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## Perceptions of Local Leaders in Shale Energy Communities: Views on Influence, Inclusion, and Trust (A Research Note)

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## Perceptions of Local Leaders in Shale Energy Communities: Views on Influence, Inclusion, and Trust (A Research Note)

### Cover Page Footnote

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# Perceptions of Local Leaders in Shale Energy Communities: Views on Influence, Inclusion, and Trust

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## ABSTRACT

Data collected from random samples of residents and absentee landowners in two counties in the Eagle Ford Shale region of South Texas were used to examine the perceptions regarding influence, inclusion, and trust of local leaders and other stakeholders in the area. Additionally, two hypotheses pertaining to the association between individuals' perceptions of inclusion by local governments—both city and county—and individuals' levels of trust in those governments as sources of information about the positive and negative impacts of shale oil and/or natural gas development were tested and supported. Substantive descriptive and statistical analyses are reported.

## KEYWORDS

Decision-making; Eagle Ford Shale; hydraulic fracturing; shale energy development; survey research; trust

## INTRODUCTION

Despite the vast social-scientific literature on community leaders' and/or residents' attitudes toward shale energy development and hydraulic fracturing (Jacquet et al. 2019; Theodori et al. 2019), surprisingly little empirical research has been conducted on local residents' views of their city and county leaders—those elected officials who are charged with managing both the benefits and burdens of shale energy development (Kreuze, Schelly, and Norman 2016; Willits, Luloff, and Theodori 2013a). The purpose of this research note is to address this paucity of research. Here, we use data collected from random samples of residents and absentee landowners in two counties in the Eagle Ford Shale region of

south Texas to empirically examine: (a) individuals' perceived influence in the management decisions pertaining to shale oil and gas development occurring in/near local communities, as well as the perceived influence of the local officials and other stakeholders; (b) the amount of effort individuals believed that city and county officials, as well as representatives of other local, regional, state, and federal groups/agencies, make to include local residents' concerns into decisions regarding oil and gas industry development; and (c) the amount of trust individuals had in the city and county governments and other groups/organizations as sources of information about the positive and negative impacts of oil and/or natural gas development. After presenting descriptive statistics for the aforementioned issues, we test the following two hypotheses:

- H<sub>1</sub>: Perceived efforts by city government to include local residents' input into decisions regarding shale oil and gas development is positively associated with trust in the local city government as a source of information about the positive and negative impacts of shale oil and/or natural gas development.
- H<sub>2</sub>: Perceived efforts by county government to include local residents' input into decisions regarding shale oil and gas development is positively associated with trust in the local county government as a source of information about the positive and negative impacts of shale oil and/or natural gas development.

## SETTING THE STAGE

Willits, Luloff, and Theodori (2013a) used survey data gathered between June and October 2012 from a random sample of individuals living in 21 counties in the Pennsylvania Marcellus Shale region to examine the amount of trust they had in five groups/organizations related to natural gas development. The five groups/organizations listed on the survey included: (a) natural gas industry; (b) state officials and organizations; (c) local officials and organizations; (d) environmental groups/organizations; and (e) scientists/researchers. Response categories provided were "no trust," "very little trust," "some trust," "great deal of trust," and "don't know." Overall, the data showed that sampled residents had the least amount of trust in state officials/organizations (38 percent reported some or a great deal of trust), followed by local officials/organizations (50 percent reported some or a great deal of trust). Concomitantly, eight in ten respondents (80 percent) reported they had some or a great deal of trust in

scientists/researchers, whereas approximately six in ten (61 percent) respondents reported trust in environmental groups/organizations. Fifty-seven percent reported they had at least some trust in the natural gas industry.

Kreuze et al. (2016) analyzed the content of 63 popular media sources and used data from 31 semi-structured interviews to explore perceptions of the risks and opportunities associated with high-volume hydraulic fracturing (HVHF)<sup>1</sup> in two counties in Michigan—Barry County and Crawford County. A notable theme uncovered in their content analysis and interview data pertained to “the lack of power local governments have to make decisions or regulate HVHF in their communities” (p. 49). Kreuze et al.’s content analysis revealed that “limited local power was a key issue” (p. 49). Moreover, their qualitative data established that the interviewees shared frustrations with “[T]he extremely limited control local governments have regarding HVHF decisions and regulation in their communities...” (p. 49).

