for what they perceive as an industry that has no interest in protecting their lives and property.

Third objective: Survey perspective

Prior research suggests that public reaction to hazardous energy production projects may be influenced by proximity to the hazardous object. Under certain circumstances a majority of people may support a project. Skinner and Sweeney (2012), for example, suggest that people's expectation that a pipeline would provide jobs increases with decreasing distance from the

Keystone XL pipeline. But if its environmental cost is too high for owners of property close to a project, relative to its perceived benefits, people may choose to oppose such a project. The third objective of this research was to simply find evidence for an association between spatial proximity to the pipeline and support for or opposition to the project by analyzing survey data. The interpretation of the finding is then based on interview data, presented in the next section. Gravelle and Lachapelle (2015) cite a number of studies that found a logarithmic relationship between distance and policy attitudes. The evidence in the present research is made clear by a dichotomous categorization of blast zone vs. control zone. It occurs on a scale that minimizes the difficulty of distance decay, due to the comparison of groups that are in the same county, rather than making much more macro-scale comparisons, such as by region. The use of GIS technology to subdivide survey respondents by blast zone and those at least 10 miles from the pipeline but in the same county, also produced a level of precision unmatched in larger-scale studies. Property owners had a visual fix on the location of the pipeline, and usually knew whether they were within or outside of the blast zone. This level of precision in respondents' knowledge is superior to arbitrary distinctions between 'near' and 'far.'

The analysis of survey data for Hypothesis #3 resulted in the finding that there is a statistically significant association between attitude toward the pipeline and physical/geographic distance from the pipeline. Cramér's V indicated a medium effect size (a moderate association) and therefore worthy of attention. As I noted in the results section, the number of residents in the blast zone who opposed the pipeline is much higher than the number expected by the chi square table. A higher level of opposition among property owners closer to the pipeline is consistent with place-protective, sometimes pejoratively labelled NIMBY arguments cited earlier, and also with Smith's (2002:161) assertion that proximity makes the most difference when the

contentious project is literally in one's backyard. However, there is little inverse-NIMBY sentiment, such as described by Malin (2014) for uranium mining, Jerolmack and Walker (2018) for fracking, Gravelle and Lachapelle (2015) for the Keystone XL pipeline, Greenberg (2009) for nuclear site planning, and Michaud et al. (2008) for offshore oil platforms energy siting controversies. Since inverse-NIMBY sentiments are characteristically driven by economic considerations, and the first objective of this research found no significant association between economic considerations and attitude about the pipeline project, the lack of inverse-NIMBY sentiment is no surprise, but deserves a closer explanation by turning to the interviews.

Third objective: Interview perspective

As stated in the results section, people who live close to the Mountain Valley pipeline are more likely to oppose it than those who live farther away, for reasons not revealed by the survey data. Interview responses to queries about distance-related concerns among blast-zone residents suggest why proximity is related to pipeline opposition. The discussion is filtered through the lens of the hazards-of-place model (Cutter 1996), which defines vulnerability to environmental hazards in terms of their potential for loss (Cutter et al. 2003:242). The interviews revealed many references to such losses. Cutter and also Brooks (2003:9) argue for a distinction between social and biophysical vulnerability. Following that distinction, my interviews, all with owners of property at least partially in the blast zone, focused on property owners' potential for loss in the sense of their being physically vulnerable to danger, as well as being socially vulnerable as property owners facing disruption to their sense of place. My analysis is also influenced by Blaikie and associates (1994), who approach any kind of disaster from an explicitly sociological perspective on risk and social vulnerability. That perspective tends to normalize and socialize risk: it becomes a part of everyday life, similar to the way contemporary societies adapt to

successive waves of pandemics. It is consistent with Beck's ([1986] 1992) argument for the modern emergence of a relentless 'Risk Society'. The process by which the MVP, a novel event, becomes normalized, is described in more detail in a later section.

The framing of interview questions was informed by research arguing that social vulnerability is influenced by such factors as poverty, inequality, marginalization, and access to services (Blaikie et al. 1994). This framing runs counter to the emphases of power-elites, who would rather focus on the natural or technological aspects of hazards than on social vulnerability. The framing offered in the FERC's FEIS reflected this emphasis on technological considerations and consequences to the natural environment rather than on social, economic, and political factors that are more difficult to address. That minimization of impacts on people did not escape the attention of those living closest to the pipeline, particularly when they asked questions regarding human impacts of the pipeline project at informational meetings, and then got few answers. The micro-scale of investigation afforded by interviews with owners of property in the blast zone offered insights more intimate than the broad factors of poverty, inequality, marginalization, and access to services available to investigations at a larger geographic scale. So the present discussion emphasizes the unique characteristics of this case study sample, particularly focusing on property owners' concern for biophysical danger and disruption to their sense of place. Both concerns present the pipeline as an environmental hazard with the potential for loss, as argued by Cutter and others.

Having surveyed the risk literature, I assumed that property owners' concerns about the *danger* imposed by the pipeline project would focus on the potential for harm to themselves and, when applicable, their families. That was certainly the case for many people, particularly for those with a residence that was itself very close to the pipeline.

It kills. I mean, absolutely I'll be gone if something happens. I won't know about it. That's the beauty of it. I mean, part of me says what a great place to be. If I was half a mile down the road, I might be burned to death. But here I'll just die. So I, you know, it's kind of like, okay, I won't even know it it'll be so sudden. But then part of me says, that's not the way I want to die. I don't want to die that way. If it could be when I'm asleep, that might be okay. Not when I'm awake. (retired public administrator, Roanoke County, Virginia)

This rather fatalistic reaction to the potential for harm is akin to what one might expect from a person living near a nuclear powerplant, a toxic waste dump, or along Cancer Alley in Louisiana. It was also the sort of calculated reaction I heard from property owners who considered the statistical probability for a pipeline accident, such as this comment from a retired legal professional: "If you assume that they continue to run gas through that pipeline, I would say that over the course of 25 years, there will be close to a hundred percent probability that there will be an explosion somewhere." Few of the residents I interviewed had no opinion about the probability of a pipeline disaster, ranging from 'never' to 'as soon as it goes live.' Recall from earlier discussion that low-probability/high consequence risks are more threatening to exposed publics than are high-probability/low consequence threats (Von Winterfeldt and Borchert 1981), and also Douglas' (1992) observation that low probability, high consequence danger is of great interest to vulnerable publics, because they can use them to assign blame. Lempert (2009) summarized the difficulty of adjudicating the legal claims of low probability/high consequence claims, such as shipping and construction accidents, so it is not surprising that there is a wide range of reactions to the low probability of a pipeline explosion.

