

8-31-2016

Perceptions of Risk and Reward of Rapid Energy Exploration in Rural Kansas: Are Older Adults Different?

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Recommended Citation

Wright, Rosemary, Richard Muma, and Teresa Radebaugh. 2016. "Perceptions of Risk and Reward of Rapid Energy Exploration in Rural Kansas: Are Older Adults Different?." *Journal of Rural Social Sciences*, 31(2): Article 7. Available At: <https://egrove.olemiss.edu/jrss/vol31/iss2/7>

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**PERCEPTIONS OF RISK AND REWARD OF RAPID ENERGY
EXPLORATION IN RURAL KANSAS: ARE OLDER ADULTS
DIFFERENT?***

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ABSTRACT

Rural south-central Kansas recently experienced a rapid expansion and decline of oil and gas exploration by large energy companies using high volume hydraulic fracturing and horizontal drilling. This resulted in dramatic changes in the daily lives of residents of this area, many of whom are age 65 and older. To date, there has been little research examining similar effects on older adults. Our qualitative study used focus groups to explore age differences in perceptions of reward and risk associated with exploration activity in one community. We found that although all participants welcomed positive economic effects, older adults compared with other participants had a more nuanced view of benefits associated with the activity of large energy companies, personalized both risks and rewards more, and had a more temporal perception of energy activity. A social ecology model integrated with life span aging theories was useful in understanding differences among groups.

Kansas is often viewed by those outside the state as open prairie devoted to agricultural production. However, Kansas has a long and active history of energy exploration and production, with oil exploration beginning in the late 19th century in some of the same rural areas in the state crossed by the great cattle drive trails. Beginning in 2010, there was a dramatic increase in oil and gas exploration activity in south-central Kansas, primarily because of the ability to use hydraulic fracturing and horizontal drilling as the method of exploration. This activity reached a peak in the state in 2014, with the bulk of exploration occurring in Harper County.

*The authors would like to acknowledge the participation of Dr. Rick J. Scheidt, Kansas State University, in helping to conceptualize this study, and Joan Kahl, University of Kentucky College of Medicine and formerly Kansas State University, for facilitating the focus groups. Corresponding author: Richard D. Muma, Office of Academic Affairs, Wichita State University, 1845 Fairmount, Box 13, Wichita KS 67260-0013, email: richard.muma@wichita.edu, 316.978.5761

Harper County is typical of many rural counties in Kansas: it is sparsely populated, predominantly white, and has a higher than average proportion of residents age 65 and older. In 2014, the population of the county was estimated at 5,818, or about 7.5 persons per square mile compared with the state average of 34.9. The current population is about 75 percent of the population in 1970. This decline is typical of rural counties throughout Kansas because of out-migration of younger adults to more urban areas combined with mortality of the larger, older population. In 2014, about 22 percent of the county population was age 65 and older compared with about 14 percent statewide. About 96 percent of the population is white compared with about 87 percent statewide (United States Census Bureau 2016). Harper County sits squarely above the Mississippian Lime, a large limestone formation that extends from Oklahoma through south-central Kansas, ending in the northwest corner of the state.

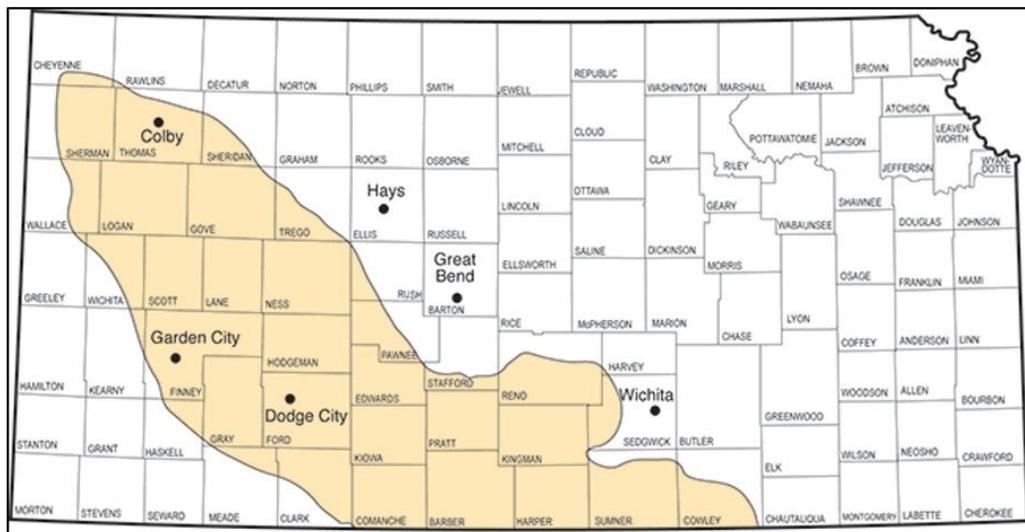


FIGURE 1. BOUNDARY OF THE MISSISSIPPIAN LIMESTONE PLAY IN KANSAS (Kansas Geological Survey 2013)

The permeability and shallowness of the formation allow for exploration for oil and gas using horizontal drilling with less cost than in other types of deposits, including shale or sand, although horizontal drilling is more expensive than traditional vertical drilling (Evans and Newell 2013). This opportunity attracted the attention of large energy companies with significant resources, including Shell Oil and Chesapeake Energy. In 2010, a land rush led by these companies began to acquire oil and gas leases from landowners.

Among many residents, the interest of these large companies spawned economic optimism and expectation of rapid population growth, especially after seeing the increase in economic activity as a result of oil and gas exploration in other rural areas of the United States. However, rewards and risks are often spread unequally during boom periods, and different community contexts affect how these are perceived. Our aim was to examine contextual differences in perceptions of community impact of sudden expansion of energy exploration in rural Kansas. Because of the large proportion of older residents in rural areas of the state, we were especially concerned with whether their perceptions of reward and risk from exploration activity differed from other stakeholders. Our study extends previous energy exploration studies in rural areas by its focus on the perceptions of older adults who are often a higher proportion of the population in rural locations, and because its participants are located in a previously unstudied and often overlooked area of the country's energy boom.