These two studies have shed light on residents’ and/or stakeholders’ perceptions of local leaders in shale energy communities. Undoubtedly, additional research is warranted. This research note extends the scientific work on the topic. An increased understanding of local residents’ views of their local leaders/elected officials in areas experiencing shale energy development should prove beneficial for city and county administrators, decision-makers, and citizens, as well as researchers, Cooperative Extension personnel, and practitioners working in the field of community development.

## DATA

The data used for this note were collected in a mail survey from random samples of residents and absentee landowners in two counties within the Eagle Ford Shale region of Texas—Karnes County and La Salle County.<sup>2</sup> The Eagle Ford Shale is a hydrocarbon-bearing formation located in south Texas.<sup>3</sup> Since the first exploration wells were drilled into the Eagle Ford in 2008, the formation has produced considerable volumes of oil, gas, and condensate (RRC 2018), resulting in billions of dollars in economic output to the region (TAMEST 2017; Tunstall et al. 2014). The majority of energy production in the Eagle Ford Shale has occurred in Karnes County, La Salle County, and 13 additional core counties (Tunstall et al. 2014).<sup>4</sup>

Following a modified tailored design method (Dillman, Smyth, and Christian 2014), we first mailed an informational letter to 525 addresses of residents and/or absentee landowners in La Salle County and 525

addresses of residents and/or absentee landowners in Karnes County in February 2015.<sup>5</sup> This letter informed sampled individuals that their household was randomly selected for participation in an upcoming study about public perceptions of oil and natural gas development in the Eagle Ford Shale region of Texas. Individuals from three sampled residential households in La Salle County and six sampled households associated with Karnes County (five residential households and one absentee landowner household) contacted the researchers and requested not to participate in the study. Addresses for these nine sampled households were not replaced. Hence, the final sample size was reduced to 1,041.

In March 2015, a survey questionnaire was mailed to the sampled households. To obtain a representative sample of individuals within residences, a response from the adult who most recently had his/her birthday was requested in the cover letter. The survey questionnaire, organized as a self-completion booklet, contained 39 questions and required approximately 50 minutes to complete. After the initial survey mailing and two follow-up mailings during April and May of 2015, a total of 115 questionnaires were returned (44 from La Salle County; 71 from Karnes County)—a response rate of 11.0 percent.<sup>6</sup>

Follow-up surveys with nonrespondents did not occur. Therefore, to examine the likelihood of nonresponse error, selected sociodemographic characteristics of the survey respondents in each county were compared with those of the populations in the places using data from the United States Census Bureau's 2014 and 2015 American Community Survey (ACS) (see Table 1). Comparisons of the distributions of sociodemographic variables such as gender, age, race, levels of education, and household income between survey data and census data is a common method for assessing the *potential* of nonresponse bias (Groves 2006; Smith 1983). In this study, survey respondents associated with each county were compared to their respective county's population on the following five dimensions: percentage male, percentage age 65 or older, percentage white, percentage high school graduate or higher, and percentage household income \$50,000 or more. Overall, the percentages of survey respondents who graduated high school and were male, age 65 or older, and lived in a household with an annual income of \$50,000 or more were greater than the general populations of the counties. In Karnes County, the percentage of white survey respondents was slightly greater than the general population; however, in La Salle County, the percentage of white survey respondents was substantially less than the general population. Due to these discrepancies between the sample and census

data—many of which are commonly reported in the research literature (Bladon 2010; Goyder, Warriner, and Miller 2002; Green 1996)—caution should be taken when interpreting the results of the statistical analyses presented below.