Perceptions about the potential for harm were based not only on estimates of what might happen in the future. They were also used as a tool for framing arguments for and against the

pipeline project in the present. Here is how the pipeline's danger was framed by a dairy farmer in Pittsylvania County, Virginia, by reference to a nearby existing pipeline:

And my son lives within a mile of the pumping station where this is going to the compression station or whatever, and the dairy isn't but about two miles from it, and it's been down there the whole time the dairy's been there, so you hear all of these things are just scare tactics that just don't want the frack main [?], or whatever.

He argues that the pipeline poses no danger to the dairy, and any such argument is an unfounded framing argument by pipeline opposition. But a landowner in Franklin County's statement illustrates how damage to her water supply supports her oppositional framing:

First words to Mountain Valley Pipeline: 'You're going to ruin my well. It is so sensitive.' They ruined my well. Guess what they did? Nothing. And it's even in my contract. So you think I believe anything that they say to me or anything that comes from them? No. My water they've disrupted, my creek they've disrupted, my family. You name it. They have affected every part of my life.

Differences in property owners' perceptions of loss reinforce the argument that "individuals strive to obtain, retain, and protect that which they value" (Hobfoll 1991:187). The argument seems applicable for both opponents and supporters of the pipeline project.

My early assumption was that danger would manifest in the form of a perception that if the pipeline were to explode, those living closest would be most concerned about their physical safety. But even on the first interview my perspective on danger broadened into a wider understanding of what constituted a threat. One comment from that first interview: "And we all decided that they were not going to make them an easy job. They would not be welcome on our farms or on our properties." This hints not at concern for personal safety, but at a threat of loss to property. Recall Table 8, showing that 48.6% of surveyed residents have family that has lived in the same county for more than 100 years, and consider the place-protective behavior implied by

that remarkable statistic. This provides insight into why owners of property felt threatened by the pipeline, and motivated to protect their property. Recall also the discussion of rural conservative values, which emphasized land as the major asset of many extended families. As I conducted further interviews, property owners were more often likely to mention danger to their property than danger to themselves. The personal dangers they were more likely concerned with were snakes, ticks, farm machinery, and getting on the wrong side of a cow. I recorded 41 codings for ‘personal harm, danger, or risk’. This is not insignificant in a pool of 25 interviews. However, I recorded 48 codings for ‘harm to wells or water.’ These are dangers to property, not to person. I enumerate these water-related concerns in Appendix D. As I discussed in the results section, property owners were often protective of water as a reliable, high-quality, cherished natural resource, for themselves and often for their farm animals. The protection of water is of little general concern to city dwellers and others clustered around point-sources of pollution. I suggest that regulating authorities and concerned publics pay more attention to water-quality threats along the path of utility-scale energy *transmission* projects than they might assume from research that focuses only on energy *production* projects, as they are more likely to affect rural and agrarian populations with no municipal water supply.

The finding that land ownership in the blast zone is associated with opposition aligns with concern for personal safety and concern for highly regarded and vital sources of water. The biophysical vulnerability associated with such *dangers* posed by a natural gas pipeline have a low probability, but a high consequence. When a well, spring, or creek fails, it can be devastating, even if it does not match the magnitude of an explosion. The social vulnerability of *disruptions to sense of place*, on the other hand, have a high probability, but relatively low consequence. Nevertheless, in the case of the Mountain Valley Pipeline, people’s sense of

disruption to their dependence, attachment, and identity with their land generated moral shock and a sense of environmental injustice. David Harvey's (2005:178) concept of 'accumulation by dispossession' recognizes the consequences of such a taking of a public or private resource by power elites. Extending David Harvey's (2005:178) concept of accumulation by dispossession, I argue that many property owners experienced a dispossession of place as the imposition of eminent domain laws removed them from their sense of safety, identity, dependence, and attachment to their property.

Earlier, following the theorization of Relph (1976) and Tuan (1977, 1980) I suggested that a person's sense of place is the socially constructed product by which a location develops meaning. A disruption to a person's sense of place may trigger what Snow and Soule (2010:53) called an animating grievance. For many of the landowners I interviewed, that disruption occurred when they sensed that the pipeline threatened the physical integrity of their property, so they would no longer be able to depend on it to satisfy their physical and spiritual needs. I have discussed the loss of wells and water, as a physical need by people and animals. Landowners also expressed non-physical needs that tie them to their land. A landowner in Franklin County explained,

For myself and my husband, you know, we love this land. We have 18 acres here. We love this land. We love the trees... This is what's belonged to our family for so many years... We don't want to be forced out just because some pipeline comes through and they want what they want.

Another landowner in Monroe County expressed her dismay by saying, "I think for me, it's mostly been grief, but it is a certain loss of sanctuary." People described prized viewsheds, berry patches, hunting places, and fishing ponds that tied them and their ancestors to the land. They also described a newfound or regenerated sense of dependence on their neighbors,

triggered by the animating grievance of intrusion onto their home places. Dependence on rural lands and close neighbors allows a certain isolation or privacy, an autonomy or independence that is a source of pride and satisfaction. They described how, during the Great Depression, their families raised everything and never went hungry, and neighbors could always call on neighbors for help. Others describe the feeling of yearning for a lost landscape, similar to the ‘solastalgia’ that Albrecht (2006) describes as a stressful dispossession following open-cut coal mining in New South Wales, Australia.