BACKGROUND

Energy Exploration in Kansas

As noted earlier, Kansas has a long history of oil and gas exploration. Harper County has many years of experience in conventional oil and gas exploration with smaller, relatively local independent oil companies. In 2011, oil and gas production began to increase significantly over previous years as a result of the use of hydraulic fracturing and horizontal drilling (often called "unconventional extraction" in the research literature) by large national producers. However, worldwide oil prices reached their highest level in 2013 and then began a dramatic decline. Wells permitted and drilled in Kansas peaked in 2014 and dropped dramatically in 2015. Over 7,000 wells were permitted in 2014 but only 2,304 in 2015. Horizontal well activity peaked in 2013, remained flat in 2014, and dropped dramatically in 2015. In 2013, 259 horizontal wells were permitted and 227 were drilled; by March 1, 2016, only 5 had been permitted and 1 was drilled. By 2015 the exploration boom was over, with large firms quickly exiting the Harper County market. Oil production in the county declined from 2014 to 2015 by 9 percent and gas production remained flat (Kansas Geological Survey 2016).

In Harper County, most land is locally owned. County residents who benefit directly from oil and gas production are those who own land leased to a producer who drills successfully on the leased property. In Kansas, landowners own the subsurface mineral rights unless the rights were severed by a previous landowner. Energy producers lease property subsurface mineral rights from the

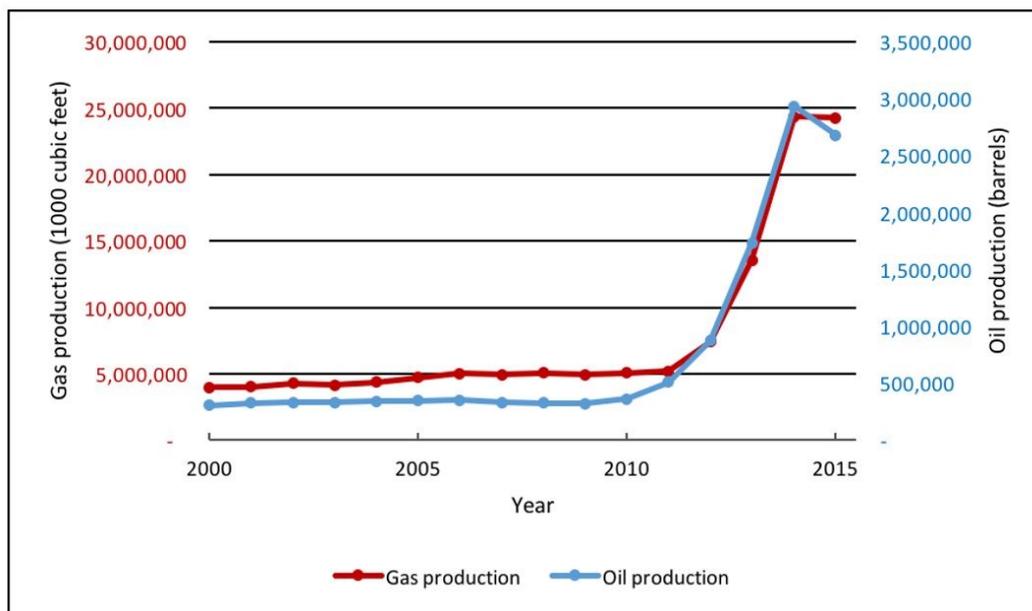


FIGURE 2. ANNUAL OIL AND GAS PRODUCTION, HARPER COUNTY, KANSAS (data from Kansas Geological Survey; 2015 data through September 2015)

owner, and the owner is paid a royalty on production beyond the lease payment. Other conditions such as additional payments, length of lease, and ability to assign the lease may be negotiated by either party (Kansas Geological Survey 2001). Some residents benefit indirectly from increased oil and gas activity in the area. Those who own businesses that serve oilfield workers such as restaurants and gas stations, those with rental properties including hotels, rental houses, and apartments, and those with businesses that help maintain oilfield equipment see increases in revenue through volume or price increases, or both.

Because of increased inflow of cash as well as investments by large energy companies in infrastructure improvement and increased school and social spending, small communities that are economically struggling may experience an increased sense of well-being, if only for a short period. However, extensive research beginning in the 1970s examined boomtown effects in many rural areas of the country, finding that benefits are not equally distributed in boomtown areas, and that benefits to some residents result in negative impacts on others.

The Boomtown Model: Social Disruption

In the 1970s, energy development in the western United States resulted in rapid population and economic change in several small rural towns in the west. An early

study of western boomtowns coined the term “Gillette Syndrome” to describe the negative social changes experienced by residents of Gillette, Wyoming and other locations because of the stresses of life in energy boomtowns: marital difficulties, increases in depression and alcoholism, crime, domestic violence, and more (Kohrs 1974). Other early studies that followed found negative social impacts in boom communities attributed to sudden population increases, including housing shortages, inadequate community services such as health care and schools, an increase in use of mental health services, a decline in neighboring, and for new residents, a sense of being an outsider and an absence of sense of community (Albrecht 1976; Cortese and Jones 1977; Freudenburg, Bacigalupi, and Landoll-Young 1982; Gilmore 1976). From these early studies emerged the “social disruption model” or the “boomtown model” that describes community changes that develop as the result of sudden population growth. This model was outlined by Gilmore (1976) as a problem triangle in which, because of dramatic population increases, there are (1) inadequate community services such as medical care, schools, recreation, and housing; (2) degraded quality of life from inadequate services and recreational opportunities; and (3) declining industrial activity because of worker turnover, absenteeism, and workforce shortages.

Other studies argued that the early boomtown research was extreme in its language and lacking in solid empirical evidence or methodology to assert its claims of social disruption from rapid population growth. Wilkinson et al. (1982) reviewed the existing energy boomtown research and found it scientifically wanting in terms of the data used, the methods used to analyze the data, and as a result, the inferences made about the data. The authors argued for more scientific rigor and systematic application of theory and methods. Krannich and Greider (1984) further suggested that in earlier studies, generalizations of social disruption to all communities experiencing rapid growth were made without adequate attention to context. They argued that social disruption is a multifaceted construct, and as such, it is unlikely that the same types of disruption will be seen across all communities or among all sub-populations within a community, and may also be affected by the timing and duration of community change. Later studies conducted by Krannich, Greider, and others focused on comparative analyses of multiple communities across time and type of community. These studies suggested that social disruption effects differed depending upon when the effects occurred in the boom-bust cycle (Brown, Geertsen, and Krannich 1989; Smith, Krannich, and Hunter 2001), by type of housing and stability of the community (Krannich and Greider 1984), and by

intraindividual characteristics including length of residence within the community and a personal sense of safety (Hunter, Krannich, and Smith 2002).

