2017

Public Parks Usage Near Hydraulic Fracturing Operations

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Abstract

Following the advent of hydraulic fracturing to effectively collect natural gas and oil, there has been growing interest in placing exploration and extraction wells in or adjacent to public park and forest systems across North America and Europe. At the heart of the debate about leasing public parkland is the concern that park acreage and accessibility will be lost to fracking operations, thereby decreasing park attendance. In this study, we apply value-belief-norm theory to evaluate park users' general attitudes toward fracking and public policy and their perceptions of fracking's impact on their recreational activity. A survey of 255 park users in the Appalachian Basin of the United States indicated that individuals holding strong pro-environmental attitudes in general would likely avoid parklands that are affected by fracking operations. Additionally, a majority of respondents reported concern that fracking would disrupt park access and thusly supported legislative bans of fracking in public parklands.

Keywords: fracking, parks and outdoor recreation, leisure participation, environmental management, public policy, Appalachia

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Public parks and recreational facilities are important nodes within multi-scale community sport and recreation systems found across Europe, Australasia, and North America. In addition to offering protections to the environment and wildlife, they provide numerous opportunities to participate in sport and physical activity across skill levels and age. The programs and services offered in local, provincial–state, and national parks allow for citizens from diverse population groups to pursue sport, recreation, and leisure. The preservation and continued accessibility of these spaces—and the natural environments of which they are a part—is therefore paramount to fostering healthy lifestyles and reversing the downward trends in youth and adult physical activity and sport participation (Romagosa, Eagles, & Lemieux, 2015). Moreover, many communities near or embedded within public parks and recreation tracts rely on high rates of park participation or consumption to sustain the cultural and economic livelihood (Crompton, 2006; Eagles & McCool, 2002; Goodwin, 2002; Mayer, Mueller, Woltering, Arnegger, & Job, 2010). Put simply, these spaces are significant to a number of stakeholders.

While less apparent than park visitors and community members, energy companies are becoming increasingly active stakeholders within these areas because of the valuable pockets of natural gas that underlie many public spaces. Following a series of innovations in and wide-scale implementation of hydraulic fracturing, or fracking, to effectively collect natural gas, there has been growing interest in placing exploration and extraction wells in or adjacent to a number of public park and forest systems across Europe and North America (e.g., Cowell, 2013; Rowland & Drabold, 2014). Opponents of fracking leases on public land have argued that in addition to air contaminants (Srebotnjak, 2014) and polluted wastewater in parks (Lustgarten, 2012), park acreage will be lost to fracking operations and park attendance will decrease (Gardner, 2014).

For parks and recreation administrators, these outcomes would be especially troubling given the role that public green spaces are expected to play in reversing the decline in youth sport participation (The Aspen Institute, 2015), growing local economies through tourism and recreation-based consumption, and creating new generations of physically active recreation participants.

With these debates in mind, the purpose of this article is to explore the extent to which—if any—current and proposed fracking operations in or around designated public parks affect intentions of continued participation in recreation and physical activity in such areas. Specifically, in this study we evaluate park users' general attitudes toward fracking and public policy and their perceptions about how fracking operations impact their recreational activity. While there is a growing body of literature focused on environmental issues in leisure research, this preliminary study represents the first investigation specifically looking at park users' perceptions of fracking operations related to their decision to visit a park near a fracking operation.

Fracking and Parkland

Broadly defined, fracking refers to a stimulation technique that utilizes water, sand, and other chemicals to extract oil and natural gas from the earth. Scholarship and government research on fracking have increased in the past decade and offer some insight into the wide range of fracking's potential impacts. Important to the context of this study, Ridlington and Rumpler (2013) explain the process of fracking and how it impacts rural and parkland:

> Fracking transforms rural and natural areas into industrial zones. This development threatens national parks and national forests, damages the integrity of landscapes and habitats, and contributes to water pollution problems that threaten aquatic ecosystems.

> Before drilling can begin, land must be cleared of vegetation and leveled to accommodate drilling equipment, gas collection and processing equipment, and vehicles. Additional land must be cleared for roads to the well site, as well as for any pipelines and compressor stations needed to deliver gas to market. A study by the Nature Conservancy of fracking infrastructure in Pennsylvania found that well pads average 3.1 acres and related infrastructure damages an additional 5.7 acres. (pp. 14–15)

Additionally, they note that fracking is threatening many national parks and forests including the White River National Forest, three national parks in the Delaware River Basin, Wayne National Forest, George Washington National Forest, and Otero Mesa. Although the threat of damage to national parks is concerning in and of itself, given the link between park access and community health, it is also vital to understand how people perceive and interact with—or are affected by—fracking.