The concept of place dependence suggests the exploitation of a resource. While it is true that rural people use both their natural and social resources to survive (even when tied to the outside economy), I suggest an additional understanding that focuses around the idea of deep cultural rootedness. I argue that in the case of the property owners I interviewed, rootedness is less an identity (there was little response to identity as ‘Appalachian’, for example), and is instead an attitude. Hummon (1992) associates deep cultural rootedness with indigeneity, but this fails to recognize that the land was stolen from Native American people. When connectedness to place is disturbed, it triggers a powerful protective response. Harvey (1996:264) argues that we identify ourselves by locating ourselves in space and time. We create boundaries that declare who we are and who we are not. Longtime landowners’ perception of intrusion by pipeline authorities quickly resulted in the authorities’ relegation to outsider status. Deep cultural rootedness is illustrated in this passage by a longtime resident of Franklin County:

The stories that my father-in-law would tell when he was alive about his hunting through the land... my husband's grandfather and his father and where they're buried on the land and the hunting and the gathering of the artifacts that they did, the stories that came down literally from generation to generation, to generation about the land, their land that they grew up on and how that was gonna be passed down to us.

These deep ancestral and cultural connections are consistent with research that connects place dependence with experiences shared among family and neighbors (Hay 1998; Kyle and Chick 2007). Residents' descriptions of their attachment to their home places emphasized their desire to protect and sustain the property under their care. After a rainstorm that overwhelmed meager silt fences, a retired engineer from Pittsylvania County declared, "Where's this mud go? It's running down the hill. It's gonna end up in Chatham's reservoir. Not all of it, but some of it will. And so you should have some say in something like that. Obviously, we don't."

Place attachment binds a person to a geographic location with emotional ties that may span the entire life course (Lewicka 2008, 2010; Low and Altman 1992; Shumaker and Taylor 1983). The sentiment was expressed eloquently by a musician in Roanoke County:

To be able to go out there and sit and just watch the lightning dance across the sky, the little creek you crossed over, coming up our driveway, I've got a little chair just to go down there and sit. And, you know, frogs will come and be sitting beside me, the deer. Even eating our garden, I like the deer.

Such a sentiment is evidence that supports the early work of the phenomenologist Edward Relph (1989:26) when he wrote that places "are constructed in our memories and affections through repeated encounters and complex associations."

The point of belaboring place attachment is that in the eyes of property owners, pipeline authorities seem unconcerned or unaware of the intangible value that owners ascribe to their land. Despite the evidence from their own hired anthropologist, that "Peter's Mountain could be considered a rural historic cultural landscape" (FERC/FEIS 2017b: 474), it, like the historic village of Newport, Virginia, were placed in the path of the pipeline. Recall from earlier the quote by Aldo Leopold (1968): "We abuse land because we regard it as a commodity belonging to us." Recall also Harvey's (1996:298) warning that there are powerful forces that tend to

devalue anything that cannot be commodified. Residents expressed resentment that the pipeline developers considered their land to be an exploitable commodity. They understand that the land in their care had historically been degraded by the extraction industries (e.g., coal, timber), and recognize that it does not have the capacity for inexhaustible exploitation, as in this passage from my discussion with a landowner in Roanoke County:

Well, I went to see my great aunt and great uncle, and I mean, they were just down in this holler, down in near Hazard, Kentucky. Hindman was the name of this mountain community where my dad was born and you could hear the booms of the mountain top removal when we were visiting them. We had our first child with us when we were there. All the big trucks coming up and down the holler; it was just rape of the land, rape of the people. So yeah, I think there is that, that has kind of colored my thoughts as to why this is such an injustice here with this fossil fuel.

The awareness of exploitation comes directly out of family history. Recall the description of a resident with generations of ties to Monroe County. He said what makes people so attached to their land is that when the coal companies controlled everything, five generations ago, the only land that was under people's control was a 50 by 50 garden lot that they did not even own.

Pipeline authorities seem to have a difficult time coming to terms with the nonquantifiable attachment and identity that landowners feel toward their property. The literature (Hinojosa et al. 2019; Loewenstein 1999; Shafir 2013) suggests that some people value living in difficult or isolated environments. They tend to feel greater attachment and a greater feeling of identity than might be expected. This is reflected in 26 codings of emotional effects of the pipeline, and 28 codings for disruption to landowners' sense of place. As I argued earlier, the emotions associated with danger and disruptions to residents' sense of place are located within the theoretical perspective that that they are cultural accomplishments in the construction of risk. The literature also reports a significant positive relationship between place identity and pro-

environmental behavior. Pipeline developers may not have anticipated such a relationship among rural Virginians and West Virginians, assuming that their conservative ideology would cancel out the liberal bias toward environmental stewardship. As the interviews suggested, in the case of the Mountain Valley Pipeline, property owners saw no contradiction between conservatism and place-protective behavior.

A disruption to place attachment that consistently came up in my interviews was the pipeline authorities' use of eminent domain to take property. As others have noted, eminent domain enables companies to proceed with construction whether landowners cooperate or not (Lombardi and Hopkins 2017). The landowners I interviewed often argued that FERC should not have granted the use of eminent domain because they believe eminent domain should be reserved for projects that have a public use. In the words of a retired veterinarian from Montgomery County, "If you're building an interstate highway, if you're building a new school, if you're building a water treatment plant, if you're building something that is for the common good, then eminent domain is very, very important." Most property owners who expressed an opinion about the use of eminent domain would concur with this statement. However, opponents facing the use of eminent domain might well be cautious of what is often a follow-up statement: that eminent domain should not be used by a company in the pursuit of profit. In fact, eminent domain is appropriately used by a for-profit company if there is an overwhelming benefit to the public. Arguments regarding eminent domain law are beyond the scope of this discussion, and best left to legal scholars. As noted earlier, when the taking of private property has no overwhelming public benefit, it is a larger social problem that conforms with what David Harvey (2005:178) calls an 'accumulation by dispossession.' Pipeline opponents, even those who espouse a conservative political ideology, uphold a fierce legacy of independence in an American ethos

that militates against such a dispossession by corporate interests. The invaluable insights of my informant with a legal background included an understanding that “the rule of law comes down to protecting property,” which she said is the basis of criminal law, whether against one’s personal property or against one’s body. Her reading of eminent domain law is that it can be justified, but only when it serves a truly public purpose. This is a powerful statement, and one that provides guidance not only for the protection of a home place but any intrusion on property.

