Backyard Voices: How Sense of Place Shapes Views of Large-Scale Energy Transmission Infrastructure

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Abstract

No matter how the U.S. sources its electricity in the future, expanding infrastructure capacity is inevitable. Reconfiguring or expanding the nation’s transmission infrastructure will require the engagement and guidance of the American public. It is thus critical to understand public perceptions of energy transmission infrastructure. While scholars have assessed the drivers of public views of electricity generation infrastructure such as wind farms and power plants, attention to transmission infrastructure has been limited. Moreover, despite the conventional wisdom that “Not In My Backyard” attitudes drive public opposition to infrastructure siting proposals, survey results suggest that more nuanced perceptions of project impacts drive public interpretation and evaluation of proposals. Thus, in this paper we explore how community members interpret and evaluate proposed transmission infrastructure projects. We draw from in-depth interviews with public officials, residents, landowners, and stakeholders in communities along the routes of two proposed energy transmission projects in the American midwest. We apply a framework rooted in social psychology to explain how the scale of place attachments and the symbolic meanings underlying place attachments help shape residents’ interpretations and evaluations of proposed projects as a threat or an opportunity.
1 Introduction

No matter how the U.S. sources its electricity in the future, expanding infrastructure capacity is inevitable. On average, the U.S. has seen the construction of 12,000 miles of natural gas pipelines each year since 1950 (Dooley et al. 2009), accumulating to over 2.5 million miles of transmission pipeline today (U.S. DOT Pipeline and Hazardous Materials Safety Administration 2018). This trend shows no signs of slowing. Declining natural gas prices and technological advancement have opened huge extraction opportunities, and many argue that inadequate transmission infrastructure is the limiting factor in getting this gas to market. Infrastructure development to meet this need is already underway. For example, five pipelines connecting to the Marcellus and Utica shales were scheduled for completion in 2017, with another five to open in 2018 (DiSavino, Scott 2017). Moreover, more than half of the nation’s pipelines are over 50 years old (Groeger 2012), and their replacements will not always be re-sited in their current locations. Meanwhile, the U.S. has 640,000 miles of high-voltage electric transmission lines, and the electricity transmission infrastructure is projected to grow by 6% by 2030 (U.S. Department of Energy 2015). Building a lower-carbon electricity system would necessitate further infrastructure expansion. For example, meaningful adoption of carbon capture and sequestration technology would require the construction of 11,000-22,000 miles of pipeline to transport CO₂ by 2030. (Dooley et al. 2009). Large-scale deployment of wind and solar-generated electricity requires either major advances in storage technology or an overhaul of the transmission system (MacDonald et al. 2016).

But reconfiguring or expanding the nation’s transmission infrastructure will require the engagement and guidance of the American public, since communities will be asked repeatedly to accept new transmission infrastructure. It is thus critical to understand public perceptions of energy transmission infrastructure, and how these perceptions are shaped by arguments from government, companies, and advocates. But while scholars have assessed the drivers of public views of electricity generation infrastructure such as wind farms and power plants, attention to transmission infrastructure has been limited.
In this paper, we expand on work assessing the drivers of public attitudes toward electricity generation facilities to explore perceptions of energy transmission infrastructure. We draw on in-depth interviews with public officials, residents, landowners, and stakeholders in communities along the routes of two proposed energy transmission projects to understand how community members view the projects. Our study complements survey-based studies of attitudes about energy infrastructure. We focus on a category of perceived impacts that survey researchers have identified as important drivers of public attitudes—socioeconomic considerations. Our analysis elucidates the sources of these perceptions.

We apply a framework rooted in social psychology to explain local attitudes about energy transmission infrastructure. The framework draws from social representation theory (Moscovici 2001, Batel and Devine-Wright 2015) and is centered around the concept of sense of place, which is composed of attachment, symbolic meanings, and satisfaction associated with a place (Stedman 2002). We show how the scale of place attachments (Devine-Wright and Batel 2017) and the symbolic meanings underlying place attachments (Devine-Wright 2009, Devine-Wright and Howes 2010, Bailey et al. 2016) help shape residents’ interpretations and evaluations of proposed projects as a threat or an opportunity.

The paper proceeds in four sections. First, we review prior work assessing attitudes about energy infrastructure and present our conceptual framework to assess the role of sense of place in shaping residents’ perceptions of energy transmission infrastructure (Section 2). Next, we describe our case sites and research methods (Section 3). In Section 4, we apply the framework in our cases. We describe patterns in the symbolic meanings and scale of attachments that comprise sense of place among our respondents. We show how respondents interpret project impacts through the lens of place sentiments, how these interpretations are rooted in familiar experiences, and how evaluations of the projects stem from the relationship between sense of place and interpretations of project impacts. We conclude in Section 5 with a discussion of the theoretical and practical implications of our findings.
2 Background and Conceptual Framework

2.1 NIMBY attitudes towards Infrastructure Siting

A large literature in planning and public policy assesses NIMBY—“not in my backyard”—attitudes towards infrastructure siting proposals. The NIMBY concept refers to attitudes of opposition to facilities such as power plants, industrial facilities, mental health facilities, or affordable housing projects in close proximity to one’s home, despite generalized support for these types of facilities (Schively 2007). This phenomenon has received some attention in the context of energy infrastructure siting, although scholars have primarily focused on electricity generation facilities (Ansolabehere and Konisky 2009, Wolsink 2000, 2007, Devine-Wright 2005, Swofford and Slattery 2010, Rygg 2012, Slattery et al. 2012, Carlisle et al. 2015, Greenberg 2009, Greenberg and Truelove 2011), nuclear waste disposal (Jenkins-Smith et al. 2011, Sherman 2012, Slovic et al. 1991), and oil and gas extraction sites (Michaud et al. 2008, Smith 2001, Boudet et al. 2014, Jacquet 2012, Paydar et al. 2016, Davis and Fisk 2014). Only recently have scholars begun to examine the NIMBY phenomenon in the context of transmission infrastructure (Gravelle and Lachapelle 2015). Moreover, scholars have returned mixed findings concerning whether proximity to infrastructure facilities is an important predictor of support (Gravelle and Lachapelle 2015, Greenberg 2009, Jenkins-Smith et al. 2011, Michaud et al. 2008, Johansson and Laike 2007, Krause et al. 2014, Swofford and Slattery 2010, Boudet et al. 2014, Carlisle et al. 2015).

These varied results may stem from differences in research designs, political and social contexts, or the types of infrastructure examined in each study. Moreover, few of these studies have directly assessed NIMBYism in its strict sense, defined as general support for infrastructure of a particular type but opposition when a project is proposed near one’s home. A recent study finds little support for strict NIMBYism in the energy infrastructure context. Instead, other considerations shape individuals’ views of infrastructure proposed for their communities. Relevant considerations include trust in energy companies, perceptions

To this end, another group of scholars has assessed more broadly the drivers of public support, opposition, and overall views of large-scale energy infrastructure projects. Scholars have coalesced around several key factors. These include concerns about socioeconomics, aesthetics, environmental impacts, health risks, planning and siting processes, and proximity to the infrastructure (Rand and Hoen 2017). Since negative and positive perceptions are not always associated with opposition to and support for energy projects (Groth and Vogt 2014, Walker et al. 2014b), it is important to understand which project attributes do tend to lead to support or opposition. However, this does not mean that building public support is as simple as, for example, promising community compensation, ensuring that a community will receive electricity from a proposed transmission line, or engaging the community early and often in siting decisions. This is because local residents interpret and evaluate project attributes in light of the values, meanings, and attachments that comprise sense of place (Devine-Wright 2009). On which project attributes should we focus our attention though?