Aided by the development of horizontal extenders to vertical wells, fracking increased rapidly in the early 2000s (Rabe & Borick, 2013). As of 2013, the fracking industry had grown to include thousands of wells in 17 U.S. states (Ridlington & Rumpler, 2013). Similar rates of growth have occurred in Canada and Australia (Ingelson & Hunter, 2014). In Europe, there are currently no commercial wells, though leaders in several countries have expressed interest in investing in fracking technology—initiatives that have resulted in numerous protests and demonstrations (e.g., Gayle, 2016; Inman, 2016). Additionally, in late 2015, Members of Parliament passed controversial legislation allowing "fracking 1,200 metres below national parks and sites of special scientific interest, as long as drilling takes place from outside protected areas" (Perraudin, 2015, para. 3). Since its U.S. growth in the early 2000s, fracking has emerged as an extremely divisive issue locally, domestically, and globally. Supporters of the extraction

technique have argued that fracking is good for the economy, reduces pollution by lowering dependence on coal, and leads the country toward energy independence (Jackson et al., 2014). Opponents of fracking suggest that it contaminates water, takes support away from renewable energy sources, and releases toxins into the air (Jackson et al., 2014). The large concern from this latter group is the appearance of fracking where oil and gas production was not present previously, and the close proximity to their homes.

The perceived problems associated with fracking have been highlighted in a number of highly publicized incidents. For instance, fracking operations have led to polluted groundwater in Colorado (Finley, 2012) and contaminated drinking water in Pennsylvania (Pennsylvania Department of Environmental Protection, 2014). More broadly, fracking has been blamed for an increased prevalence of earthquakes (United States Geological Survey, 2015), higher levels of methane emission (Jackson et al., 2014), and burdening local water supplies (Nicot & Scanlon, 2012). Still, on the other hand, fracking has been shown to produce less air pollution than oil and coal (Nicot & Scanlon, 2012) and grow the U.S. economy (Engelder, 2011).

A key component of fracking to consider in this project is the perceptions of and interactions with fracking among community members in areas impacted by the activity. In many places, community members struggle to understand fracking in totality given the lack of public information (Rabe & Borick, 2013). In Boudet et al.'s (2013) survey of 1,061 individuals about their knowledge of and beliefs toward fracking, the researchers found that age was a strong predictor of support, females generally opposed fracking, conservative political ideology positively predicted support, and formal education positively predicted support. Thomas et al. (2016) conducted a meta-analysis of 55 research articles related to public perceptions toward fracking in the US and Canada and found that although the term *fracking* typically invoked

negative perceptions among individuals, the public was less certain about whether the benefits of fracking were outweighed by its risks. In this study, we similarly explore perceptions of fracking; as part of our investigation, we explore the degree to which individuals' existing environmental attitudes affect their perceptions of fracking and public park usage.

Research Hypotheses

Value-belief-norm (VBN) theory has been utilized to explain support for social movements, focusing in particular on those associated with the environment (Stern, 2000; Stern, Dietz, Abel, Guagnano, & Kalof, 1999). As Stern et al. (1999) explained, "The base for general movement support lies in a conjunction of values, beliefs, and personal norms—feelings of personal obligation that are linked to one's self-expectations (Schwartz, 1977)—that impel individuals to act in ways that support movement goals" (p. 83). The prevailing rationale behind Stern et al.'s (1999) extension of Schwartz's theory is that actions are activated by moral norms. An example of this concept could be found in an individual's recognition that harm to the environmental has consequences (i.e., awareness of consequences) and that actions the individual takes could help those consequences be avoided (i.e., ascription of responsibility to self).

In sum, VBN theory encompasses several conceptual approaches, including the universal theory of human values (Schwartz & Bilsky, 1987) and the theory of norms activation (Schwartz & Howard, 1981). As described by Casper, Pfahl, and McCullough (2014), VBN explains pro-environmental behavioral intentions through the activation of personal norms. These norms are influenced by an individual's beliefs toward the consequences of her actions, which ultimately provoke an ascription of personal responsibility.