Land use implies an unequal access to a scarce resource and with it, the privilege of attachment, identity, and dependence on that place. Place attachment always has a dimension of inequality, or unequal access, by age, gender, race, and wealth. Whose place is it? Whose place was it? Whose privilege controls it? Whose privilege should not control it? The testimony of landowners drives answers to those questions into new territory. Those answers have implications for impacted publics, policymakers, and the natural environment.

This study is limited to how landowners assess the danger and disruption of a hazardous materials pipeline project, since those two factors are particularly relevant for those living closest to it. It is just one of many possible approaches, structured to either corroborate or challenge the findings of similar studies. It explored the influence of three factors: economic self-interest, political ideology, and geographic distance on residents’ attitudes toward the project, using a mixture of quantitative and qualitative methods.

I found no support for prior research that linked economic self-interest with support for the pipeline project. Neither the inducement of jobs nor the financial benefit from selling an easement induced much landowner support. I argued that the general not-in-my-backyard sentiment may be attributable to differences between the costs and benefits of a site of power production, like a powerhouse or other point source hazard, and a site of power transmission,

such as this pipeline. I found little support for the claim that political ideology influences attitude toward a contentious environmental project. The survey data indicated a strong conservative ideology, which, according to other research, should generate support. However, the interviews revealed a strong and surprising pushback against what property owners considered the overreach of an underregulated industry. Property owners considered the pipeline to be an unwanted intrusion into the sanctity of their space. That attitude may be tied to the linear and rural characteristic of this utility transmission project, compared to the more geometrically centralized and often urban nature of point-source projects. My third objective was to test whether proximity influenced attitude toward the pipeline, since previous research finds no consistent trend toward support or opposition due to geographic distance. The analysis of survey data revealed a medium-strength association between proximity to the pipeline and attitude toward it. The owners of property in the blast zone expressed a deep attachment to their home places that triggered concerted place-protective behavior, including organized protest and pushback against the assertion of eminent domain. Pipeline authorities underestimated the importance of owners' attachment, dependence, and identity with their property. That oversight contributed to years of delay and billions of dollars in cost overruns.

B. Second aim: Explore the value of a theoretical alternative

The *first aim* of this research was to either corroborate or challenge prior research suggesting that an exposed population will either support or oppose a hazardous energy infrastructure project on the basis of economic self-interest, or perhaps their political ideology, or their physical distance from the project. The results reveal that for this and perhaps other sites of utility-scale energy transmission, economic self-interest and political ideology are unimpressive in explaining landowners' attitudes, compared to their explanatory ability in sites of energy

production. That finding motivated the *second aim* of this research, which was to develop a more robust understanding of landowner response by exploring the process by which residents develop their understanding of such a unique object.

As I was interviewing people living close to the blast zone, the question that was always in the back of my mind is one posed in the introduction to this study: How is it that some people, exposed to the same harm as others, support, are indifferent, or even acquiesce to what their neighbors oppose? If distance were the only factor that property owners considered in their attitude toward the pipeline, why would not all property owners so very close to the pipeline have the same assessment of the project? There is a need for a conceptual framework capable of addressing such questions within this field of inquiry. Recent research suggested that individuals and groups interpret and evaluate a novel phenomenon according to an orderly process, with results that are predicated on the knowledge, beliefs, and values that they share with others in their social groups or categories. Researchers have applied that process, which produces what Moscovici termed a ‘social representation’ of a novel object or event, to gain a better understanding of public reaction to a range of environmentally contentious projects. The Mountain Valley Pipeline project provided the opportunity for testing that process at an unusually fine scale. That scale allowed a close observation of the specific dynamics of actors and power elites as emphasized by McAdam (1988) and Gaventa (1980). That microsocial perspective has a particular sociological appeal, explained by Rateau and Moliner (2012:481), who wrote, “representations are not the product of society as a whole, but the products of the social groups who build this society.” This ‘middle up’ approach is neither generated exclusively at the level of the individual nor reminiscent of Durkheim’s ‘top down’ conception of a collective representation that is produced by the entire society (Jovchelovitch 2008). The

approach may inform researchers, and also policymakers and utility infrastructure developers who, having a more comprehensive view of the concerns of impacted publics, may then decide to either modify or refrain from such projects.

As reviewed earlier, social representation theory asserts that people rely upon familiar, everyday experience to make sense of novel, unfamiliar, and uncertain information (Smith and Joffe 2013:28). Much of that ‘already known’, ‘taken for granted’ reality resides in the earlier lives, including family and work life, of ordinary people. When shared it becomes a *sensus communis*, or common sense (Arendt 1971:50). This approach seemed ideal, as it had to others studying contentious environmental projects, but it had not been previously applied at such an intimate scale among residents so close to a dangerous and disruptive utility transmission project.

The interview protocol for my 25 semi-structured interviews mirrored the sequence by which a social representation emerges: from Step One, which questions how property owners became *aware* of the project, to Step Two, which asked how they *interpret* the project, comparing it to their prior experiences (mostly from their work or family), and with special attention to their ideas about danger and disruption to their home places. Step Three asked how they *evaluated* the pipeline itself and the pipeline project, adding a valence to this previously neutral or ambiguous social object, and then Step Four asked about their *response* to the pipeline, whether support, opposition, quiescence, acquiescence, or indifference. I tried to follow that sequential order, to avoid biasing their description of a more historically recent part of the sequence prior to discussing an earlier stage. The first question, about how people first became aware of the pipeline, established an intuitive logic that facilitated further discussion. I think it worked well, based on the candid, generous responses I got to my questions. I am not aware that an interview protocol has explicitly followed the sequence by which a social representation is

formed, but I recommend it for similar research. The depth and breadth of responses to the interview questions added nuance and validity to the quantitative results detailed in this discussion and in the results section.