2.2 Socioeconomic considerations shape attitudes towards energy infrastructure

Scholars have made socioeconomic considerations a primary object of study in assessing attitudes about energy infrastructure rand2017, and they have arrived at a consensus that socioeconomic impacts shape residents’ and stakeholders’ attitudes towards wind-energy in-
rastructure. For example, scholars have identified a strong perception that wind-energy development brings jobs to communities, and expected economic development has been linked with support for wind-energy development (Slattery et al. 2012, Bidwell 2013, Brannstrom et al. 2011, Larson and Kranich 2016). Likewise, perceived or expected property-value impacts are a major concern for residents living near proposed energy projects (Abbott 2010, Walker et al. 2014a), even though studies suggest this infrastructure has minimal or null effects on property values (Heintzelman and Tuttle 2012, Fast and Mabee 2015, Hoen et al. 2015, Lang et al. 2014). Advocates and opponents also tend to focus on economic concerns in their efforts to influence the outcomes of siting decisions (Brannstrom et al. 2011, Songsore and Buzzelli 2015). Due to the attention paid to them in scholarly and public discourse, we focus our analysis on perceptions of socioeconomic impacts. We do not argue, of course, that these are the only project attributes that matter to community members.

Socioeconomic considerations of interest include compensation to individual landowners or to communities; impacts to property values, tourism, electricity rates, and local economies; and concerns about distributive justice. There is wide variation in how individuals interpret these impacts though. For example, some scholars have found that compensation to landowners drives support for wind-farm developments (Mulvaney et al. 2013, Walker et al. 2014b) and gas drilling (Jacquet 2015, 2012). But individual-level compensation can also lead to conflict within communities, due to concerns about fairness in the distribution of these benefits (Fast et al. 2016, Baxter et al. 2013, Walker et al. 2014b, Brannstrom et al. 2011, Songsore and Buzzelli 2015). Some work has shown that European residents prefer public to private forms of compensation (García et al. 2016) and ownership (Toke et al. 2008) to address fairness concerns, but it is not clear that concerns about fairness in compensation predict attitudes about projects in North America (Baxter et al. 2013, Walker et al. 2014b). Nonetheless, concerns about public compensation including tax revenues do tend to structure debates about siting (Brannstrom et al. 2011).

In public discourse, supporters and opponents focus on different sets of economic con-
cerns in shaping their arguments for and against the infrastructure. Arguments in support of wind-energy development tend to focus on macro-level benefits like investment, revenue, and employment opportunities. Arguments against wind-energy developments focus on taxpayer burdens, increased electricity prices, inequity of access to economic opportunities and benefits, and scope issues like the temporary nature of jobs associated with developments (Songsore and Buzzelli 2015).

In sum, much prior work has focused on perceptions of socioeconomic factors. Scholars have found that socioeconomic considerations tend to drive views of electricity-generation facilities. And project developers, opponents, and supporters often focus on these aspects in public discourse. Building from this work, we focus on perceptions of socioeconomic impacts to explain distinctions between supporters’ and opponents’ perceptions and portrayals of project impacts. We address two important gaps in the literature. First, while most prior work has focused on electricity generation facilities, we examine views of transmission infrastructure. Our study can help to illuminate whether the real and perceived distribution of costs and benefits differs between generation and transmission facilities, and how these differences help to explain public views towards different components of the energy system. Second, the survey-based literature has focused on perceived socioeconomic impacts, but questions remain about what shapes these perceptions. This question forms the core of our analysis.

2.3 Sense of place shapes perceptions, representations, and responses to disruptions

Sense of place—a concept developed in social psychology—informs how residents interpret, evaluate, and portray potential disruptions such as, in our cases, energy transmission infrastructure. Sense of place is composed of three related concepts: (1) symbolic meanings form the bases for (2) attachment, and both of these contribute to some level of (3) satisfaction associated with a “spatial setting” (Stedman 2002, p. 563). Symbolic meanings are “de-
scriptive statements, rooted in symbols about ‘what kind of place this is’ (Stedman 2002, p. 564). Meanings are symbolic in the sense that they are expressed in terms of physical attributes of locations. Some have conceptualized meanings as cognitive constructs (Stedman 2002), while others argue that meanings are comprised of both cognition and emotion (Devine-Wright 2009). We adopt the latter definition: the meanings associated with place are imbued with both thinking and feeling and expressed through symbols. All settings hold multiple meanings, and symbolic meanings associated with a place vary across individuals.

Symbolic meanings form the basis for place attachment and place satisfaction. Place attachment is a “bond between people and their environment” (Moore and Graefe 1994, Williams et al. 1992, Stedman 2002). Symbolic meanings are the “building blocks” of attachment (Bem 1970): people become attached to places through attributing meaning to them. Attachment is also a form of identity since people begin to define themselves in terms of a place, through interacting with the place and imbuing it with meaning. One intuitive way to distinguish between symbolic meanings and place attachment is to think of symbolic meanings as expressions of what a place means to a person, whereas attachment is a measure of how much it means (Bem 1970, Stedman 2002). Place satisfaction is an overall attitude, analogous to a feeling thermometer, and it also stems from symbolic meanings. Satisfaction is a “multidimensional summary judgement of the perceived quality of a setting” (Stedman 2002, p. 564)(Ladewig and McCann 1980, Mesch and Manor 1998). Together, symbolic meanings, place attachment, and place satisfaction comprise sense of place.

Devine-Wright (2009) combines sense of place with elements of social representations theory (Moscovici 2001), to explain how sense of place shapes the way in which people interpret, evaluate, portray, and act towards proposed changes in their communities. The framework, depicted in Figure 1, assumes a disruption, which is a proposed or actual change to a place. Individual and social responses to the disruption unfold in four stages: awareness, interpretation, evaluation, and coping (Devine-Wright 2009). In the first phase, community members become aware of the proposed disruption. This information-gathering process is
mediated by communication with trusted individuals, the media, project developers, and other interested stakeholders. Second, using anchoring and objectification, individuals interpret the change; they try to make sense of its implications for their world. Anchoring is the process by which people link new information to familiar knowledge. Objectification is the process by which people make abstract concepts concrete (Moscovici 2001). Of course, the links that people make between the unfamiliar and the familiar are indelibly shaped by the composition of the familiar. Thus, in Devine-Wright’s (2009) framework for assessing responses to place disruptions, the symbols and symbolic meanings that comprise sense of place provide the source material from which individuals draw in anchoring and objectifying disruptions. For example, someone who feels attachment to a farm community may develop expectations about an unfamiliar disruption by analogy to elements of her experiences as a farmer.

In the third phase, people draw on their interpretations of proposed changes to evaluate them as threats or opportunities. To continue our example, the farmer will evaluate the disruption in light of its implications for farming. If people interpret a change as place-enhancing, they will evaluate the change positively. If they interpret a change as place-threatening, they will evaluate it negatively. These evaluations depend on symbolic meanings associated with the place itself—the substance of place attachments—and interpretations of proposed changes in light of these symbolic meanings. Finally, in the coping phase, individuals may respond with actions of resistance to or support for the change. The decision to act and the direction of action depend on evaluation of the change as a threat or opportunity in light of an individual’s sense of place.
This figure, adapted from (Devine-Wright 2009), depicts how sense of place shapes social responses to community disruptions. The figure depicts five stages: knowing, interpreting, evaluating, coping, and acting. The present analysis focuses on stages two and three: interpretation and evaluation.