Table 1: Selected Sociodemographic Characteristics of the Survey Respondents Associated with Each County and the Respective County's Population

	Karnes County		La Salle County	
	American Community Survey data	2015 Eagle Ford Shale survey data <sup>c</sup>	American Community Survey data	2015 Eagle Ford Shale survey data <sup>d</sup>
% male	59.1 <sup>a</sup>	65.7	55.9 <sup>a</sup>	60.5
% 65 or older	14.5 <sup>a</sup>	54.7	13.6 <sup>a</sup>	29.3
% white	63.6 <sup>a</sup>	87.5	80.0 <sup>a</sup>	39.0
% high school graduate or higher	73.7 <sup>a</sup>	95.2	61.4 <sup>a</sup>	90.2
% household income \$50,000 or more	45.3 <sup>b</sup>	84.7	26.4 <sup>b</sup>	58.5

<sup>a</sup> Percent reported for 2011-2015 American Community Survey 5-year estimates.

<sup>b</sup> Percent reported for 2010-2014 American Community Survey 5-year estimates.

<sup>c</sup> Karnes County percentages were calculated based upon the following number of valid survey data cases: % male, n = 67; % 65 or older, n = 64; % white, n = 64; % high school graduate or higher, n = 63; and % household income \$50,000 or more, n = 59.

<sup>d</sup> La Salle County percentages were calculated based upon the following number of valid survey data cases: % male, n = 43; % 65 or older, n = 41; % white, n = 41; % high school graduate or higher, n = 41; and % household income \$50,000 or more, n = 41.

## MEASUREMENT

### *Perceived Influence in Local Shale Oil and Gas Decision-making*

Two items were used to create quotients that accounted for perceived differences in desired and actual influences of selected groups and organizations on the management decisions pertaining to shale oil and gas development occurring in/near respondents' communities.<sup>7</sup>

Respondents were asked to rate the amount of influence they perceived the entities *should have* and *actually have* on such management decisions. Groups/organizations analyzed in this note included: (a) residents of locally-affected communities; (b) officials of locally-affected communities; (c) state groups/organizations (a combined measure of state natural resource agencies and the Texas State Legislature); and (d)

federal groups/organizations (a combined measure of federal natural resource agencies and the U.S. Congress). Response categories included “no influence,” “a little influence,” “moderate influence,” and “major influence.” For purposes of analysis, response categories were coded 1 through 4, with 1 = no influence and 4 = major influence.

The quotients were created by dividing the responses to items measuring the amount of influence respondents perceived each entity should have by the responses to items measuring the amount of influence respondents perceived each entity actually has. A value of 1 indicated that perceived influence regarding what these groups/organizations should have and actually have were equated. A value above 1 implied that respondents perceived the group or organization should have more influence than it actually does, and a value below 1 inferred a scenario in which respondents perceived the group or organization actually having more influence than it should on local management decisions pertaining to shale oil and gas development.

*Efforts by Selected Federal and State Agencies and Regional and Local Groups/Organizations to Include Local Residents' Input into Decisions Regarding Shale Oil and Gas Industry Development*

Using a 7-point response scale ranging from “far too little effort” through “about right level of effort” to “far too much effort,” respondents were asked to circle the number that best indicated how much effort they believed selected federal/state agencies and regional/local groups/organizations make to include local residents' concerns into decisions regarding oil and gas industry development. Selected federal and state agencies included: (a) Environmental Protection Agency; (b) Texas Railroad Commission; (c) Texas A&M AgriLife Extension; (d) Texas Commission on Environmental Quality; and (e) Texas State Legislature. Selected regional and local groups/organizations included: (a) oil and gas industry; (b) environmental groups/organizations; (c) scientists/researchers; (d) South Texas Energy and Economic Roundtable (STEER); (e) America's Natural Gas Alliance (ANGA); (f) county government; (g) city government; and (h) Eagle Ford Consortium. For purposes of analysis, response categories were coded as -3 (far too little effort) to 3 (far too much effort). A value of 0 indicated that the respondent believed the group/organization was making about the right level of effort to include local residents' input into oil and gas development decision-making.