Based on the theorized relationship between values, beliefs, norms, and behaviors (operationalized in this study as an individual's response to the perception that a fracking

operation will impede her or his ability to access and/or enjoy a public park), several research hypotheses were developed to guide this study. In particular, we endeavored to understand how one's values, beliefs, and norms would impact future behavior in the context of fracking in or near public parklands. The theorized behaviors included continued visitation of the park (i.e., no change to visitation behavior) and the pursuit of alternatives (such as traveling to a different park unaffected by fracking operations).

H_1: Values are positively related to beliefs (H_{1a}), personal norms (H_{1b}), and the pursuit of alternatives (H_{1c}). Values are negatively related to continued visitation (H_{1d}).

H_2: Beliefs are positively related to personal norms (H_{2a}) and the pursuit of alternatives (H_{2b}), while beliefs are negatively related to continued visitation (H_{3c}).

H_3: Personal norms are positively related to the pursuit of alternatives (H_{3a}), and negatively related to continued visitation (H_{3b}).

Method

To examine perceptions that a fracking operation could disrupt public park access and usage, an online survey was developed and administered to park users in the Appalachian US. The sections below detail the processes through which the survey instrument was developed and piloted, participants were recruited, and data were analyzed.

Measures

The instrument contained a combination of items existing from previous instruments and newly generated items. The instrument was arranged into eight sections in which participants responded to questions related to park usage activity, biospheric values (Steg, Dreijerink, & Abrahamse, 2005), beliefs about the natural environment and humanity's relationship to it (New Environmental Paradigm, or NEP; Dunlap, 2008; Dunlap & Van Liere, 1978), personal norms

(Casper et al., 2014), attitudes toward fracking and public policy, attitudes toward fracking and park usage, and demographics. Additionally, participants were invited to provide open-ended comments at the survey's conclusion. In total, the survey contained 64 items, though not all items were applicable to the findings reported in this article. A full list of the items is provided in Table 2.

Sampling

To examine park users' attitudes toward the environment and fracking, a purposive sampling technique was used. An online survey was distributed to park users in the Appalachian Basin of the eastern US; this region was selected because it is home to a number of state and national parks currently considering or having already consented to fracking wells (National Parks Conservation Association, 2013; Yeoman, 2013). Participants were solicited using a survey-research service that operates mostly traditional, actively managed market research panels. In order to qualify for the survey, respondents had to satisfy two criteria: (1) they must have visited a public park (e.g., local, state, or national) at least once in the past year and (2) they must have lived in Pennsylvania, Ohio, West Virginia, Kentucky, or Tennessee. In addition to the screening questions, location and park usage were checked based on participants' geoIP data and their responses to an item asking them to list their favorite public park, respectively.

Results

A total of 255 individuals representing five Appalachian states received and completed the survey in its entirety. The sample included self-identified Pennsylvanians (42%), Ohioans (28%), Tennesseans (13%), Kentuckians (13%), and West Virginians (3%). Most respondents categorized their community as suburban (52%), followed by rural (26%) and urban (22%). The median age of the sample was 45, and more than half were female (58%, compared to 42%

male). Less than half of respondents (44%) held a bachelor's degree or higher, and the average family income fell between $50,000–$74,999. Political affiliations were 42% Democrat, 33% Republican, and 25% something else. Finally, a large majority considered themselves to be either active or passive environmentalists (62%), while 35% did not.

Table 1 includes a profile of respondents' park usage, attitudes toward the environment, and knowledge of fracking. Each survey taker reported visiting a local, state, or national park at least once per year, with more than 40% visiting at least once per month. The most popular type of park was local (46%), then state (41%), then national (13%). The most popular park activities were relaxation, picnicking, and running or walking for fitness. Nearly 90% of respondents reported having heard of the terms "hydraulic fracturing" or "fracking" prior to completing the survey, with more than 60% reporting at least some familiarity with the term. About one-third of the sample (32%) lived in a region where fracking was currently occurring or was expected to occur in the near future. The majority of respondents (64%) had not received any direct benefit from a fracking operation. Finally, most respondents indicated they opposed the use of fracking to collect oil and gas: 40% were either strongly or somewhat opposed, while just over 22% were either strongly or somewhat supportive. Another one-quarter of respondents were neutral (neither favorable nor unfavorable), and 11% were unsure.

[Insert Table 1 about here]

The means and standard deviations of each item as well as for the respective constructs are shown in Table 2. Overall, the sample reported high biospheric values. Within the NEP constructs, the balance of nature was viewed as most important (M=4.18), while beliefs that there are limits to natural resources was reported as the least important (though even this construct mean exceeded the scale mean; M=3.71). The majority of respondents felt they had a personal

responsibility to protect natural resources and that fracking would affect their future visitation to parks.