2.4 Sense of place shapes perceptions of energy infrastructure projects

Scholars have studied these concepts in the context of electricity generation infrastructure, in three main ways. First, without explicitly invoking the framework articulated here, energy scholars have noted that place-related values, identities, attachments, and meanings help explain responses to energy facility siting proposals (Pasqualetti 2011, Ferguson-Martin and Hill 2011, Bidwell 2013, Hirsh and Sovacool 2013, Phadke 2013, Petrova 2013). Second, scholars have explicitly used elements from Devine-Wright’s (2009) framework to show how social representation, symbolic meanings, and place attachments shape responses to facility siting proposals. These studies first gauge the meanings that survey respondents assign to their communities. Examples of meanings include environmental health, economic decline, tourism, wilderness, or friendliness (Jacquet and Stedman 2013, Devine-Wright and Howes 2010, Bailey et al. 2016). Then, scholars show how residents interpret proposals (through anchoring and objectification) and evaluate them in light of their place attachments. For example, community members may anchor a proposed wind farm by comparing turbines’
height to an industrial tower. These individuals would interpret the wind farm as “industrializing.” Residents who view their community as touristic—a symbolic meaning—are likely to evaluate this “industrializing” interpretation as a threat. Conversely, those who view their place as economically struggling might evaluate the industrializing wind farm as an opportunity (Devine-Wright and Howes 2010). Opposition and support hinge on contradictions between symbolic representations of a place and project impacts, as interpreted through anchoring and objectification (Devine-Wright and Howes 2010, Bailey et al. 2016, Devine-Wright 2009).

Third, scholars have assessed whether the scale of place attachment shapes acceptance of energy infrastructure. In these studies place attachment is generally operationalized separately from symbolic meanings. Scholars ask respondents to what extent they feel a sense of connection or belonging to their communities (Jacquet and Stedman 2013), the nation, or the world (Devine-Wright and Batel 2017). They then assess whether feelings of attachment to place drive attitudes about infrastructure developments. Findings are mixed, perhaps because the concept of place attachment is imprecise and abstract as a survey item when it is separated from the symbolic meanings underlying it. We argue that the content of symbolic meaning is an important component in the link between place attachment and views of disruptions. In our case sites, almost all respondents expressed place attachment, but their perceptions of project impacts and their overall attitudes toward the proposals varied widely. Assessing the content of place attachments—and not simply gauging their existence or their geographic scale—helps explain these differing perceptions. Assessing both the scale and content of place attachments is essential to implementing Devine-Wright and Batel’s (2017) suggestion to explore the relationship between the spatial component of project impacts and place attachments at multiple scales.
3 Methods and Data

We apply this framework to assess how sense of place shapes perceptions of two proposed long-haul energy transmission projects in the American Midwest. We chose our case sites to two important criteria. First, we paid particular attention to the timing of our data collection and selected projects that were still in the planning stages. Neither project had been approved when we conducted our interviews. This timing distinguishes our study from prior work gauging public views after project completion. We explore anticipatory interpretations and expectations, rather than perceptions that are shaped by the end product or have had time to weaken in intensity. Second, the cases differ in the type of infrastructure proposed. One of the projects is a proposed natural gas pipeline, and the other is a high-voltage transmission line proposed to transmit wind-generated electricity. This variation allows us to compare perceptions of different energy sources and physical attributes. Third, both projects are designed primarily for transmission through, rather than distribution to, the communities they will cross. This characteristic distinguishes transmission from generation facilities and attitudes may differ between these types of projects.

Our data consist of semi-structured interviews with county government officials; stakeholders such as representatives of unions, farm bureaus, businesses, and environmental groups; and community residents whose properties the projects would or would not cross. We focused our interviews around two broad questions that we introduced in Section 2 as queries of interest to scholars and practitioners. How do community members and stakeholders evaluate the socioeconomic aspects of large-scale energy infrastructure projects, and how do perceptions of siting processes shape their evaluations? We used a semi-structured interview approach (Weiss 1994). This means we used an interview guide to ensure that we covered a core set of topics with each respondent, but we allowed flexibility in the conversation so that respondents could raise concerns and perspectives we may not have asked about. We adapted a template interview guide for each respondent, and this template is included in the Appendix. One of the authors conducted the interviews, and all interviews
were conducted in person.

We used a snowball sampling technique to identify interview respondents in each case site. We identified initial contacts through media reports, the websites of relevant stakeholder groups, and county government websites. We then arranged additional interviews with individuals recommended by these initial contacts. In total, we interviewed 31 individuals across the two project sites. Table 1 shows the roles of our interview respondents across the two cases.

<table>
<thead>
<tr>
<th>Description</th>
<th>Project</th>
<th># of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local official (elected)</td>
<td>Pipeline</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Power Line</td>
<td>7</td>
</tr>
<tr>
<td>Local official (unelected)</td>
<td>Pipeline</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Power Line</td>
<td>2</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Pipeline</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Power Line</td>
<td>2</td>
</tr>
<tr>
<td>Resident</td>
<td>Pipeline</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Power Line</td>
<td>7</td>
</tr>
<tr>
<td>Developer</td>
<td>Pipeline</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Power Line</td>
<td>1</td>
</tr>
</tbody>
</table>

We subjected our interview data to several rounds of qualitative coding. In the initial coding we categorized and organized responses based on the structure of our interview protocol and initial research questions. This round of coding helped us to identify commonalities and differences in respondents’ perceptions of project attributes on a variety of dimensions, the implications of these attributes as individual- or community-level costs or benefits, and overall evaluations of the projects. The focus on sense of place and social representations of disruptions emerged through this first round of coding, because we were struck by the extent to which respondents relayed their perspectives using comparisons, memory, and narrative. The emotional tone of interviews varied widely, as did the setting, characters, storylines, and analogies respondents incorporated into the conversation. It was clear that individuals were using elements of their social and individual experiences to interpret, assess, and ultimately evaluate these proposed disruptions to their communities.
After this initial round of coding, we developed the framework and a coding protocol to systematically assess how social and individual experience informs respondents’ perspectives. We used the coding protocol to identify instances of anchoring, objectification, and expressions of place sentiments. Moscovici (2001) identifies two types of common anchoring moves, and we coded the interviews accordingly. First, respondents categorize by *naming* the project or some aspect of it. For example, they might call it a “land grab” (naming the project itself), or they might name damage to agricultural activities as a concerning characteristic. Second, they *compare* the project to a familiar prototype. For example, many respondents compare the power line to pipelines, and this comparison informs their expectations regarding disruption to farmland. In the process of coding, we found that we needed more than just these two moves to describe the anchoring process. We add *metaphor* and *memory* to the ways in which people anchor new experiences. The distinction between metaphor and prototypical comparisons is subtle, as they are both forms of comparison. We classify a comparison as a metaphor if a person uses the comparison to illustrate an aspect of the project without claiming that the analog is a prototypical example of a class. For example, a respondent might compare the height of a transmission tower to the height of a football stadium, but this is not a claim that the tower *is* a stadium. By contrast, a prototypical comparison makes a classification claim. For example, many respondents compare the merchant developer that proposed the transmission line to traditional utilities. Respondents then argue that these entities do or do not belong in the same class, and by extension that they should or should not be subject to the same permitting procedures.