Post-2000: Stakeholder Perceptions

The advent of new oil and gas exploration methods, especially high-volume hydraulic fracturing (HVHF), resulted in a new stream of research focused on stakeholder perceptions of the impact of exploration on their communities. These studies have been conducted primarily in areas of the United States where there are large shale formations, including the Barnett Shale formation in Texas, the Marcellus Shale formations in New York and Pennsylvania, the New Albany formation in Illinois and Kentucky, and the Haynesville formation in Louisiana.

Many perceived community impacts of HVHF exploration were similar across studies. In most studies, participants believed that energy exploration had improved economic outcomes in their communities (Anderson and Theodori 2009; Crowe et al. 2015; Ladd 2013; Schafft, Borlu, and Glenna 2013), resulting in increases in tax revenues, new jobs, and business for service providers such as restaurants, motels, and oilfield supply companies. In addition, participants mentioned the impact of personal wealth creation for residents who owned property with leasable mineral rights (Brasier et al. 2011; Crowe et al. 2015; Wynveen 2011), although participants were aware that this economic benefit was not available to all community residents.

Most studies mentioned infrastructure challenges, especially road damage from heavy truck traffic (Brasier et al. 2011; Jacquet and Stedman 2013; Schafft et al. 2013; Theodori 2009). Participants in many communities were concerned about issues relating to water, including adequate water supply, the water required by HVHF, and the possibility of pollution of community water supplies (Anderson and Theodori 2009; Crowe et al. 2015; Ladd 2013; Theodori 2009). Perceptions of environmental safety issues were mentioned in several studies, including threats to wildlife and livestock from drilling waste products that could have a direct economic effect on outdoor tourism and farming (Brasier et al. 2011; Crowe et al. 2015; Ladd 2013; Wynveen 2011).

Despite the controversy regarding findings of social impacts in the early boomtown studies, social impacts are still an important aspect of stakeholder perceptions in newer studies. Changes in livability in communities are mentioned in some studies, including an increase in traffic (Jacquet and Stedman 2013; Schafft et al. 2013; Theodori 2009) and concerns about increased crime (Brasier et al. 2011; O'Connor 2015; Wynveen 2011). Concerns about the sense of place also emerge, including the community becoming less like it had always been, or bigger, or more

unattractive because of exploration activity (Crowe et al. 2015; Jacquet and Stedman 2013; O'Connor 2015; Wynveen 2011). It was clear to participants in many studies that there was unequal participation in financial benefits of new energy exploration (Ladd 2013; Wynveen 2011). At least one study found perceptions of the development of a social divide between haves and have-nots because of the sudden increase in wealth for some (Brasier et al. 2011).

Several more recent studies addressed different contexts in which participants experienced rapid energy development. These included temporal contexts including differences over time during an energy boom (Willits, Luloff, and Theodori 2013); social contexts including social position as an insider or an outsider (O'Connor 2015) and local status as a community leader (Anderson and Theodori 2009; Ceresola and Crowe 2015; Crowe et al. 2015; Willits et al. 2013) or as a school administrator (Schafft et al. 2013); and locational contexts including comparisons among participants in different areas of the same formation and comparisons between participants in an area of unconventional energy exploration and the results from older boomtown studies in areas of conventional energy development (Theodori 2009; Wynveen 2011). Age as a perceptual context was considered in one study focused on young adults (O'Connor 2015). However, it does not appear that older adults' perceptions have been specifically explored regarding unconventional energy exploration in prior research.

METHODS

Our aim for this study was to explore differences among community stakeholders in perceptions of sudden energy exploration activity in south-central Kansas. Specifically, we wanted to learn more about older residents' perceptions of risk and rewards compared with the perceptions of other stakeholders. Because we were interested in obtaining a thick description of lived experience, we chose a qualitative approach informed by a grounded theory process. This allowed us the flexibility to capture the contextual differences in perception among stakeholders. The study was approved by the Institutional Review Boards of Wichita State University and Kansas State University.

Data Collection

Focus group methodology was selected to collect data for this study for several reasons. First, our aim was to obtain rich data about participants' perceptions of rapid energy exploration within different contexts. We believed that the use of multiple focus groups would give us an elaborated understanding of these

perceptions. In addition, because this was our research group's first interaction with local residents, we believed a group setting would help participants be more comfortable meeting with us. Not only would participants be within a group of other community members, they would also be referred as a participant by trusted others. Finally, we were concerned about meshing our need for rich data with our need for a cost-effective and time-parsimonious approach. Members of our research group were located in different areas of the state, being able to have data collection take place over a relatively short time while still obtaining quality results was important. We believed that focus groups were the best way to meet both of those needs.

We identified four different community groups that we wanted to sample: older adults, Chamber of Commerce board members, business leaders, and local ministers. Older adults were our research focus, and the other groups comprised stakeholders who we believed would have a community-focused perception of exploration activity and who we could reach readily. Focus groups were moderated by a research group member with extensive focus group experience. A semi-structured interview question route was developed by the research group to inform the moderation of the groups. The focus group meetings were held in convenient locations familiar to participants in July and October 2013 while oil and gas activity was almost at its peak.

With any research methodology, limitations must be considered in advance. With focus groups (as in any research), there is the possibility of bias related to participant self-selection. In addition, even with the best recruitment and follow-up, managing the size of a focus group can be challenging. In spite of verbal commitments to participate from many people, we had fewer participants in at least one group than we expected. Finally, there may be issues related to the group nature of the method that can affect the validity or reliability of the results, such as one or two especially dominant participants or the emergence of groupthink. Because the moderator was highly experienced and professionally trained in the conduct of focus groups, we believe that these issues had minimal impact.

Location

This study was conducted in a small town in Harper County, Kansas, which is located in south-central Kansas just north of the Oklahoma state line. In 2010, the median age was 45.2 compared with a median age of 36 for the entire state. More than one-third of city households included residents age 65 and older. The town's population overwhelmingly identifies as white. The poverty rate is higher than the

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state average, with almost 19 percent of the population living below poverty level compared with 13.7 percent statewide (United States Census Bureau 2016).