Interviews began with a question about how the property owner became *aware* of the pipeline project. This stage manifested in many different ways: a letter from MVP, survey stakes on their property, neighborhood meetings with pipeline opponents (to exchange information and inform people of their rights and responsibilities), public scoping sessions and informational meetings by MVP representatives, unannounced property visits (sometimes without prior notice), by telephone calls from the contractor, through newsletters by the contractor, from TV news or by county or regional newspaper, by meetings with the Farm Bureau, by talking to neighbors or church friends, or by seeing protesters and/or signs. In the results section I detailed the confusion, skepticism, alarm and helplessness felt by most landowners, the support for the project felt by others, who anticipated personal or public economic gain, as well as the mixed reactions or indifference that were also in evidence.

The point of detailing these interactions was to establish that the pipeline project was a novel event in the lives of property owners. A Roanoke County resident described her reaction to a meeting: “When you're a citizen and you know nothing about what's going to happen, you don't know who, or how or why to talk to people about that stuff... We were all so naive about everything that was getting ready to happen to us, that we didn't know even how to go about finding out what was going to happen to us.” Another, from Montgomery County, said, “It was all people that were scared to death like myself, and who knows what was going to happen next, and the construction started.” Some property owners described the public scoping and information sessions as a ‘dog and pony show,’ intended to mislead the public and defuse

concern. But concern remained. A 42 inch pipeline operating at almost 1500 pounds of pressure per square inch, through rugged, karst-filled terrain would be unprecedented: a novel object for both property owners and the pipeline developer.

The pipeline, as an unfamiliar object, and the pipeline project, as an unfamiliar event, become familiar through *interpretation*. It is a socially-mediated, sensemaking part of the process, often filtered through the lens of familial and occupational experience. Although novel, the pipeline became ‘anchored’ or linked to similar phenomena. The knowledge, beliefs, and ideologies associated with those phenomena were used to tether it to something familiar, rendering it less of a threat. The interviews revealed that the pipeline was often interpreted similarly by social groups and categories who share a common social space. I assumed, since my interview collaborators had property in the blast zone, that physical danger would be their utmost concern, followed by the disruption they would feel to their sense of attachment, dependence, and identity associated with their property. Instead I found that danger was often interpreted in terms of threats to the safety and security of their sources of water, for themselves and their animals. Whether interpreted in terms of physical safety, concern for water, or in terms of the often emotional and deep-seated connection to the land, property owners anchored their interpretation of the pipeline to objects and events in their earlier familial and work history. Property owners anchored this novel event to their work life, comparing the danger of a pipeline explosion with the danger of being stepped on by a cow, for instance. A property owner with a background in propane delivery interpreted the danger of a pipeline explosion as minimal, based on his work experience with what he considered a safe industry. Anchoring was also referenced to the danger and disruption of similar environmental hazards, such as fracking sites, truck and rail accidents, or natural disasters.

The pipeline, which at first was an unfamiliar and ambiguous object and event, became anchored to something familiar. Once familiar, it assumed a concrete identity, objectified as a thing in itself which can be *evaluated* in its own right. This evaluation is a dynamic, daily achievement, elaborated through dialogic interaction (Castro and Batel (2008:493-494). Howarth (2004:4) says that the social representation ‘re-presents’ an existing social object, making it available as a resource for social change. Howarth (2006:696) says this is the major function of a social representation. The evaluation need not be accurate. It may or may not conform to probabilistic thinking. It is instead a social construction, which many theorists (Beck ([1986] 1992; Douglas 1992; Joffe 2003) argue is characteristic of risk. I wrote earlier that I suspected that pipeline fighters would anchor the pipeline project by associating it with similarly perceived bad actors such as the coal, timber, and other resource extracting industries, and then objectify it as a specific corporate plunderer. For example, a landowner in Monroe County, West Virginia connects fracking with her earlier experience with strip mining: “My understanding is that this gas, I think it comes from a fracking source. I grew up in West Virginia when they were still strip mining. And that just scarred so much.” Predictably, her response was to oppose the pipeline. But pipeline supporters, because of differences in their values and ideals, may see the same industry in a different light. Said a small business owner and landowner in Greenbrier County, West Virginia: “You can’t hold back progress. We’re trading one fossil fuel for another.” He says he would be concerned about the pollutants that are injected into the ground during fracking operations, but “it doesn’t affect me, so I really haven’t investigated it.” The linkage between interpretation (a bridge fuel) and evaluation (indifference) is clear. His response was to support the pipeline project. Compare that to the occupational background of a public agency administrator in Roanoke County:

This is not for the greater good of the citizens. This is for the greater good of the people who have stock in EQT and Midstream Pipeline. And none of this is going to the communities that it's going through. It's devastating communities and not one red dime or one CCF of gas is going to any of those communities. It's just tearing communities apart for personal gain, not public gain.

Again, the property owner anchored her interpretation of the pipeline to her personal history of community service, and evaluated the project, including a negative valence, in a way that is consonant with her values. Her response was unsurprising: unconditional opposition to the pipeline.

The sequence between awareness, interpretation, evaluation and response is not always so straightforward. Many landowners who sold easements indicated either quiescence (passive opposition) or acquiescence (passive acceptance). People in these ambiguous categories communicated a sense of conflict and stress compared to those who expressed a straightforward preference for either support or opposition. Some sold an easement out of financial need; others sold an easement because they lacked the financial ability to fight the pipeline in court. Their sense of conflict reflected the tension that Festinger (1957) termed cognitive dissonance, conceptualized as the stress of reconciling contradictory cognitions. Moscovici took a less psychological and more sociological approach to ambiguity by arguing that the social self has multiple identities that coexist despite contradiction. He argued that “the coexistence of cognitive systems should be the rule rather than the exception...” (Moscovici 1976:285-286, translated and quoted by Jovchelovitch 2007a).