The ways in which people discuss the projects reveal the abstract values and principles that matter to them, how they had objectified these values ex ante, and how they apply them to the current situation. We identify instances of objectification by coding for values that respondents reference in discussing project impacts and their evaluations of the projects. The strong presence of memory and analogy in portrayals of the projects suggests that prior experiences are heavily weighted in objectification, but the projects themselves also
shape the way in which people define abstract concepts, values, and principles. We do not adjudicate between ex-post and ex-ante processes of objectification, since our interest is in identifying the values that respondents apply. We identify the objectified concepts that matter to community members in our study sites and explore how they apply them to energy transmission infrastructure.

Respondents interpret project impacts through the lens of familiar experiences and evaluate them according to objectified values and principles. This means that respondents invoke abstract concepts, such as need or distributive justice, in the same passages in which they anchor disruptions to their familiar experiences. Throughout the coding process we paid close attention to the links between anchors and objectifications, and we coded segments of the interviews according to the following scheme:

- Unfamiliar aspect of the project (“disruption” (Devine-Wright 2009))
- Concrete association (anchor)
- Type of anchoring move (naming, comparison to prototype, memory, or metaphor)
- Value, principle, or other abstract concept explicitly or implicitly referenced (objectified abstraction)

For example, one opponent of the power line project makes the following comparison between the transmission line proposed for his community and a similar power line that had been approved nearby:

Well, it was moving electricity in Illinois from one spot to another spot in Illinois. I assumed they needed it. Ameren is an electric company. They build lines all the time. If they’ve got one person that wants to build a house out here, they build a line here to that person’s house. That’s their purpose is just to buy electricity....They’re serving the people of Illinois....if you actually need electricity, you’ve got to move it somehow.

We coded this excerpt in the following manner:
We also coded the interviews for evidence of sense of place: symbolic meanings and place attachments. These reveal themselves both through respondents’ general portrayals of their communities and through their depictions of the relationship between the projects and their communities. Following Stedman’s (2002) argument that symbolic meanings form the basis for place attachments, we coded segments of the interviews wherein respondents invoked some concrete symbol, its meaning, and the time- and/or geographic scale of place attachment associated with the symbolic meaning. For example, one respondent depicts his community’s landscape this way:

We have power lines all over the place and I’ve been raised with that and we have a substation where I was raised. My parents’ house was less than 350 feet from a substation....The school bus route came along there from when I was in grade school and we’d walk from the house across a railroad track bed to the school bus stop at the substation. I can tell you today if I drove by that road every day I’m not for sure I could tell you whether the gate was open on that fenced-in substation or not, or if there was any wires to it. I don’t see it anymore because I’ve seen it every day. You may have rooms in your house that you don’t know....You see them so many times. You see them every day unless somebody drastically moves a cabinet or something, you probably don’t see that cabinet any more. It’s there and you see it but it doesn’t click.

The symbols invoked here include power lines, a substation, and (through analogical reasoning) rooms in a home. The symbolic meaning they convey is that of a rural-industrial landscape, and this meaning contributes to and reflects place attachment at the local scale.

We coded this excerpt in the following manner:

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
<th>Scale of place attachment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power lines</td>
<td>rural-industrial</td>
<td>present</td>
</tr>
<tr>
<td>Substation</td>
<td>rural-industrial, ordinary</td>
<td>past</td>
</tr>
<tr>
<td>Rooms in a home</td>
<td>ordinary</td>
<td>present</td>
</tr>
</tbody>
</table>

Using this coding process we extract the symbolic meanings expressed by the residents we talked with, describe the interpretations and evaluations they present when discussing
the projects, and show how these two sets of concepts are related. We focus our analysis on community- and individual-level socioeconomic considerations and show how evaluations of the projects stem from contradictions and complementarities between sense of place and interpretations of project impacts.

4 Analysis: How Sense of Place Informs the Interpretation and Evaluation of Energy Transmission Infrastructure

Our primary question is how symbolic meanings and place attachments shape interpretations and evaluations of the proposed disruptions to our case communities. Descriptively, we can begin to answer this by asking whether and how symbolic meanings and place attachments expressed by supporters and opponents are similar and different. Tables 2 and 3 provide a sense for the similarities and differences in the symbolic meanings and geographic scales of place attachments expressed by respondents who support and oppose the projects. Table 2 shows the percentage of supporters and opponents that communicate the meanings expressed most frequently. Table 3 shows the frequency with which we applied these codes across transcripts and thus provides a sense for the intensity with which respondents express each meaning.\(^1\) For example, among excerpts from pipeline project opponents’ transcripts that we coded as indicating scale of place attachments, we used the code “local” 92% of the time. Pipeline project supporters invoke views of their communities as energy producers in 58% of the excerpts we coded as conveying symbolic meanings. These tables convey aggregate patterns in place attachments and symbolic meanings among supporters and opponents.

\(^1\)Table 3 includes some meanings that are not included in Table 2, because they are expressed with low intensity or by only one respondent.
Table 2: Scale of Place Attachments and Symbolic Meanings: Respondent Frequencies

<table>
<thead>
<tr>
<th>Code</th>
<th>Pipeline Oppose (%)</th>
<th>Pipeline Support (%)</th>
<th>Power Line Oppose (%)</th>
<th>Power Line Support (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>geographic scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>global</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>local</td>
<td>100</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>national</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>state/regional</td>
<td>25</td>
<td>100</td>
<td>50</td>
<td>67</td>
</tr>
<tr>
<td>meaning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>autonomous</td>
<td>NA</td>
<td>NA</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>history</td>
<td>33</td>
<td>80</td>
<td>25</td>
<td>56</td>
</tr>
<tr>
<td>home</td>
<td>67</td>
<td>40</td>
<td>50</td>
<td>33</td>
</tr>
<tr>
<td>nature</td>
<td>67</td>
<td>40</td>
<td>38</td>
<td>11</td>
</tr>
<tr>
<td>producer</td>
<td>33</td>
<td>100</td>
<td>100</td>
<td>89</td>
</tr>
<tr>
<td>agriculture</td>
<td>33</td>
<td>80</td>
<td>100</td>
<td>56</td>
</tr>
<tr>
<td>commerce/industry</td>
<td>0</td>
<td>80</td>
<td>13</td>
<td>67</td>
</tr>
<tr>
<td>energy</td>
<td>0</td>
<td>100</td>
<td>38</td>
<td>22</td>
</tr>
<tr>
<td>progress/modernity</td>
<td>0</td>
<td>100</td>
<td>0</td>
<td>44</td>
</tr>
<tr>
<td>resilient</td>
<td>NA</td>
<td>NA</td>
<td>25</td>
<td>11</td>
</tr>
<tr>
<td>rural-industrial</td>
<td>0</td>
<td>80</td>
<td>25</td>
<td>33</td>
</tr>
<tr>
<td>service</td>
<td>NA</td>
<td>NA</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>suburban</td>
<td>67</td>
<td>20</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>vulnerability</td>
<td>33</td>
<td>40</td>
<td>50</td>
<td>44</td>
</tr>
<tr>
<td>poverty</td>
<td>33</td>
<td>40</td>
<td>25</td>
<td>11</td>
</tr>
</tbody>
</table>

This table shows the percentage of project supporters and opponents in each case site who express each symbolic meaning. Some meanings are not expressed by any respondents for one of the sites; these are reflected as "NA" values.
### Table 3: Scale of Place Attachments and Symbolic Meanings: Code Frequencies