Participants

Purposive sampling with referral and convenience sampling were used to recruit focus group participants. Participants were recruited for four different focus groups: older adults, Chamber of Commerce board members, business leaders, and local ministers (Table 1). Older adult participants were recruited during a daily lunch at the local senior center. For the group of business leaders, the mayor of the town and the director of the county extension office each provided lists of possible participants and a pool of 12 was selected from those lists. Chamber of Commerce board members and local ministers were recruited at their regular association meetings. A token incentive was provided for participants.

TABLE 1. FOCUS GROUP PARTICIPANT CHARACTERISTICS (n=32)

GROUP	NUMBER OF		MALES/ FEMALES
	PARTICIPANTS	MEAN AGE	(PERCENT)
Older adults	11	76	64/36
Chamber of Commerce members	11	48	55/45
Ministers	6	62 ^a	100/0
Business leaders	4 ^b	43	50/50

NOTES: All participants were white. This is consistent with the race/ethnicity profile of this county. ^aOnly five participants in this group reported their age.; ^bBecause this group was small and its participants were very similar to those in the Chamber of Commerce group, we collapsed the two groups' results together for analysis.

Data Analysis

Data analysis in this study was informed by a grounded theory approach, although our aim was not to develop a theory but to explore contextual similarities and differences in perception. A grounded theory approach joins positivist elements by providing a systematic method for data collection and analysis with constructivist elements that allow exploration of how participants construct meaning around events and circumstances (Charmaz 2008). This is an inductive approach with a small sample, so it is not expected to provide a basis for prediction or generalization. Instead, it should lead to greater understanding of a phenomenon and point toward areas for more research.

Each focus group was audio recorded, each recording was transcribed verbatim, and each transcription was coded independently by two members of the research team. The initial phase of coding consisted of sentence-by-sentence evaluation in which each sentence was described by phrases that best represented the ideas presented. The second phase of coding involved sorting and organizing the data based upon the most significant initial codes. This is a process of constant comparison, beginning with comparisons within one transcript and continuing with comparisons across transcripts. In essence, data analysis cycles between a within-groups and a between-groups analysis. Overarching conceptual categories were developed to represent key themes within the study based upon the codes. In cases of differences between the coders, codes or categories were added, modified, or eliminated after further discussion.

RESULTS

Analysis of the comments of the three groups revealed much similarity among older adults (OA), community leaders (CL), and ministers (M), with each group's perceptions of risk and reward focused on economic issues, community well-being, and concerns for the future. None of the three groups voiced significant concern about environmental or health effects of exploration methods. However, the group of older adults voiced more nuanced concerns about temporal aspects of rapid energy exploration: what would happen to the town in the future, what their lives would be like in the future, and whether changes were likely to be permanent.

Economic Rewards and Risks

All three groups perceived significant economic gain for residents who owned property, especially those who could lease mineral rights to the energy companies:

We have a lot of farmers who were on the edge and giving up hope, looking at possibly losing the farm...and all of a sudden they [energy companies] injected millions of dollars into this county, just like that...overnight it seemed everything was going to be okay, we were going to survive another day (CL).

Participants noted that because of housing shortages due to the influx of energy workers, homeowners could sell their houses at higher prices and rental property owners could increase rents dramatically, with a negative effect on renters on fixed incomes or in low-wage jobs. The owner of a real estate company commented:

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We are a small real estate company, usually about 30 a year which is pretty good. Last year we closed on 60 properties...people are coming to town and buying the lower end of homes so they can rent them out and also you have people moving to town saying, hey, I have all this lease money and I'm going to retire from farming and buy a house in town...(CL).

However, an increase in rental prices was noted by all three groups, with negative impact on residents whose rent suddenly increased beyond their ability to pay. One minister said "...there is a little house across the street from our church that has rented for as long as I've been here for \$350 a month and it went to \$900 a month. If you are still making your McDonald's wages, there is no way you can pay that." Other participants were concerned about high rents resulting in the loss of good workers at local businesses and service providers: "We are chasing people out of town who have been working here for us, providing the services we need, like at the restaurant and hospital" (OA). This dramatic change in real estate values led to increases in tax valuations of property, resulting in higher taxes for property owners. Higher property taxes were seen as having two sides: they reflect increased wealth in the form of more valuable property, or when the boom ends, they remain high in spite of property declining in value. This concern that property taxes would remain high even as energy exploration and production declined was noted in all three groups: "Sometimes it makes you want to go into the assessor and let him buy my house for what he says it is worth..." (OA).

Higher wages were also seen as having two sides. It was noted by all groups that the oil companies were paying higher wages than local companies could afford to pay, resulting in a loss of employees by some local employers to the oil fields. One community leader said "We are going into harvest with the least amount of staff we have ever had at the station, farm store, elevators, and everything. You can't find people willing to work for what you can afford to pay them, even our high school kids." However, this was also seen as a financial opportunity for young men residents who would otherwise be working in low-wage jobs, and as a stimulus for local employers to raise wages to keep good workers.

An economic multiplier effect was noted by participants in all groups. More workers with more money to spend were perceived as providing economic benefit to local businesses, but there was disagreement about which businesses benefitted. Participants in all groups mentioned restaurants, fast food businesses, and convenience stores as much busier than before the big oil companies arrived, but did

not agree on whether other local businesses received the benefit of additional business because of the transient nature of the oilfield workforce. Besides more retail spending, ministers noted an increase in giving to community causes both by residents who had realized a sudden increase in wealth from lease payments and by energy companies, including gifts that allowed the creation of a day care center and an increase in the level of emergency medical services.

Impacts on Community Well-Being

Both positive and negative effects of the exploration boom on the community were perceived by all three groups, but older adult participants seemed to feel the negative impacts more keenly than either ministers or community leaders, and to be more cautious about seeing the boom's effects on the community in a positive light. Both community leaders and ministers perceived several positive impacts on the community that were not mentioned by older adult participants. Both business leaders and ministers spoke of support by the oil companies for community services including the hospital and emergency medical services, as well as community organizations such as local theater, the Chamber of Commerce, the Ministerial Association, and the annual Balloon Fest. These two groups of participants also noted an increase in good jobs in the community: "...a lot of jobs available for our local kids even; a lot of them have even gone to work in the oilfield and they are making a real salary instead of minimum wage" (CL). Because of the exploration boom, unemployment is not an issue, although finding good workers for lower wage jobs in town has become a problem.