*Trust in Selected Groups/Organizations as Sources of Information about the Positive and Negative Impacts of Shale Oil and/or Natural Gas Development*

Respondents were asked to indicate how much trust they had in each of 13 groups/organizations as sources of information about the positive and negative impacts of oil and/or natural gas development. The 13 groups/organizations listed on the survey included: (a) oil/natural gas industry; (b) Texas Railroad Commission; (c) U.S. Environmental Protection Agency; (d) Texas Commission on Environmental Quality; (e) Texas A&M AgriLife Extension; (f) environmental groups/organizations; (g) scientists/researchers; (h) South Texas Energy and Economic Roundtable (STEER); (i) America's Natural Gas Alliance (ANGA); (j) [respondent's] county government; (k) [respondent's] local city government; (l) Texas State Legislature; and (m) Eagle Ford Consortium. Response categories included "no trust," "very little trust," "some trust," a "great deal of trust" and "don't know." For purposes of analysis, response categories were dichotomized and coded as 0 = "no trust/very little trust" and 1 = "some trust/a great deal of trust." Paralleling previous research that analyzed survey questions dealing with trust in institutions to communicate and manage risks associated with Marcellus Shale gas development (Brasier et al. 2013; Willits, Luloff, and Theodori 2013b; Willits, Theodori, and Luloff 2016), respondents who selected "don't know" were excluded from analysis.<sup>8</sup>

## FINDINGS

### *Descriptive Analyses*

*Perceived influence in local shale oil and gas decision-making.* As shown in Table 2, descriptive results revealed that survey respondents perceived local residents (i.e. themselves) as having the largest discrepancy between desired and actual influence in decision-making processes pertaining to shale oil and gas development (quotient = 1.95). Respondents also believed an imbalance of influence existed among local officials. The perceived influence quotient of 1.44 indicates that respondents perceived officials of locally-affected communities should have more influence in local oil and gas decision-making than they actually do. For state and federal groups and organizations, the perceived influence imbalance was manifest in the opposite direction. Respondents believed that both state and federal groups/organizations actually have more influence on local oil and gas decision-making than they should have (perceived quotients of 0.98 and 0.88, respectively).

Table 2: Perceived Influence of Groups/Organizations in Local Oil and Gas Decision-Making

Groups/Organizations	Perceived Influence Quotient <sup>a</sup>
Residents of locally affected communities <i>n</i> = 99	1.95 (1.07)
Officials of locally affected communities <i>n</i> = 100	1.44 (0.73)
State groups/organizations <i>n</i> = 98	0.98 (0.35)
Federal groups/organizations <i>n</i> = 99	0.88 (0.40)

<sup>a</sup> Standard deviations included in parentheses.

*Efforts by selected federal and state agencies and regional and local groups/organizations to include local residents' input into decisions regarding shale oil and gas industry development.* Respondents' beliefs about the amount of effort federal/state agencies and regional/local groups and organizations made to include local residents' concerns into decisions regarding oil and gas industry development are presented in Table 3. Of the 13 selected agencies and groups/organizations, respondents believed that, overall, their city and county governments made the least effort to include local residents' concerns into decisions regarding oil and gas industry development ( $M = -1.21$  and  $M = -1.13$ , respectively). Respondents believed environmental groups/organizations ( $M = -0.61$ ), scientists/researchers ( $M = -0.60$ ), and Texas A&M AgriLife Extension ( $M = -0.53$ ) made the most concerted efforts to include local residents' concerns into decisions regarding oil and gas industry development.

Table 3. Perceived Efforts of Federal and State Agencies and Regional and Local Groups/Organizations to Include Local Residents' Input into Decisions Regarding Oil and Gas Industry Development

Agencies and Groups/Organizations	Mean values <sup>a</sup>
[Respondent's] city government <i>n</i> = 98	-1.21 (1.69)
[Respondent's] county government <i>n</i> = 99	-1.13 (1.59)
Texas State Legislature <i>n</i> = 99	-0.97 (1.49)
Texas Railroad Commission <i>n</i> = 100	-0.93 (1.60)
Environmental Protection Agency <i>n</i> = 101	-0.92 (1.74)
South Texas Energy & Economic Roundtable (STEER) <i>n</i> = 97	-0.82 (1.31)
Eagle Ford Consortium <i>n</i> = 98	-0.81 (1.53)
America's Natural Gas Alliance (ANGA) <i>n</i> = 95	-0.76 (1.37)
Texas Commission on Environmental Quality <i>n</i> = 97	-0.74 (1.50)
Oil and gas industry <i>n</i> = 100	-0.74 (1.38)
Environmental groups/organizations <i>n</i> = 99	-0.61 (1.70)
Scientists/researchers <i>n</i> = 98	-0.60 (1.34)
Texas A&M AgriLife Extension <i>n</i> = 98	-0.53 (1.25)

<sup>a</sup> Standard deviations included in parentheses.