<table>
<thead>
<tr>
<th>Code</th>
<th>Pipeline Oppose (%)</th>
<th>Pipeline Support (%)</th>
<th>Power Line Oppose (%)</th>
<th>Power Line Support (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>national</td>
<td>0</td>
<td>21</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>national</td>
<td>0</td>
<td>21</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td>local</td>
<td>92</td>
<td>49</td>
<td>90</td>
<td>76</td>
</tr>
<tr>
<td>local</td>
<td>92</td>
<td>49</td>
<td>90</td>
<td>76</td>
</tr>
<tr>
<td>global</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>state/regional</td>
<td>8</td>
<td>72</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>progress/modernity</td>
<td>0</td>
<td>31</td>
<td>0</td>
<td>18</td>
</tr>
<tr>
<td>capitalist</td>
<td>NA</td>
<td>NA</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>history</td>
<td>5</td>
<td>13</td>
<td>8</td>
<td>11</td>
</tr>
<tr>
<td>home</td>
<td>27</td>
<td>5</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>law and order</td>
<td>NA</td>
<td>NA</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>nature</td>
<td>23</td>
<td>3</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>outdated</td>
<td>NA</td>
<td>NA</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>producer</td>
<td>14</td>
<td>69</td>
<td>66</td>
<td>52</td>
</tr>
<tr>
<td>agriculture</td>
<td>14</td>
<td>19</td>
<td>55</td>
<td>34</td>
</tr>
<tr>
<td>commerce/industry</td>
<td>0</td>
<td>10</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>energy</td>
<td>0</td>
<td>58</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>autonomous</td>
<td>NA</td>
<td>NA</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>resilient</td>
<td>NA</td>
<td>NA</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>rural-industrial</td>
<td>0</td>
<td>21</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>suburban</td>
<td>36</td>
<td>2</td>
<td>NA</td>
<td>NA</td>
</tr>
<tr>
<td>service</td>
<td>NA</td>
<td>NA</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>steward</td>
<td>NA</td>
<td>NA</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>underdog</td>
<td>NA</td>
<td>NA</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>unified</td>
<td>NA</td>
<td>NA</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>vulnerability</td>
<td>9</td>
<td>11</td>
<td>21</td>
<td>16</td>
</tr>
<tr>
<td>poverty</td>
<td>9</td>
<td>8</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

This table shows the frequency with which we used each symbolic meaning code for each project, and thus provides a sense of the frequency and intensity with which respondents identify various meanings with their communities. Each cell reflects the percentage of total symbolic meaning code applications that were applied to each code. “NA” values indicate that no respondents express a particular geographic scale or symbolic meaning in the interviews.

Broadly, the symbolic meanings that surface most often during our interviews fall into three categories: economic identities, aesthetic characteristics, and trajectories. Economic identities include vulnerability or poverty and production-related meanings including farming, commerce and industry, or energy production. Aesthetic characteristics include descrip-
tions of a place as home, suburban, natural, or rural-industrial. Trajectories convey a sense of history or progress and modernization.

Table 4 depicts the relationships between elements of place attachment, the familiar experiences respondents use to make sense of the projects, perceived impacts, the values respondents use to evaluate impacts, and evaluations of the projects as place-threatening or place-enhancing. The table summarizes the links at the heart of the analysis.
Table 4: Sense of Place, Interpretation of Impacts, and Evaluation of the Projects

<table>
<thead>
<tr>
<th>Sense of Place / Scale of Place Attachment</th>
<th>Anchor</th>
<th>Perceived Impact and Objectified Value</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Identities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local, national, progress and modernity</td>
<td>aging power lines</td>
<td>benefit, need: upgrade grid</td>
<td>opportunity</td>
</tr>
<tr>
<td></td>
<td>local electrification</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HVDC power lines in NY</td>
<td>safety: low safety risk</td>
<td></td>
</tr>
<tr>
<td>Industry and commerce, trajectory of decline and recovery</td>
<td>manufacturing jobs</td>
<td>benefit: future jobs, manufacturing recovery</td>
<td>opportunity</td>
</tr>
<tr>
<td>Agriculture, trajectory of decline and recovery</td>
<td>land prices, crop prices, 1980s farm crisis</td>
<td>benefit: compensation payments as land “rents”</td>
<td>opportunity</td>
</tr>
<tr>
<td>National, agriculture</td>
<td>electricity provision, food provision</td>
<td>service: grid expansion</td>
<td>opportunity</td>
</tr>
<tr>
<td>Local, agriculture</td>
<td>local distribution lines</td>
<td>need: local electricity</td>
<td>threat</td>
</tr>
<tr>
<td>Agriculture, trajectory of hard-fought progress</td>
<td>“traveling circus” of construction jobs</td>
<td>(non) benefit: non-local, temporary jobs</td>
<td>threat</td>
</tr>
<tr>
<td></td>
<td>power poles obstructing fields</td>
<td>cost, distributive justice: inconvenience to farmers, lost value of farmland</td>
<td></td>
</tr>
<tr>
<td>Agriculture, energy</td>
<td>oil and gas extraction</td>
<td>benefit, need: expanded oil and gas development</td>
<td>opportunity</td>
</tr>
<tr>
<td></td>
<td>oil and gas well site training programs</td>
<td>benefit: pipeline construction jobs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>negotiation with developers</td>
<td>benefit: generous compensation to landowners</td>
<td></td>
</tr>
<tr>
<td>Local, state, national, energy</td>
<td>oil and gas extraction</td>
<td>security: independence from foreign oil and gas</td>
<td>opportunity</td>
</tr>
</tbody>
</table>

Community aesthetics

| Suburbs, nature, home | pipeline construction process | cost: damaged natural areas | threat |
|                       | property devaluation          | community cost: tax revenues decline |            |
|                       |                               | individual cost: property values decline |            |
| Rural-industrial      | power lines, substation, pipelines | (non) cost: no decline in property values | opportunity |
|                       |                               | benefit: tax revenues increase |            |
|                       |                               | benefit: cut property tax rates |            |

This table shows the symbolic meanings and anchors through which respondents perceive project impacts and evaluate them as threats or opportunities.
Scale of Place Attachments

All of our interview respondents—including supporters, opponents, and those who express neutral evaluations of the projects—convey local place attachments. This provides support for the argument that understanding multi-scalar place attachments is critical to explaining the relationship between sense of place and evaluation of community disruptions (Devine-Wright and Batel 2017). It is too simplistic to argue that those who feel a sense of place attachment are the most likely to oppose infrastructure proposals. Instead, the geographic scale of place attachments interacts with symbolic meanings to inform interpretation of particular project impacts. Geographic scale is also an important distinguishing feature of the objectified values that respondents use to evaluate the projects. Thus, before proceeding to the discussion of symbolic meanings, we introduce how the scale of place attachments informs the ways in which respondents objectify the values and principles through which they evaluate the projects.

The scale of place attachment is an important determinant of how respondents objectify the concept of “need.” In both cases, only supporters express national-scale place attachments, and they often justify their support for the project in terms of national or state-scale place attachments. A county commissioner on the power line route remarks, “We’re all three [county commissioners] of the opinion that the infrastructure of the electric transmission in the United States is ancient and needs to be upgraded....Infrastructure is important if the nation is going to grow.” This respondent assigns meaning to national electricity needs and sees the project as an opportunity to better meet those needs. He also links national and even global place attachment back to his community. He continues:

I just saw on television one of the politicians talking, that the reason people are poor in other parts of the world is because they don’t have electricity. Electricity has been the finest gift to the humans that you can imagine. As a little boy I grew up without electricity and...To me, why would anybody protest? There’s electric lines going across my, it was at the time my great-grandfather’s property and he gave the right of way he was so happy to have electricity in the area. Now we’re griping about not getting enough money.
This respondent links his own experience from childhood with national and even global electricity needs. He expresses a value of progress defined in a geographically nested way, and evaluates the project as an opportunity to advance national and local progress.