Business leaders felt that the boom had brought a sense of life and liveliness back to a farming community that had struggled with declining population for years: "There have been younger people moving back, a little hustle when you drive down Main Street, there are a few cars again...". However, many older adults saw benefits as time-limited: "As soon as the oil companies leave, these businesses aren't going to be able to continue to pay the higher wages;" "It has brought some good economic stability to the community, but it is a short-time thing;" "We get the benefit from the oil companies right now, but when they leave we are going to be in the same boat we were in before."

Participants in all three groups mentioned perceived issues regarding infrastructure. These issues included adequate roads for heavy truck traffic, adequate electrical supply, and enough water to use for hydraulic fracturing. Participants in all three groups saw both risks and rewards related to infrastructure because of the exploration boom. Participants in all groups spoke of the damage to

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county roads by large trucks owned by the oil companies, as well as the need to maintain and improve the roads. It was perceived by many that the oil companies would pay for these. It was noted by some participants that electrical and water supply issues predated the current boom, and that the boom accelerated addressing these issues with financial assistance from the big oil companies, which was seen as a benefit to the town: "We struggle to get that kind of infrastructure for our little communities, and then they [big oil companies] come in here and plop them up in no time" (CL).

Many participants were concerned about negative impacts on the sense of well-being in the town, but older adults discussed this in more detail. All participants noted an increase in heavy truck traffic in their town, and this was seen as making it more difficult to get around in town than in the past as well as damaging roads. Older adults mentioned irritation at perceived longer waits for service in local restaurants. All groups mentioned concerns about perceived increases in crime. These perceptions ranged from differences between "outsiders" and residents in understanding the unwritten rules of driving in a small town to the sense of an increase in bar fights to fears of increased violent crime as heard in stories about boom towns in North Dakota. Participants in the ministers group focused on perceived negative social impacts on the town, but participants in the older adults group reflected more personal apprehension about social changes and about the possibility of increased crime in their town. One participant tied this possibility to values differences: "It worries me that there will be young men in our town who weren't raised with our values. Our kids have always been able to run off to the swimming pool and we didn't have to worry about them. I just don't know how long that will last if we get our town full of strange men." Another older adult spoke of the perception of residents needing to be more watchful: "You can't leave anything out on the porch or it will walk out...Before, we could leave our doors unlocked." Older adults also seemed more likely to believe stories heard from others about boom towns in other states. One participant mentioned being in a convenience store for coffee and being told by a stranger from North Dakota how negatively big oil exploration had changed his town: "There is so much crime, people are stealing, alcohol, drugs, fights, and all these things going on in their town. There was even a rape in their Walmart parking lot." Among older adult participants, the fear of vulnerability in the face of perceived increasing crime was a concern: "It has created a fear within the city among the elderly group. They seem to be the ones they prey on."

Concerns for the Future

Older adults mentioned concerns about the future of the oil boom and its sustainability within the community much more frequently than participants in other groups, and they often tempered positive statements about the impact of energy exploration with questions about what might happen in the future. As noted earlier, although an increase in wages overall was seen as a benefit of the boom, other older adult participants commented that this increase would not last: “It is good to have now, but what is going to happen five to ten years from now when all of them [the oil companies] leave?” Older adults had a clear belief that new oil exploration would not be the long-term savior of the town, and that it was important to figure out how to grow the town in a sustainable way. “Our economy was eroding before this started and we know this is only a temporary thing...the erosion will continue sooner or later.”

Among all groups, there was the perception that a farming and ranching economic base would not support future growth, nor would it encourage young people to stay in the community or come back after college. It was noted by some that people who came from other areas to work in the oilfields did not bring families with them and did not intend to relocate from other locations. Predictions made at the beginning of the boom of dramatic future population growth of the community—from a current population of about 3,000 to anywhere from 25,000 to 50,000 people over two to five years—now seemed to be recognized as unlikely for the future.

DISCUSSION

Many results of our focus groups paralleled results of earlier studies examining community perceptions of energy exploration and development. Our findings of the perception of increased economic benefits for the community, damage to infrastructure, especially roads, and negative changes in the quality of daily life were similar to those found in studies of exploration in the Barnett shale formation (Anderson and Theodori 2009; Theodori 2009, 2012; Wynveen 2011) and in the Marcellus shale formation (Schafft et al. 2013). Our participants believed that residents who could lease mineral rights attached to their land had the most positive attitudes and outcomes related to energy exploration; this also was found in recent studies in Pennsylvania (Jacquet 2012; Kriesky et al. 2013) and Texas (Theodori 2012). However, few participants in our study mentioned concerns about health or environmental impacts noted in other recent studies (Brasier et al. 2011; Ferrar et al. 2013). In our focus groups, there were no negative comments about the

large energy companies that had entered the community and leased mineral rights. In other studies, mistrust of these companies was mentioned frequently. The apparent absence of health concerns, concerns about environmental impact, or mistrust of large energy companies may be a result of the small number of participants in our study and the more general focus of the discussions. In addition, health and environmental concerns may be of less concern in this locality because the exploration boom was short-lived compared with other areas of the country.

Participants in all three participant groups generally identified the same types of perceived risks and rewards of the local boom in energy exploration. However, there were clear distinctions among the groups about which risks and rewards were most salient. Community leaders had the most positive perceptions of the rewards and saw the risks as generally manageable. Ministers focused more on perceptions of social impacts, both positive and negative. Older adults personalized the risks and rewards, clearly identifying whether they personally would benefit from the boom, and sensing more vulnerability to perceived risks such as increased taxes and higher crime. In addition, participants in the older adults group generally identified a cloud for every silver lining; their perceptions had more negative casts than those of other participants.

From these focus group discussions, we can see that context matters: how an older adult perceives and interacts with his or her environment is different from a younger community leader or minister. The points of intersection of the individual with other people, with the community, and with social structures and customs are different for members of each of the three groups, and these differences can help account for different perceptions of risk and reward. Social ecological models such as those developed by Bronfenbrenner (2009), McLeroy et al. (1988), and others provide a useful cross-disciplinary approach to understanding differences among community groups.