Many property owners expressed both opposition and resignation when speculating on the long-term outlook for the pipeline.

Well, five years from now, I would like to think that the pipeline will be defunct, out of business, and there will be no pipes in my yard. That's what would be the best outcome,

in my opinion. The worst outcome would be that there'll be a 42 inch high pressure pipeline buried a hundred feet from my house that you know, is going to be in the wetlands and it's going to rust out, explode and all that. So, you know, pick anywhere along that spectrum, and you can find me on any given day. (Roanoke County resident)

This research might have been better informed if I had attended some of the early informational and organizational meetings, as far back as around 2014. As it was I had to rely on the generous recollections of property owners who had been involved with those meetings, along with scoping sessions, protests, court battles and confrontations with pipeline contractors and company representatives. This research makes a number of contributions and challenges to the literature, but its greatest accomplishment may be the documentation of the range of thoughts and emotions of rural landowners who remain unknown and unrecognized by corporate and civil powerbrokers. If they find their way to these pages, I hope they recognize that those with less power and authority deserve a fair shake.

Conclusion

No prior research that I am aware of has used the theoretical power of social representations at so close a geographic scale. The use of a GIS-generated landowner database allowed an exceptional level of precision, differentiating between blast zone and non-blast zone owners of properties in the same counties. The more I know about the common-sense, intuitive process that produces a social representation, whereby a novel object or event is rendered available for a social response, the more I believe in its organizational and explanatory power. It may hold promise for social change agents as a structure for understanding the perspectives of contending parties, whether on the opposite sides of environmental debates or for any number of contemporary social problems. I also think that the distinction between landowner response to utility scale energy *production* sites and utility scale energy *transmission* sites is important for

project planners and policymakers. This study suggests that economic and political ideological factors that have been used to explain differences in public attitudes toward energy production projects in prior research may not be important factors for energy transmission projects. The study suggests the value of future research that explores potential causal connections between landowner attitude and factors specifically relevant for energy transmission projects: distance, danger, and disruption to landowners' sense of place. I also believe, because of the growing trend toward decentralized utility transmission strategies, that it is important to compare and contrast the differences between point-source and linear source energy projects, as well as such novel geometries as the area-sources of power being developed with solar and wind farms.

Interviews with landowners served two purposes: validating and qualifying the results of the quantitative inquiries, and then investigating how closely landowners' experience with the pipeline project mirrored the sequence theorized for the production of a social representation. The results of the quantitative inquiries alone did little more than either corroborate or challenge the conclusions of similar research. However, its findings motivated the pursuit of interview data that added detail unattainable with studies at larger scales, particularly focusing on the danger and disruption most intensely experienced by the owners of property in the blast zone. The process by which the pipeline, as a novel object, was interpreted, evaluated, and then made available for a specific response provided a generalizable, theory-based, structured strategy for explaining how it is that some property owners supported a contentious project that their neighbors opposed when faced with a similar exposure to danger and disruption. I credit the property owners closest to the pipeline with correcting my assumption that physical danger is any less important than the danger to cherished and vital sources of water for themselves and

their crops and animals. And I gained a deep respect for people's profound attachment, dependence, and defense of their home places.

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Appendix A. Interview Protocol

Date of interview _____

Landowner

ID _____

Pseudonym _____

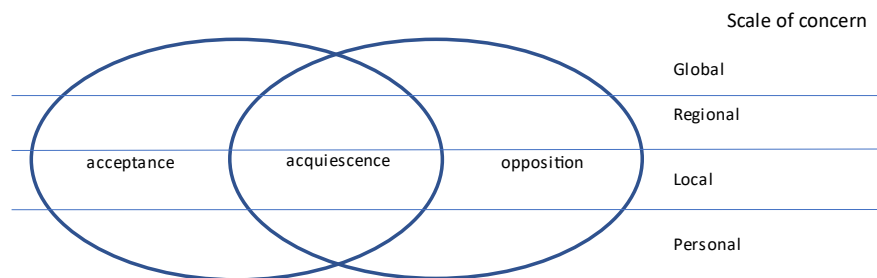
- ☐ Test audio recording equipment
- ☐ Introduce yourself: *Steve Gerus, doctoral candidate, VT Soc Dept, longtime local resident*
- ☐ Discuss the purpose of the study: *To know more about how property owners come to think about the pipeline project*
- ☐ *Thanks for volunteering to follow up the survey with this interview*
- ☐ Explain the structure of the interview: *1 hour, audio recording, taking notes, transcription with pseudonym*
- ☐ Request informed consent: *Discuss form via hard copy, ask for verbal consent*
- ☐ Ask if the person would allow parts of their audio file to be used in an online story map.
Requires signature
- ☐ Ask if there are questions
 1. Thinking back, when did you first hear about the pipeline project?
 - a. Was it through the government, the pipeline company, media, through neighbors, friends, church, or something else? Who do you, and did you, tend to trust?
 - b. At the time, what were people saying about the project?
 2. Interpretation: When you first heard about the pipeline project:
 - a. What was your own first impression?
 - b. What other kinds of things, from your experience, seemed similar to the project?
 - c. If you had to categorize the pipeline project at that time, what other kinds of things would be in the same category?
 3. Now that you know more about the pipeline project:
 - a. Describe how the meaning or the significance of the project has changed between then and now.
 - b. Do you now think it is similar to other kinds of things, or is it unlike anything else? Please explain.
 - c. In what sense would you consider the pipeline project to be beneficial? Please explain.