The same experience that informs sense of place also shapes respondents’ interpretation of project impacts. In the quote above, the commissioner contrasts his grandfather’s experience—receiving no compensation for a power line crossing his property—to the compensation offered by the power line developer. He interprets the compensation currently offered as generous by comparison. He also bases his perception of the nation’s electricity needs on his career experience: “I traveled the entire United States working on [power lines]. Our infrastructure is ancient. A lot of the newest stuff out there was put in place in 1972, I mean it’s old.” In assessing the risk associated with high-voltage direct-current (HVDC) technology, he also draws from this experience:

The people here said, “Well this is something new, 500,000 volts of direct current, it’s never been done. They don’t know what it’s going to do to people, and livestock, and chickens, and children, and school buses.” But the fact of the matter is there’s been a 500,000 volt DC line running from the Niagara Falls area to New York city for many years.

He dismisses opponents’ claims that HVDC technology poses health and safety risks, based on his exposure to HVDC and his view that it is a well-proven technology. This respondent’s experience provides the evidence for his interpretation of project impacts. It also shapes his sense of place, which then serves as a lens through which he evaluates the project.

Some power line supporters reveal a geographically nested objectification of service as a value that is central to their perception of their community’s identity. They assert that it is the community’s duty (and opportunity) to support the project as a contribution to the greater good. One respondent expresses the sentiment this way:

I think it’s almost a little patriotic for me to be able to provide to people that we’re not only providing their food, we’re not only able to provide them quality product for them to eat, but we’re also able to help them to have electricity, to have energy, that that’s something that we are able to provide here in rural Missouri that they can’t do in the cities because it’s just not feasible.
Several other respondents invoke similar definitions of service in explaining their support for the power line or in describing their community. A nested conceptualization of progress and service and multi-scalar place attachments are consistent with a view of the project as an opportunity to facilitate progress for the state, region, or nation.

A similar pattern emerges in the pipeline case. In addition to focusing on “need” and “progress,” respondents often invoke a value of security defined at the national level to explain their view of the pipeline as an opportunity. One respondent explains, “I am a firm believer that we need to be independent of foreign oil. What do we fight these wars over at the end of the day? It is generally oil and to do that, I think it is going to save our nation, it really is.” He continues by arguing that pipelines are the safest, most reliable technology for facilitating the export of oil and gas from the Marcellus and Utica shales. He also links national security with regional and local impacts, musing, “I wish I was 20 years younger so I could see the impact on this region in the next 20 years as we become truly independent of foreign oil and the economic activity that is going to be ongoing with the Utica and the Marcellus.” The respondent’s exposure to the energy industry shapes his sense of place: he draws meaning from the local oil and gas industry. The pipeline presents an opportunity to expand gas extraction, enhancing both this source of local meaning and national security. Thus, his sense of place tied to energy production contribute to the view of the project as an opportunity for both the nation and the region.

Conversely, the exclusively local place attachments expressed by many opponents grounds the criteria they use to evaluate the projects. This is particularly evident in the power line case, where respondents evaluate the project in terms of geographically defined need. Opponents contrast the project with existing power lines, railroads, and highways, arguing that the critical distinction with these other types of infrastructure is that they all serve a local need. One opponent declares, “This RTO was not ... Doesn’t need the energy [from the transmission line]. We have plenty of cheap abundant electricity as it is and we’re also utilizing wind energy right here in Missouri, that we make here in Missouri.” Another
compares the proposal to a recently constructed transmission line: “Well, it was moving electricity in Illinois from one spot to another spot in Illinois. I assumed they needed it. Ameren is an electric company....They’re serving the people of Illinois.” Supporters are also aware of this distinction, but they often invoke a more abstract definition of “public good,” or they express place attachments encompassing the state, region, nation, or future. This layered place attachment informs their conception of “need” as extending beyond the immediate needs of their community or even state.

Symbolic Meanings

Examining the symbolic meanings underlying place attachments, Tables 2 and 3 show that both supportive and opposing respondents identify with their places as agricultural producers, and they highlight community-level vulnerability or poverty. The latter pattern comports with findings that local economic quality is not a significant independent predictor of support or opposition to infrastructure projects (Konisky et al. 2018). Instead, sentiments of community vulnerability interact with other symbolic meanings underlying productive identities to shape perceptions and evaluations of project impacts. Opponents of both projects more often express place sentiments relating to nature, home, and respite; and to express economic identities rooted exclusively in agricultural production. Supporters commonly view their communities as rural-industrial landscapes and highlight commercial and industrial productivity, progress and modernity, or energy production.

Meanings underlying production-related place attachments shape the way in which respondents interpret and evaluate the projects’ economic impacts. In general, supporters and

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2This frequency appears slightly lower among power line supporters, in part because two project supporters were stakeholders associated with labor and environmental groups, and not local to the communities where the projects were proposed.

3The prevalence of farm-related place sentiments appears lower among pipeline opponents, but it is important to note that all pipeline opponents who express production-related place sentiments express sentiments associated with farming. We talked with a few pipeline opponents from suburban communities, whose place sentiments were not related to production at all but instead to aesthetic characteristics. This is an example of how the objective differences between places constrain the possibilities for interpretation of impacts through the lens of sense of place (Van der Horst 2007)
opponents differ in whether farming features as the only source of economic identity. A respondent in the power line case exemplifies a dualistic sense of place infused with a narrative of arrested decline. She expresses nostalgia for her town’s identity as an industrial producer:

If you were to look at us 30 years ago, we had a manufacturing plant here for GE, for General Electric...There was a Simco and they did a lot of welding, and they did a lot of production of I’m not sure exactly what specifically they produced, but had a lot of welding, they had a lot of trades jobs....We’ve lost so many manufacturing jobs that there’s really, unless you are attached to the local government or the school or you’re doing something that supports the agriculture industry here, there aren’t many jobs.

She also draws meaning from her community’s identity as an agricultural producer, and expresses a similar narrative of decline. She recalls farmers’ struggles during the 1980s farm crisis:

My husband’s family, they lost their farm in the ’80s because of high interest rates and restructuring of banks, and a lot of different things happened during that time. But in order to keep from going completely bankrupt, they sold all of their land. They sold most of their equipment. My father-in-law was able to keep the 200 acres where we live because it wasn’t incorporated into their corporation, it was on its own.

Informed by this memory, she sees farmers as teetering again: ‘Profit margins and row crop production are razor thin right now. For instance, last year we wouldn’t have had any income over being able to make the payments...Some of the stuff is kind of starting to snowball the same way they did in the early ’80s to lead to the crash like in the mid-’80s.”

Other respondents also invoke symbols suggesting a narrative of decline, including job loss, out-migration, school district budget shortfalls, and dwindling county budgets.