*Trust in selected groups/organizations as sources of information about the positive and negative impacts of shale oil and/or natural gas development.* Overall, as shown in Table 4, more than eight in ten respondents reported they had some or a great deal of trust in Texas A&M AgriLife Extension (85 percent) and scientists/researchers (81 percent) as sources of information about the positive and negative impacts of oil and/or natural gas development. Three in four respondents (75 percent) had some or a great deal of trust in the oil/natural gas industry. One half (50 percent) of

respondents had some or a great deal of trust in their county government, whereas only 43 percent of respondents had the same amount of trust in their local city government.

Table 4. Trust in Groups/Organizations as Sources of Information about the Positive and Negative Impacts of Oil and/or Natural Gas Development

Groups/Organizations	Overall percent “some trust or great deal of trust”
Texas A&M AgriLife Extension <i>n</i> = 97	85
Scientists/researchers <i>n</i> = 95	81
Oil/natural gas industry <i>n</i> = 106	75
Texas Commission on Environmental Quality <i>n</i> = 99	68
South Texas Energy & Economic Roundtable (STEER) <i>n</i> = 75	67
Texas Railroad Commission <i>n</i> = 102	65
America’s Natural Gas Alliance (ANGA) <i>n</i> = 85	64
Environmental groups/organizations <i>n</i> = 94	61
Texas State Legislature <i>n</i> = 100	59
Eagle Ford Consortium <i>n</i> = 91	54
U.S. Environmental Protection Agency <i>n</i> = 101	53
[Respondent’s] county government <i>n</i> = 99	50
[Respondent’s] local city government <i>n</i> = 101	43

### *Statistical Analyses*

Building upon previous studies of trust in resource management agencies (Petrzelka and Marquart-Pyatt 2015; Yung, Patterson, and Freimund 2010), we propose that perceived efforts by government officials to include local residents in decision-making processes is a key contributing factor to trust (or distrust). To test our two hypotheses, separate multivariate logistic regression analyses were conducted to determine the effects of perceived efforts by city and county governments to include local residents’ input into decisions regarding oil and gas development upon the dichotomous dependent variables of residents’ trust in those respective local governments as sources of information about the positive and negative impacts of oil and/or natural gas development (see Tables 5 and 6). Response categories for the dependent variables—trust in [respondent’s] county government and trust in [respondent’s] local city

government—were dummy coded (0 = no trust/very little trust; 1 = some trust/a great deal of trust). Mineral rights ownership—a variable commonly incorporated in statistical analyses within the shale energy development literature—and five sociodemographic variables (age, gender, education, race, and income) were included in the analyses as control factors. Mineral rights ownership (0 = does not own mineral rights; 1 = owns mineral rights), gender (0 = female; 1 = male), and race (0 = other; 1 = white) were dummy coded. Age was measured in years. Education was scored as follows: 1 = did not complete high school, 2 = high school or equivalent, 3 = some college or post high school training, 4 = associate's or 2-year vocational degree, 5 = bachelor's degree, and 6 = graduate/professional degree. Income was measured by 14 categories, ranging from 1 = under \$9,999 to 14 = \$130,000 or more.