These models provide a transactional explanation for behavior because of dynamic interaction between the individual and the different levels of environment, as well as the impact of change within the different subsystems of the environment over time. These models have been used to address issues related to community change in many different disciplines including sociology, psychology, and public health. In this small Kansas community, we expect that community leaders will have the most opportunity to interact with and have an impact upon more levels of the environment, including policy makers, industry representatives, and social structures in the community including businesses, faith communities, social service organizations, schools, and health care providers. Conversely, older adults may have

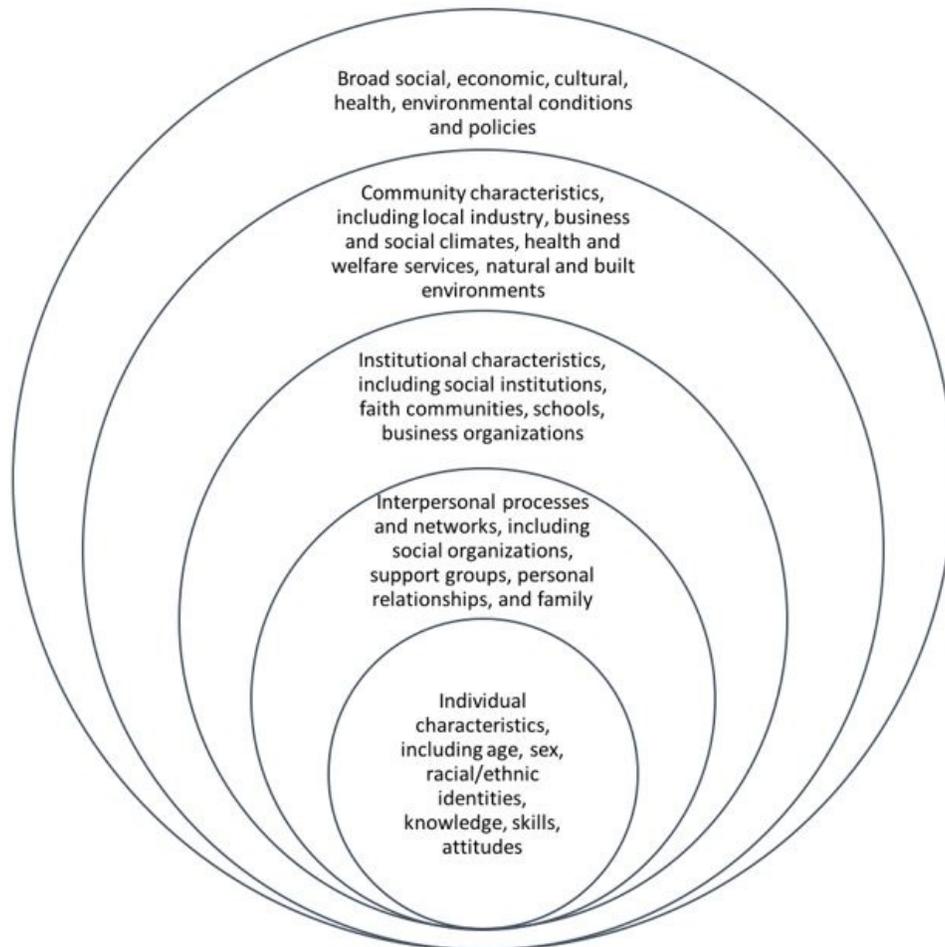


FIGURE 3. A SOCIAL ECOLOGY MODEL (adapted from McLeroy et al. 1988, and the Institute of Medicine 2003)

the least opportunity. Depending upon their age, living situation, and mobility, they may live in physical environments that are more isolated from a broad cross-section of the community, be less involved in community activities, and have less access to situations in which they would receive up to date, accurate information about community issues.

In the focus group transcripts, it appears that there is a difference between how community leaders and ministers received information about issues related to energy exploration and how older adults received information. Community leaders in particular appeared to obtain information from the originating source, such as energy company representatives or city officials. Older adults spoke more about hearing information from people who were further away from the original source

and who may be coloring what they believe is fact with their own beliefs or opinions. For example, one older adult participant said “The lady that is in charge of Friendship Meals in Hutchinson [a nearby town of about 40,000 residents], she said city government has the right to limit how much rents can be raised.” In the older adult group, there was disagreement about who would pay for road repairs, how much prices had risen at the grocery store and the gas stations, and what businesses were making money from new business. There was a great deal of uncertainty about how property taxes would change and how those taxes would be used. It seems likely that older adults are farthest downstream from original communication about issues relating to the exploration boom, so more inferences must be made and unreliable sources of information may be believed. In a sense, community communication relating to the boom resembles a child’s game of “Telephone”: the first person to receive information has received the clearest message, but by the time the message reaches the most vulnerable populations farthest downstream, it has changed so that it has become more alarming and possibly inaccurate.

The temporal focus of older adults compared with younger participants is not surprising. Not only do older adults have a longer period of experience from which to draw inferences about the future, they also have less time in the future to experience benefits of community changes. Life span and life course aging theories such as socioemotional selectivity theory (Carstensen 2006) and the social convoy model (Antonucci, Ajrouch, and Birditt 2014) focus on the impact of time and relationships on the perceptions and behavior of older adults. These theories provide another way to understand the contextual importance of time in our results. For many older adults, social networks shrink through the passage of time, and the quality and structure of social networks may change. Carstensen’s work suggests that as future time becomes less expansive, older adults prefer to spend time with valued others rather than people who are less important in their social networks. Antonucci’s model provides a way of positioning those relationships within the structure of a social ecology that changes with age by identifying which relationships are most important to the individual. These two theories used with a social ecology model suggest that older adults may prefer to obtain their information about energy exploration from trusted others in their social networks rather than people with whom they have no historical relationship. However, those sources may be the least likely to provide accurate information.

CONCLUSION

What was the actual measurable impact of the boom on this community? The population of the town did not increase, and in fact appears to have continued to shrink. The expectation of a large increase in students in the school district was not realized. In the ten years from 2005 to 2015, enrollment in the district fluctuated each year, with net losses of students seven out of the ten years. It reached its nadir in 2015, with a total enrollment of 866, a net loss of 33 students from the previous year (Kansas Department of Education 2016). Tax receipts fluctuated with boom activity. Sales tax receipts increased throughout the period of the boom, more than doubling in 2014 over 2010. However, tax receipts dropped by almost 30% from 2014 to 2015 (Kansas Department of Revenue 2016). Property tax collections rose more modestly during the boom period. They rose a total of about 26% during the period 2010 through 2013, and then declined by 6% in 2014 (Kansas Open Government 2016). Criminal activity also rose throughout the boom period, validating our participants' perceptions. Arrests rose dramatically from 2010 through 2014, with total arrests for crimes in the county more than doubling during the period, rising from a total of 83 in 2010 to a total of 177 in 2014. The bulk of the arrests were for driving under the influence, alcohol and drug violations, and simple battery (Kansas Bureau of Investigation 2016).