When viewed through a context of industrial and agricultural decline, the project represents an opportunity to hedge against individual vulnerability and recover lost manufacturing activity. This respondent—along with most others—recognizes that jobs associated with the power line would be temporary and may not go to local workers. Even so, she views the project as an opportunity to revitalize the community’s manufacturing identity:

They’re not going to affect us here in the county because that would be probably close to an hour and 20 minute drive every day for someone...But no, that’s
not really a concern to me that they would be temporary because hopefully this industry continues to build and transmission continues to improve and expand and they’re able to continue building up, those temporary jobs become permanent and they’re able to get more jobs.

This trajectory of future growth fits into the narrative of decline and recovery that she uses to describe her community. Likewise, she sees opportunity in compensation to farmers whose properties are directly impacted by the line. She explains:

Having that additional revenue [compensation from the power line] is really big. One of the things that’s really neat about farmers and agriculturalists, is when we have extra money in our pockets it’s most likely going to stay local. We’re going to buy more cows, it means we need to buy more feed, so that keeps the individuals employed at the feed mill. It’s really a trickle down system to where, maybe we’ll buy another tractor or we may upgrade equipment.

In her view, transmission infrastructure represents an opportunity for land to “multitask” in its productive capacity, as grazing land and a rent generator. Her sense of place is rooted in manufacturing decline, farmers’ vulnerability, and memories of agricultural decline and feeble recovery. The project complements these meanings; she views it as an opportunity to hedge against crop and land price fluctuations and bring back local manufacturing. For this respondent and others, a narrative of community decline supports evaluation of the project as an opportunity to ensure the continuation of local services, replenish county coffers, and support local service-industry or construction businesses.

In the pipeline case, those who express dual place sentiments associated with agriculture and energy production also tend to perceive the project as an opportunity from individuals’ and communities’ perspectives. These respondents do not deny that pipeline installation and even operation would impact farms’ productivity, temporarily or permanently. Instead, they assert farmers’ rights to demand respectful treatment of their property, receive fair compensation for lost productivity, and maintain legal counsel to ensure fair outcomes in negotiation with the developer. If they take these steps, the project can be a “win, win, win” for landowners, communities in the region, and the nation. One respondent works with farmers and local officials negotiating with the pipeline developer. Describing easement
negotiations, he explains:

I also tell farmers too is this, is that your easement agreement is the work order....Engineers and construction companies understand work orders, which means have the work order for the project on your farm written into the easement. There’s no questions asked when you do that....When you start backing up with cold, hard, factual data and this is why this price cannot be at $30 a foot, but it needs to be at least $90 a foot, just to make me whole. Those companies start paying attention.

Respondents sometimes compare the developer with past or contemporaneous pipeline developers who treated landowners poorly or did not compensate them fairly. They remain optimistic that, if farmers do their due diligence and justify their demands for compensation, they will be treated fairly.

Similar to the power line case, some pipeline respondents who express energy-related place sentiments also express hope for future employment growth associated with pipeline construction. One respondent recalls:

One day I went up to see one of their guys up on the rigs, and it was Jimmy from Louisiana. We got to talking and he goes, “You know what? As soon as I train somebody to run this rig, I am going back to Louisiana. Nothing against Ohio, but I am an offshore driller guy.” He said. That was the problem we had initially, they had to bring the people in from the outside because they knew how to ... They were trained to do the work. Then we, it took us about two to three years to get caught up and start a well site training center that was developed right here downtown, just down the street, to train workers, to teach welding and to teach everything that needed to be to run these rigs....Our biggest challenge in the next 10, 20 years is going to be workforce, having a workforce that is trained, can pass a drug test and wants to come to work everyday. That is going to be the biggest challenge because the jobs are going to be there....I tell people, “Look, you want Junior to have a job in the next 20 years, we have got to seize the opportunity here.”

This respondent’s exposure to the oil and gas industry both shapes his sense of place and serves as the experience from which he draws in interpreting and evaluating the impact of the pipeline. Using oil and gas extraction as an anchor, he takes a hopeful view of the employment opportunities associated with pipeline construction. And the pipeline’s potential to expand shale-gas extraction is place-enhancing, since oil and gas development
is an important component to his sense of place.

Respondents who express purely farm-based production identities interpret quite differently the potential for employment or economic development associated with the projects. A county commissioner on the power line route states:

This county is one of the larger counties in the state. You can guess that most of [the land] is agricultural, not all of it, but a great chunk of it is agricultural. We feel very strongly that without agriculture this county would have nothing....The farm community is the biggest producer of money in the county.

Many also link this meaning with a sense of vulnerability: “It’s not a great time to be a farmer and rancher right now anyways.” This speaker and others link the image of rural agricultural production to vulnerability associated with price volatility, the thin margins of the farming industry, and a trajectory of hard-fought progress that is distinct from the u-shaped trajectory of arrested decline described by the supporter quoted earlier. One respondent describes farm families’ experience: “It takes generations and generations of building anything to make a living off of.” These respondents describe farm families teetering on the edge of poverty, but they describe a narrative of linear progress rather than decline and feeble recovery.

Respondents in this group focus on disruption to farming and decline in property value that the project could impose, rather than the opportunity to “bring back” lost manufacturing jobs or hedge against risk. They discredit claims about employment opportunities:

What they do is they have like a circus and they get, they hire workers and they all start at a beginning location, you know, in whatever state it is. And then they take their little traveling circus, and they go from the beginning all the way to the end. They’re promising these jobs in the state and this and this but like, we can read license plates. The vast majority of the pipeline workers were from out of state and mostly from Louisiana....It’d be very few local jobs and the people, they would stay at hotels and they would buy gas, but other than that...It’s not people that live in the community for the most part. I mean, there may be some people that get to work on the whole project and travel with it or that they piece in but the vast majority is not going to be.

In addition to dismissing employment opportunities as immaterial, respondents whose production-related place attachments are rooted solely in farming focus their evaluations on disruption
to agriculture and the inadequacy of compensation the developer pays to farmers. A project opponent in Illinois observes:

There are power lines that go, they don’t go parallel with the boundary; they go at an angle across a big, nice field. Oh, that hurts that field....Every time they’re out there doing tillage work, you’ve got to go around it some way. You’ve got to watch for it. You’ve got to watch for it or you’ll hit one of those poles, that big pole. We’re talking about a piece of land that’s worth millions of dollars, and then you have that obstacle.

Respondents whose senses of place are tied solely to agricultural production focus on agricultural impacts when evaluating the project. They dismiss manufacturing employment or service-industry business as either unlikely to transpire or irrelevant to their sense of place. The power line represents a threat of loss rather than an opportunity to recover or hedge against possible losses.

Scale of place attachment also interacts with production-related identities to shape respondents’ views of the projects’ potential as an economic opportunity. One power line supporter describes employment opportunity in the wind-energy industry by contrast with coal-generated electricity and in terms of opportunities for his state:

Wind by its very nature creates jobs in Missouri because Missouri is a manufacturing center that’s all about bending metal. We make airplanes. We make cars. So if you go to the AWEA [American Wind Energy Association] website or any website that shows you the wind energy supply chain, you’re going to see lots of stuff in Missouri. And so wind being built anywhere in the country, is creating jobs in Missouri...Whereas there’s no coal mined in Missouri at all for Missouri electricity production.

Similarly, respondents in the pipeline case describe the pipeline as essential to re-opening capped shale gas wells in Ohio. This evaluation of the project as an opportunity is deeply rooted in the state’s identity as an energy producer. One respondent describes his upbringing:

Where I come from in southeastern Ohio, drilling and oil and gas production is literally part of our collective consciousness, because we’ve been involved with it in agriculture for literally decades and over a century....You see it come in cycles, but now with Marcellus and Utica shale development that you’re seeing over there...It’s not new strata or new discoveries, because we’ve always known the oil and gas is there. It’s basically having the technology to be able to harvest it efficiently and effectively.
This respondent and others view pipeline construction as an essential component to unleashing the state’s energy production potential and as the safest, most efficient technology for doing so. For those to whom oil and gas development is an important source of place meaning, the project is place-enhancing.