Table 5. Logistic Regression Analysis of Trust in City Government on Perceived Efforts of City Government to Include Local Residents' Input into Decisions Regarding Oil and Gas Industry Development and Control Variables (n = 69)

Variables	B	SE	Exp(B)	p-value	95% confidence interval for Exp(B)	
					Lower	Upper
Perceived efforts of <u>city</u> government to include local residents' input in decision-making	1.27	0.31	3.57	<.001 <sup>a</sup>	1.95	6.54
<i>Control variables</i>						
Age	0.01	0.04	1.01	.711	0.95	1.09
Gender (1 = male)	-0.89	0.93	0.41	.338	0.07	2.54
Education	-0.25	0.30	0.78	.396	0.43	1.39
Income	0.01	0.10	1.01	.901	0.83	1.23
Race (1 = white)	1.38	1.16	3.98	.233	0.41	38.54
Mineral rights ownership (1 = yes)	-1.88	1.16	0.15	.104	0.02	1.48
Constant	1.93	2.54				
-2 log-likelihood	52.98					
Chi square	40.92			<.001 <sup>a</sup>		
Nagelkerke R <sup>2</sup>	0.60					

<sup>a</sup> significant at the 0.001 level.

Table 6. Logistic Regression Analysis of Trust in County Government on Perceived Efforts of County Government to Include Local Residents' Input into Decisions Regarding Oil and Gas Industry Development and Control Variables (n = 71)

Variables	B	SE	Exp(B)	p-value	95% confidence interval for Exp(B)	
					Lower	Upper
Perceived efforts of <u>county</u> government to include local residents' input in decision-making	1.22	0.28	3.37	<.001 <sup>a</sup>	1.93	5.88
<i>Control variables</i>						
Age	-0.01	0.03	0.99	.663	0.93	1.05
Gender (1 = male)	-0.88	0.79	0.42	.268	0.09	1.97
Education	-0.11	0.25	0.90	.656	0.55	1.45
Income	0.02	0.09	1.02	.840	0.86	1.21
Race (1 = white)	0.98	1.01	2.66	.334	0.37	19.45
Mineral rights ownership (1 = yes)	-0.95	1.03	0.39	.358	0.05	2.93
Constant	3.10	2.50				
-2 log-likelihood	63.85					
Chi square	34.45			<.001 <sup>a</sup>		
Nagelkerke R <sup>2</sup>	0.51					

<sup>a</sup> significant at 0.001 level.

As shown in Tables 5 and 6, substantial support was found for both hypotheses. Perceived efforts of city and county governments to include local residents' input into the decision-making processes surrounding shale oil and gas development were significantly associated with the odds of trusting both forms of government as sources of information about the positive and negative impacts of shale oil and/or natural gas development. The likelihood of respondents to express some or a great deal of trust in their city and county governments as information sources pertaining to shale oil and/or natural gas development increased with the perceived efforts made by such governments to include local residents into shale energy development decision-making processes. In essence, those respondents who perceived that their city and county governments have not made enough efforts at inclusion were more likely than those respondents who viewed their local governments as having made enough

efforts at inclusion to express very little or no trust in these institutions. All of the control variables failed to reach statistical significance.

## SUMMARY

The preceding descriptive and statistical analyses provide insights into residents' views of local leaders in areas experiencing shale energy development. Overall, the results reveal that survey respondents believe that both *local* residents and *local* officials should have more influence than they actually do have on the management decisions pertaining to the shale energy development occurring in/near their communities. These results parallel findings reported by Kreuze et al. (2016). According to the researchers, the qualitative data gathered from their interviewees “highlight the importance of local control and participation in decision-making for communities currently or potentially experiencing the localized impacts of HVHF” (Kreuze et al. 2016:51-52).

The results also suggest that respondents believe that *all* of the agencies and groups/organizations examined in this study are doing *too little* when it comes to including local residents in shale energy development decision-making processes (all of the mean values in Table 3 were negative). Of the federal/state agencies and regional/local groups and organizations examined here, though, respondents ranked their city and county governments first and second, respectively, as the entities making the least efforts to be inclusive. Likewise, with respect to the amount of trust respondents had in selected groups/organizations as sources of information about the positive and negative impacts of shale oil and/or gas development, respondents ranked their city and county governments last and second to last, respectively. Respondents reported having higher levels of trust in individuals (i.e. scientists/researchers), state and federal agencies, and the oil and gas industry than they did in their local governments. Turning attention to the results of the logistic regression analyses, we see that perception of inclusion by local governments—both city and county—is positively associated with residents' levels of trust in local governments as sources of information about the positive and negative impacts of shale oil and/or natural gas development. In short, the findings suggest that local governments are perceived as not doing enough to engage community residents in shale development decision-making processes. This lack of perceived effort to include local residents' input into decisions regarding shale oil and gas development, in turn, is associated with decreased trust in local governing bodies and officials. Interestingly as well, these findings were consistent

across both counties regardless of their somewhat different demographic distinctions.