In 2010, the average refinery price for a barrel of Kansas crude oil was about \$72. At the time this paper was written in 2016, the average price was \$14.46, reflecting the worldwide decline in the price of oil. This price collapse ended active exploration and drilling in many areas of the state. Unlike many similar small communities, at the end of the oil exploration boom this community received an unexpected economic gift in the form of a new oil transmission pipeline project. Construction of this pipeline is expected to continue through 2016, and temporary housing built for the oil boom is occupied again (Heck 2016). The future of farming, ranching, and energy production as economic drivers depends entirely upon commodity prices set by demand that is beyond the control of this small town in Kansas.

Many avenues for further study emerge from this initial focus group study. There is no question that rural areas once dependent upon agriculture must examine opportunities for development of new sources of economic growth. However, the clear contextual differences among participants in our study point to a need for more stakeholder analysis in communities where economic development is a priority. In small rural communities with high proportions of older adults, it is especially important to learn more about the full impact on them of development

opportunities and to examine methods of enhancing positive impacts and reducing negative impacts. Examining the social ecology of this community in more depth to learn more about different drivers of well-being among stakeholders would be valuable.

One apparent result of the increase in HVHF in this area has been a dramatic increase in earthquake activity. These earthquakes have been attributed to the use of wastewater wells used to dispose of water from the hydraulic fracturing process. Many of these earthquakes are located close to the Kansas-Oklahoma border and have received much media attention (Dillon 2015; Morrison 2016; Schuessler 2015). Seismic activity has produced concerns among the public not only about personal safety, but also about structural integrity of homes and commercial buildings as well as effects on value of those buildings. Both Oklahoma and Kansas are now attempting to regulate disposal of wastewater. Our focus groups took place before strong earthquake activity began, and earthquake activity was not mentioned by any participants. However, this dramatic change may have resulted in different attitudes about energy companies, environmental concerns, and the sense of well-being in this community and should be examined in more detail.

Finally, with the exploration boom over for now, revisiting this community to get a sense of what residents learned from their experience and any permanent changes they have experienced would be valuable. There may be much to be learned about community and individual resilience and adaptability in the face of sudden change.

REFERENCES

- Albrecht, Stan L. 1976. "Socio-Cultural Factors and Energy Resource Development in Rural Areas in the West." Paper presented at the Annual Meetings of the Rural Sociological Society, August 1976. Retrieved August 9, 2016 (<http://files.eric.ed.gov/fulltext/ED129526.pdf>).
- Anderson, Brooklynn J. and Gene L. Theodori. 2009. "Local Leaders' Perceptions of Energy Development in the Barnett Shale." *Southern Rural Sociology* 24(1):113–29.
- Antonucci, Toni C., Kristine J. Ajrouch, and Kira S. Birditt. 2014. "The Convoy Model: Explaining Social Relations from a Multidisciplinary Perspective." *The Gerontologist* 54(1):82–92. doi: 10.1093/geront/gnt118.
- Brasier, Kathryn J., Matthew R. Filteau, Diane K. McLaughlin, Jeffrey Jacquet, Richard C. Stedman, Timothy W. Kelsey, and Stephan J. Goetz. 2011. "Residents' Perceptions of Community and Environmental Impacts from

- Development of Natural Gas in the Marcellus Shale: A Comparison of Pennsylvania and New York Cases." *Journal of Rural Social Sciences* 26(1):32–61.
- Bronfenbrenner, Urie. 2009. "Ecological Models of Human Development." Pp. 14–9 in *Readings on the Development of Children*, edited by M. Gauvain and M Cole. New York: Worth.
- Brown, Ralph B., H. Reed Geertsen, and Richard S. Krannich. 1989. "Community Satisfaction and Social Integration in a Boomtown: A Longitudinal Analysis." *Rural Sociology* 54(4):568–86.
- Carstensen, Laura L. 2006. "The Influence of a Sense of Time on Human Development." *Science* 312(5782):1913–15.
- Ceresola, Ryan G and Jessica Crowe. 2015. "Community Leaders' Perspectives on Shale Development in the New Albany Shale." *Journal of Rural Social Sciences* 30(1):62.
- Charmaz, Kathy. 2008. "Grounded Theory." Pp. 81–110 in *Qualitative Psychology*, edited by J. A. Smith. London: Sage.
- Cortese, Charles F. and Bernie Jones. 1977. "The Sociological Analysis of Boom Towns." *Western Sociological Review* 8(1):76–90.
- Crowe, Jessica, Tony Silva, Ryan G. Ceresola, Amanda Buday and Charles Leonard. 2015. "Differences in Public Perceptions and Leaders' Perceptions on Hydraulic Fracturing and Shale Development." *Sociological Perspectives* 58(3):441–63.
- Dillon, Karen. 2015. "Kansas Quakes Likely Caused by Disposal of Saltwater That Results from Oil and Gas Fracking Process." *Lawrence Journal World*. Retrieved: February 15, 2016 (<http://www2.ljworld.com/news/2015/jan/17/kansas-earthquakes-likely-caused-oil-and-gas-frack/>).
- Evans, Catherine S. and K. David Newell. 2013. "The Mississippian Limestone Play in Kansas: Oil and Gas in a Complex Geologic Setting." *Public Information Circular*:1–6. Retrieved: November 25, 2015 (<http://www.kgs.ku.edu/Publications/PIC/PIC33r.pdf>).
- Ferrar, Kyle J., Jill Kriesky, Charles L. Christen, Lynne P. Marshall, Samantha L. Malone, Ravi K. Sharma, Drew R. Michanowicz, and Bernard D. Goldstein. 2013. "Assessment and Longitudinal Analysis of Health Impacts and Stressors Perceived to Result from Unconventional Shale Gas Development in the Marcellus Shale Region." *International Journal of Occupational and Environmental Health* 19(2):104–12.
- Freudenburg, William R., Linda M. Bacigalupi, and Cheryl Landoll-Young. 1982. "Mental Health Consequences of Rapid Community Growth: A Report from the