Instead of espousing alternative production-related place meanings, some opponents to both projects convey place sentiments strongly rooted in aesthetic qualities. These include portrayals of the community as suburban, depictions of natural landscapes, and affinities for home. One pipeline opponent evokes all three of these, in describing the view from his home:

This is probably one of the more pristine tributaries to the river because it doesn’t have a lot of building around it. It doesn’t go through really any villages or anything. It’s just out in the country. More so it’s being built up more and more because this guy over here wants to develop it. But anyway....I can go on and on. This river is very, very important to me. This whole swamp is. This is a floodplain. In the spring this totally becomes a lake. I call it Lake [his wife’s name].

Later, he describes the developer’s plans for boring beneath his swamp: “They pump the water across where the water is ponded on the upside, put the pipe in, fill it back up, ‘restore’ it.” Scoffing incredulously, he adds, “My battle with anybody was you don’t restore wetlands. You destroy it and then wait for it to come back 50, 75 years later.” These quotes illustrate a contradiction between the pipeline and the aesthetic characteristics that provide meaning to a place and thus build place attachment.

In contrast, many supporters—particularly in the pipeline case—describe landscapes as rural-industrial, a depiction that does not produce the same sense of threat. They note the existence of power lines, electricity generation facilities, highways, pipelines, and other infrastructure and argue that none of these interferes with the productive or aesthetic value of the land. One respondent expresses this in colorful terms:

Do we like pipeline or energy infrastructure? Well I’ll tell you this. Our farm in [a different] County: We have three pipeline systems, an AT&T transmission cable, American Electric Power, a 725 kilowatt transmission line goes across the corner of it. Pennsylvania Railroad and yeah there’s a cellular tower on the farm across the road.
A power line supporter says, “In this locale you can’t see very far anyway. You can’t see very far without seeing cell phone towers, you can’t see very far without seeing other utility poles.” In this view, people are so accustomed to seeing utility infrastructure that they no longer notice it, farmers have gotten used to farming over pipelines and around power poles, and consequently the project does not pose a threat. These respondents do not view a new proposal for industrial infrastructure as a threat to the landscape, since it is already industrialized.4

These different aesthetic characterizations of the community shape respondents’ interpretations of specific project impacts and thereby their evaluations of the project as a threat or opportunity. For instance, opponents whose sense of place is rooted in meanings associated with natural landscapes draw more pessimistic conclusions about the project’s revenue generating potential. They argue that the new infrastructure would cause a decline in property taxes, because landowners would petition (successfully) for a reduction in the assessed value of their homes based on the aesthetic disruption caused by the new infrastructure. In contrast, supporters who view their community as a rural-industrial landscape are not particularly worried about property devaluation, and they cite examples of instances in which power lines, pipelines, or other aesthetic nuisances have failed to cause a reduction in home-sale values. Moreover, an assessor along the power line route points out that the tax revenues from a pipeline that crosses the county generates 35% more revenue than all the farm land in the county. Another supporter points out that nine of the top ten taxpayers in the county are utilities. Other supporters recall situations wherein other counties lowered individual property-tax rates after pipelines produced a windfall for local school districts. Respondents who anchor to these experiences view the power line as an opportunity to add to local revenues and/or reduce local property taxes. These conflicting interpretations are

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4Notably, in the power line case some opponents also depict the landscape as rural-industrial, but they draw a different meaning from the existence of utility infrastructure on many farms. Farmers have done enough and should not have to accept more infrastructure on their properties. In their more generalized depictions of the landscape, opponents portray the community as a rural respite and highlight the negative impact of new infrastructure on view sheds and natural areas. These aesthetic depictions correspond with views of the project as a threat.
informed by the symbolic meanings respondents associate with their communities. For those who view the landscape as already industrialized, one more project does not pose a threat to a landscape already criss-crossed by them. But those who cherish their communities as pastoral respites are more likely to worry about property devaluation caused by visible infrastructure, since this is an interruption to the landscape as they perceive it.

5 Implications and Conclusion

In this paper, we have explored the relationship between sense of place, perceptions of community impacts, and evaluations of community disruptions in the form of energy transmission infrastructure proposals. We build from scholarship that finds little evidence for a NIMBY explanation for community opposition to energy infrastructure, positing instead that public perceptions are more nuanced than the NIMBY label suggests. Survey researchers have used perceptual measures to identify socioeconomic considerations as important drivers of public attitudes, and our analysis helps to elucidate the sources of these perceptions. We deeply explore the place sentiments that help to shape community perceptions of socioeconomic impacts including landowner compensation, jobs, tax revenues, manufacturing activity, electricity provision, and impact to property values and farming operations. We show how the geographic scale of place attachments and the symbolic meanings that compose sense of place inform respondents’ interpretation and evaluation of project impacts.

In the analysis, we advance the sense-of-place framework by applying it in a new context and focusing on both the scale and content of place attachments. Wind-farm development has been the primary context for developing the sense-of-place framework, and we highlight concerns that are prevalent in responding to transmission infrastructure proposals. We also advance the framework itself, by showing how the scale and content of place attachment interact to shape perceptions. Exploring the symbolic meanings underlying place attachments adds nuance to understanding of the relationship between place attachment and attitudes.
toward community disruptions. As our analysis shows, the content of multi-scalar and local place attachments can vary widely with important implications for interpretations and evaluations of disruptions.

The timing of our interviews also distinguishes the analysis, since much prior work focuses on perceptions of projects once they have been installed. We draw our inferences from interviews conducted during the planning and permitting process. Our findings can help scholars and practitioners better understand and address the concerns of community members who will be asked repeatedly to accept infrastructure like the projects we study here.

The interpretation of proposed disruptions is not an atomistic process. Instead, through political and social discourse, interested actors try to shape interpretations in light of pre-existing attachments, and they may even shape those attachments themselves (Moloney and Walker 2007, Devine-Wright and Howes 2010). Our study captures discourses at a single moment in time, such that we cannot trace the social processes that shape our respondents’ place attachments. Instead, future research could trace how social constructions shape individuals’ place attachments and thereby inform their interpretations and evaluations of place disruptions.

The political and social discourses that inform interpretations of disruptions raise important considerations for equity and justice for at least two reasons. First, the power to shape discourse is unequally distributed. Second, places differ in their objective characteristics, which raises perilous implications for communities that already host infrastructure. Variation in communities’ environmental, aesthetic, and economic qualities shapes the available symbols from which individuals draw place-related meanings. This variation thus constrains the possibilities for interpreting impacts through the lens of sense of place (Van der Horst 2007). To the extent that developers site infrastructure by anticipating conflicts between sense of place and proposed projects or adapt compensation accordingly, the nation’s infrastructure future could perpetuate an unjust distribution of costs and benefits accruing from infrastructure siting. Even if community members hold perceptions of their communities as
“industrial” and therefore do not view disruptions as place-threatening, it does not necessarily follow that new infrastructure should be sited there. Nor does it follow that communities whose characteristics imply that residents are likely to view a project as a threat should not accept some share of the nation’s infrastructure capacity expansion.
References


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