- d. In what sense would you consider the pipeline project to be harmful? Please explain.
 - e. Overall, do you think the project is beneficial or harmful to you, your family, your neighbors, or any larger population?
4. Some people think the pipeline project presents certain dangers, even if they think the project has an overall benefit.
- a. What do you think about any kind of danger that you associate with the pipeline?
 - b. Given your background and experience, how is danger different for you, compared to others? What would you say is, or was, the kind of work you do or did?
 - c. What other groups share your thinking about danger?
 - d. Are there differences in danger that depend on how far your property is from the pipeline?
 - e. How likely do you think it is that the pipeline will explode? Very unlikely, somewhat unlikely, somewhat likely, or very likely?
 - f. Is there anything that makes you, or where you live, more or less vulnerable to any harm from the pipeline?
 - g. Is there anything that would make you, or where you live, more or less able to bounce back following a pipeline disaster?
 - h. If the pipeline did explode, how severe do you think it would be? Very severe, somewhat severe, not very severe, not at all severe?
5. Some people think that the pipeline project disrupts their connection to the place where they live, even if they think the project has an overall benefit.
- a. Please describe how connected or attached you feel to your property.

Do you depend on your property to meet your needs? If so, please explain.

- b. Is your sense of identity tied up with where you live, with how you think of yourself, or how other people think of you?
- c. Please describe any disruption the pipeline project has caused regarding your connection to the place where you live?
- d. Has the pipeline project changed the way your property is able to meet your needs? Please explain.
- e. Has the pipeline project changed the way you think about yourself, or the way other people think of you?
- f. Has the pipeline project increased, decreased, or had no effect on the ties you have to your property, or to the larger (local, regional, national, global) environment?

6. It seems as though your experience with the pipeline project has given you a clearer idea of what the project is about, and what it means to you and other people.
- Is your overall opinion about the project that it is good or bad for you, or do you just throw up your hands about it, or does it just not make any difference to you?
 - Is your overall opinion that the project is good or bad for your neighbors or other larger groups of people, or do you think they mainly don't care about these kinds of projects?
 - After considering all the potential costs and benefits, do you support or oppose the pipeline project, or do you just give in to it or are you indifferent to it?
 - Do your family, friends, and neighbors generally agree with your opinion?
 - Please describe any change of opinion you think you might have after, say, five years.
 - How would you identify yourself on the political spectrum, where 1 is extremely liberal, 2 is liberal, 3 is slightly liberal, 4 is moderate/middle of the road, 5 is slightly conservative, 6 is conservative, 7 is extremely conservative, and 8 is some other category?
 - Have you signed an easement with the pipeline company? Have you received your payment yet?
 - Please comment on where you think your opinions regarding the pipeline project put you on this figure:



7. Is there anything else you would like to say about the pipeline project, or anything else you feel it is important for me to know?

Concluding Statement:

- ☐ Thank you for your participation
- ☐ Would you like to see a copy of the results?

Appendix B. Codes and Thematic Structure

	Code	Code #	# codings
1	Awareness: Encountering the pipeline project as a novel event		
1a	Scoping sessions; what the neighbors were saying		
	recreancy: distrust of authorities	44	50
	lack of agency	16	47
	sequence of construction	73	40
	history, personal or local	32	38
	exploitation	12	32
	first impression of pipeline project	5	29
	eminent domain	13	28
	community benefit, building community capital	17	22
	sense of place	25	20
	early organization	40	18
	key player in network	39	17
	pipeline representatives	45	16
	recruitment into opposition	46	11
	fracking	36	8
1b	Dealing with authorities and landmen		
	political/legal strategy of MVP	41	65
	bad action by pipeline contractor	22	64
	story	74	53
	misinformation	57	51
	recreancy: distrust of authorities	44	50
	lack of agency	16	47
	sequence of construction	73	40
	exploitation	12	32
	uncertainty or precarity	31	23
	tactics or strategy of MVP	43	22
	pipeline representatives	45	16
	economic mismatch betw. MVP and opponents	48	12
1c	Concerns and benefits for self, family, community, region, nation/world		
	environmental harm	8	106
	economic benefit	6	90
	economic harm	7	75
	harm to wells or water	10	48
	distance from pipeline	19	45

personal harm, danger, or risk	24	41
community harm	14	40
aesthetic harm	9	30
eminent domain	13	28
risk perception	65	28
pipeline explosion	18	26
community benefit, building community capital	17	22
easement	38	18
national or global harm	71	17
export of gas	15	15
family harm or conflict	37	15
displacement or NIMBY	33	14
misperception of risk, danger, or harm	23	13
regional harm	35	13
water quality issues	58	11
climate change	34	8
fracking	36	8
climate change	60	8
environmental benefit	63	8
geological harm, karst topography	11	5
safety benefit	64	5

2 Interpretation: Anchoring a novel event to a landowner's social history

2a Similar experiences

prior knowledge linked to similar event	59	112
history, personal or local	32	38
uncertainty or precarity	31	23
community benefit, building community capital	17	22
novel event	47	11
fracking	36	8
early experience of danger or disruption	49	8
powerline	2	2

2b Professional and occupational knowledge

professional or occupational expertise	20	63
early experience of danger or disruption	49	8

2c Spillover

opposition	1	62
history, personal or local	32	38
activist network	4	31
key player in network	39	17

spillover	3	14
3 Evaluation: Danger: Risk to persons and property		
3a Living in the blast zone		
rural values	69	85
perception of danger	51	71
distance from pipeline	19	45
personal harm, danger, or risk	24	41
pipeline explosion	18	26
uncertainty or precarity	31	23
misperception of risk, danger, or harm	23	13
3b Probabilistic thinking about danger		
perception of danger	51	71
professional or occupational expertise	20	63
distance from pipeline	19	45
personal harm, danger, or risk	24	41
pipeline explosion	18	26
uncertainty or precarity	31	23
misperception of risk, danger, or harm	23	13
early experience of danger or disruption	49	8
3c The dangers of rural life		
prior knowledge linked to similar event	59	112
perception of danger	51	71
professional or occupational expertise	20	63
Appalachian reference	27	14
early experience of danger or disruption	49	8
4 Evaluation: Disruption to people's sense of place		
4a Place dependence: generations of ties to the land		
rural values	69	85
harm to wells or water	10	48
history, personal or local	32	38
place dependence	29	26
sense of place	25	20
disruption to sense of place	28	15
4b Eminent domain as a disruption to place attachment		
environmental harm	8	106
place attachment	30	82