Lastly, despite the statistical significance of our findings, the limitation of the low response rate must be considered. As participation in survey research continues to decline, low response rates are becoming increasingly commonplace (Baruch and Holtom 2008; Connelly, Brown, and Decker 2003; Curtin, Presser, and Singer 2005; Groves 2011). Nonetheless, it is important to recognize that surveys with low response rates do not necessarily imply inferior results. As espoused by several researchers (Curtin et al. 2005; Groves 2006; Groves and Peytcheva 2008; Keeter et al. 2000; Langer 2003; Meterko et al. 2015; Peytchev 2013), results from surveys with lower response rates may differ little or not at all from those with higher rates of participation. Caution should be taken when generalizing the findings of this study.

## ENDNOTES

<sup>1</sup> Hydraulic fracturing is an industrial process used to stimulate/complete shale gas wells. It has been and remains a highly controversial topic in discussions regarding shale energy development. The process involves flushing large volumes of frac fluid—a mixture of water and proppant, along with friction reducers, disinfectants, and other chemicals—into wells at extremely high pressure levels to create small fissures, or “fractures,” in the shale formations. Hydraulic fracturing is referred to as *fracking* in the vernacular.

<sup>2</sup> Collection of these survey data occurred after analysis of the focus group data gathered in 2013 and 2014 from local residents in Karnes and La Salle counties and the interview data gathered during that same time period from community leaders and industry official in Karnes, La Salle, McMullen, and Gonzales counties. See Ellis et al. (2016) for a nuanced understanding of how local residents perceive shale energy development in the Eagle Ford Shale region and how such development impacts the lives of local residents.

<sup>3</sup> A map of the Eagle Ford shale created by the Railroad Commission of Texas illustrating the number and spatial distribution of completed and permitted oil and gas wells can be found at <https://www.rrc.state.tx.us/oil-gas/major-oil-and-gas-formations/eagle-ford-shale-information>.

<sup>4</sup> These additional core counties include: Atascosa, Bee, DeWitt, Dimmit, Frio, Gonzales, Lavaca, Live Oak, Maverick, McMullen, Webb, Wilson, and Zavala.

<sup>5</sup> Sampled households in each county consisted of 350 residential addresses and 175 absentee landowner addresses. Sampling frames of residential address-based records were purchased from Survey Sampling International (SSI) in January 2015. Sampling frames of absentee landowners were supplied by the La Salle County Appraisal District and the Karnes County Appraisal District offices in February 2015.



<sup>6</sup> For detailed information on the characteristics of the sampled respondents from Karnes County and La Salle County, see Theodori and Uzunian (2015a, 2015b).

<sup>7</sup> Petrzelka and Marquart-Pyatt (2015) used similar survey items to create ratio measures of perceived power. Due to the ordinal nature of the items, we chose to call our measures quotients instead of ratios.

<sup>8</sup> The number of respondents who selected the “don’t know” response category for each of the 13 groups/organizations included: oil/natural gas industry = 9; Texas Railroad Commission = 13; U.S. Environmental Protection Agency = 16; Texas Commission on Environmental Quality = 9; Texas A&M AgriLife Extension = 5; environmental groups/organizations = 12; scientists/researchers = 5; South Texas Energy and Economic Roundtable (STEER) = 7; America’s Natural Gas Alliance (ANGA) = 9; [respondent’s] county government = 19; [respondent’s] local city government = 25; Texas State Legislature = 19; and Eagle Ford Consortium = 17. No systematic differences were uncovered between those respondents who selected a “don’t know” response category and those who gave an opinion.

## DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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