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- Longitudinal Study of Boomtown Mental Health Impacts." *Journal of Health and Human Resources Administration* 4(3):334–52.
- Gilmore, John S. 1976. "Boom Towns May Hinder Energy Resource Development." *Science* 191(4227):535–40.
- Heck, Josh. 2016. "Stayin' Alive." Pp. 12–13 in *Wichita Business Journal*, Vol. 31. Wichita, KS: American City Business Journals.
- Hunter, Lori M., Richard S. Krannich, and Michael D. Smith. 2002. "Rural Migration, Rapid Growth, and Fear of Crime." *Rural Sociology* 67(1):71–89.
- Institute of Medicine Committee on Assuring the Health of the Public in the 21st Century. 2003. *The Future of the Public's Health in the 21st Century*. Washington DC: National Academies Press.
- Jacquet, Jeffrey B. 2012. "Landowner Attitudes toward Natural Gas and Wind Farm Development in Northern Pennsylvania." *Energy Policy* 50:677–88.
- Jacquet, Jeffrey B. and Richard C. Stedman. 2013. "Perceived Impacts from Wind Farm and Natural Gas Development in Northern Pennsylvania." *Rural Sociology* 78(4):450–72.
- Kansas Bureau of Investigation. 2016. "Crime Statistics." Retrieved February 15, 2016 (http://www.accesskansas.org/kbi/stats/stats_crime.shtml).
- Kansas Department of Education. 2016. "Kansas K-12 Reports." Retrieved February 15, 2016 (http://uapps.ksde.org/k12/CountyStatics.aspx?org_no=D0361).
- Kansas Department of Revenue. 2016. "Sales Tax Reports". Retrieved February 15, 2016 (<http://www.ksrevenue.org/salesreports.html>).
- Kansas Geological Survey. 2001. "Mineral Rights and Leasing" *Petroleum: A Primer for Kansas*. Retrieved November 25, 2015 (<http://www.kgs.ku.edu/Publications/Oil/primer11.html>).
- _____. 2013. "Boundary of the Mississippian Limestone Play in Kansas". Retrieved November 25, 2015 (<http://www.kgs.ku.edu/Publications/PIC/PIC33r.pdf>).
- _____. 2016. "Oil and Gas Well Statistics for Kansas". Retrieved February 15, 2016 (<http://www.kgs.ku.edu/PRS/wellStats.html>).
- Kansas Open Government. 2016. "Property Tax Collections." Retrieved February 15, 2016 (<http://www.kansasopengov.org/PropertyTax/CountyonlyPropertyTaxes/tabid/2401/Default.aspx>).
- Kohrs, ElDean V. 1974. "Social Consequences of Boom Growth in Wyoming." Paper presented at the Rocky Mountain American Association of the Advancement of Science, April 24–26, 1974, Laramie, WY.

- Krannich, Richard S. and Thomas Greider. 1984. "Personal Well-Being in Rapid Growth and Stable Communities: Multiple Indicators and Contrasting Results." *Rural Sociology* 49(4):541–52.
- Kriesky, Jill, Bernard D. Goldstein, Katrina Zell, and Scott Beach. 2013. "Differing Opinions About Natural Gas Drilling in Two Adjacent Counties with Different Levels of Drilling Activity." *Energy Policy* 58:228–36.
- Ladd, Anthony E. 2013. "Stakeholder Perceptions of Socioenvironmental Impacts from Unconventional Natural Gas Development and Hydraulic Fracturing in the Haynesville Shale." *Journal of Rural Social Sciences* 28(2):56–89.
- McLeroy, Kenneth R., Daniel Bibeau, Allan Steckler, and Karen Glanz. 1988. "An Ecological Perspective on Health Promotion Programs." *Health Education and Behavior* 15(4):351–77.
- Morrison, Oliver. 2016. "Kansas' Largest Oil Producer Rejects Oklahoma Earthquake Regulations." *Wichita Eagle*. Retrieved: February 15, 2016 (<http://www.kansas.com/news/local/article54220685.html>).
- O'Connor, Christopher D. 2015. "Insiders and Outsiders: Social Change, Deviant Others, and Sense of Community in a Boomtown." *International Journal of Comparative and Applied Criminal Justice* 39(3):219–38.
- Schafft, Kai A., Yetkin Borlu, and Leland Glenna. 2013. "The Relationship between Marcellus Shale Gas Development in Pennsylvania and Local Perceptions of Risk and Opportunity." *Rural Sociology* 78(2):143–66.
- Schuessler, Ryan. 2015. "Southern Kansas Sees Sudden Spike in Earthquakes." *Washington Post*. Retrieved: February 15, 2016 (<https://www.washingtonpost.com/news/energy-environment/wp/2015/10/27/southern-kansas-sees-sudden-spike-in-earthquakes/>).
- Smith, Michael D., Richard S. Krannich, and Lori M. Hunter. 2001. "Growth, Decline, Stability, and Disruption: A Longitudinal Analysis of Social Well Being in Four Western Rural Communities." *Rural Sociology* 66(3):425–50.
- Theodori, Gene L. 2009. "Paradoxical Perceptions of Problems Associated with Unconventional Natural Gas Development." *Southern Rural Sociology* 24(3):97–117.
- _____. 2012. "Public Perception of the Natural Gas Industry: Data from the Barnett Shale." *Energy Sources, Part B: Economics, Planning, and Policy* 7(3):275–81.
- United States Census Bureau. 2016. "Quick Facts: Harper County, Kansas". Retrieved February 1, 2016 (<http://www.census.gov/quickfacts/table/PST045215/20077>).

PERCEPTIONS OF RAPID ENERGY EXPLORATION

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- Wilkinson, Kenneth P., James G. Thompson, Robert R. Reynolds, and Lawrence M. Ostresh. 1982. "Local Social Disruption and Western Energy Development a Critical Review." *Sociological Perspectives* 25(3):275–96.
- Willits, Fern K, Albert E Luloff, and Gene L Theodori. 2013. "Changes in Residents' Views of Natural Gas Drilling in the Pennsylvania Marcellus Shale, 2009-2012." *Journal of Rural Social Sciences* 28(3):60–75.
- Wynveen, Brooklynn J. 2011. "A Thematic Analysis of Local Respondents' Perceptions of Barnett Shale Energy Development." *Journal of Rural Social Sciences* 26(1):8–31.