	economic harm	7	75
	emotional effects of the pipeline	26	64
	history, personal or local	32	38
	aesthetic harm	9	30
	eminent domain	13	28
	disruption to sense of place	28	15
	Appalachian reference	27	14
4c	Place identity: on the land and of the land; indigeneity		
	environmental harm	8	106
	emotional effects of the pipeline	26	64
	long-term outlook	54	48
	history, personal or local	32	38
	aesthetic harm	9	30
	early experience of danger or disruption	49	8
5	Response: Support, opposition, acquiescence, indifference		
5a	Support: ties to the economy and ideology		
	economic benefit	6	90
	political ideology	61	72
	political/legal strategy of MVP	41	65
	professional or occupational expertise	20	63
	comparing pipeline supporters and opponents	21	53
	misinformation	57	51
	eminent domain	13	28
	community benefit, building community capital	17	22
	tactics or strategy of MVP	43	22
	pipeline representatives	45	16
	export of gas	15	15
	support or approval of pipeline	62	13
	fracking	36	8
	climate change	60	8
5b	Support: ties to the social representation of danger and disruption		
	comparing pipeline supporters and opponents	21	53
	misinformation	57	51
	tactics or strategy of MVP	43	22
	pipeline representatives	45	16
	support or approval of pipeline	62	13
	water quality issues	58	11
	climate change	60	8
	safety benefit	64	5

	family support	75	1
5c	Opposition: ties to recreancy and activism		
	political ideology	61	72
	bad action by pipeline contractor	22	64
	opposition	1	62
	recreancy: distrust of authorities	44	50
	exploitation	12	32
	activist network	4	31
	tactics or strategy of opposition	42	31
	spillover	3	14
	support or approval of pipeline	62	13
	economic mismatch betw. MVP and opponents	48	12
	powerline	2	2
5d	Opposition: ties to the social organization of danger and disruption		
	prior knowledge linked to similar event	59	112
	perception of danger	51	71
	emotional effects of the pipeline	26	64
	pipeline explosion	18	26
	uncertainty or precarity	31	23
	disruption to sense of place	28	15
	misperception of risk, danger, or harm	23	13
	novel event	47	11
	early experience of danger or disruption	49	8
5e	Acquiescence and indifference		
	rural values	69	85
	acquiescence	55	43
	indifference	52	32
	Appalachian reference	27	14

Appendix C. IRB Determination Letter



Division of Scholarly Integrity and
Research Compliance
Institutional Review Board
North End Center, Suite 4120 (MC 0497)
300 Turner Street NW
Blacksburg, Virginia 24061
540/231-3732
irb@vt.edu
<http://www.research.vt.edu/siro/hrpp>

MEMORANDUM

DATE: August 7, 2020

TO: Shannon Bell, Michael D Hughes, Korine N Kolivras, Danielle Renee Mullins, Kelly L Scarff, Stephen Paul Gerus

FROM: Virginia Tech Institutional Review Board (FWA00000572, expires October 29, 2024)

PROTOCOL TITLE: Community Impacts of the Mountain Valley Pipeline

IRB NUMBER: 19-405

Effective August 7, 2020, the Virginia Tech Human Research Protection Program (HRPP) determined that this protocol meets the criteria for exemption from IRB review under 45 CFR 46.104(d) category (ies) 2(iii).

Ongoing IRB review and approval by this organization is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities impact the exempt determination, please submit an amendment to the HRPP for a determination.

This exempt determination does not apply to any collaborating institution(s). The Virginia Tech HRPP and IRB cannot provide an exemption that overrides the jurisdiction of a local IRB or other institutional mechanism for determining exemptions.

All investigators (listed above) are required to comply with the researcher requirements outlined at:

<https://secure.research.vt.edu/external/irb/responsibilities.htm>

(Please review responsibilities before beginning your research.)

PROTOCOL INFORMATION:

Determined As: Exempt, under 45 CFR 46.104(d) category(ies) 2(iii)
Protocol Determination Date: April 17, 2019

ASSOCIATED FUNDING:

The table on the following page indicates whether grant proposals are related to this protocol, and which of the listed proposals, if any, have been compared to this protocol, if required.

Invent the Future

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY
An equal opportunity, affirmative action institution

Appendix D. Concerns about the pipeline or pipeline project's effect on water

Note: These references to water concerns are directly from interviews; many references are redundant.

contamination of creek, well, and pond, in karst topography
contamination of water by pipeline coatings
contamination of spring water
concern with blasting that cracks the water table
ruining the mountain aquifer that runs into a municipal reservoir and a river
temporary siltation of creek after rain
illness from contamination by pipeline gas
vulnerability of sinkholes and karst to disturbance
loss of water supply to well
siltation of municipal reservoir
concerns for protecting the ecology of wetlands
contamination of domestic water sources
well water contamination by pipeline gas
fragility of karst geology and underground water
well contamination in karst areas, during excavation and backfilling
contamination of farm ponds
contamination of spring for domestic water
disruption/extinction of spring creek during construction
perception that spring water is superior to well water
threat to local commercial spring water facilities
recollection of diesel spill into a local public water facility
harm to strong aquifer
creek stopped running when construction started
mud washout made water undrinkable for neighbor's cattle
well dried up
no response after complaint to state water board
says MVP did water testing and water is OK
neighbor sold ranch because tap water turned brown and decreased water for farm animals
fought to improve their domestic water for years; MVP said they would mitigate water loss with Water Buffalos; not acceptable
harm to high quality spring water from aquifer
clear-cutting of pipeline route caused erosion that affected the course of their stream
disruption of aquifer risks upsetting wells and water that have tremendous volume, quality, and pressure
fears of water contamination post-construction in pipeline right-of-way
an explosion would contaminate the water supply
increased sedimentation that may or may not be caused by the pipeline project
potential for a pipeline break where it crosses the Greenbrier River, especially during floods