CFA and reliability statistics are also shown in Table 2. The CFA of the model was based on 26 observed measures and seven latent constructs. In addition to model fit, construct reliability (CR) and average variance extracted (AVE) were calculated. All observed variables showed acceptable factor loadings and the constructs provided evidence of discriminant and convergent validity. The overall chi-square statistic for the measurement model was significant (χ^2 (253) = 486.39, $p < .001$). The RMSEA statistic (.06) met the acceptable standard, while CFI (.94) and TLI (.93) were slightly below current recommendations. Recent studies suggest traditional fit criteria (which our statistics fit) may be inadequate measures; for instance, Hooper, Coughlan, and Mullen (2008) advised using .07 as an upper-limit cutoff for the RMSEA statistic and .95 as the minimum statistic for CFI and TLI. While most metrics met or closely approached accepted standards, it may nevertheless be necessary to reevaluate model specification and fit in subsequent studies.

[Insert Table 2 about here]

Through structural model analysis, we examined the hypothesized relationships between the latent constructs, the results of which are illustrated in Figure 1. As shown in the model, all standardized regression paths were significant. First, the direct paths from biospheric values to beliefs (λ = .80; 95% CI = .44, .68), personal norms (λ = .68; 95% CI = .56, .86), the pursuit of alternatives (λ = .33; 95% CI = .25, .65), and continued visitation (λ = -.13; 95% CI = -.38, -.05) were significant in the expected directions, thereby providing support for H_{1a}, H_{1b}, H_{1c}, and H_{1d}, respectively. Next, the paths from beliefs to personal norms (β = .85; 95% CI = .99, 1.59), the pursuit of alternatives (β = .41; 95% CI = .65, 1.21), and continued visitation (β = -.16; 95% CI =

-.38, -.05) were significant in the expected directions; as a result, H_{2a}, H_{2b}, and H_{2c} were not shown to be false. Finally, the direct paths from personal norms to pursuit of alternatives (β = .48; 95% CI = .52, .92) and continued visitation (β = -.19; 95% CI = -.52, -.07) were significant in the expected directions, thereby providing support for H_{3a} and H_{3b}, respectively. Collectively, 61.5% of the variance in the personal norms construct was predicted by biospheric values and beliefs. Furthermore, the hypothesized predictors in the model explained 36.3% of the variance in pursuit of alternatives, and 23.7% of the variance in continued visitation. Additional analyses investigating the possibility that an individual's attitudes toward fracking on parkland (i.e., pursuit of alternatives and continued visitation) could be influenced by (1) the type of park most often visited by the individual or (2) the individual's park visitation frequency showed no significant differences.

The overall chi-square statistic for the structural model was significant (χ^2 (268) = 636.814, $p < .001$). Other indices (CFI = .91; TLI = .90; RMSEA = .07) provided mixed evidence of model fit, as discussed previously. In line with VBN theory, the flow "downstream" reflects personal norms as the strongest predictor of behaviors (i.e., visit and access), followed by beliefs, and then values.

[Insert Figure 1 about here]

Discussion

The results of this study provide some perspective on how the introduction of hydraulic fracturing operations into or near public spaces of play may impact park usage. Park users who participated in this survey expressed concern that their ability to access and enjoy their favorite local, state or provincial, or federal parks systems could become hindered if nearby land was to be leased for natural gas exploration and extraction. While it is somewhat unclear *why* park users

might have this suspicion, their survey responses yield some insight. Although some park users may believe their access to a park could become limited due to increased traffic or park closures, there is some evidence to suggest park users would avoid parks near fracking operations out of personal preference: 38% disagreed with the statement "I am willing to participate in recreational activities near a fracking operation," and 56% indicated they were "willing to travel further to visit a park that was not affected by fracking operations."

This finding suggests respondents prefer that fracking activities occur away from places they enjoyed, giving credence to the idea that overall people may support an activity for economic or other purposes so long as it is "not in my backyard" (NIMBY; Boudet et al., 2014). Previous research on the NIMBY phenomenon has shown that people are less supportive of energy development when it occurs in close proximity to where they live (Boudet et al., 2014). However, Boudet and colleagues noted that previous research has not provided a comprehensive examination of all forms of energy development. For example, Jaquet (2012) found that an individual's support for wind turbines was directly related to her or his proximity to the turbine; however, this relationship was contrary to the expected NIMBY outcome. That is, the closer an individual lived to the turbine, the more supportive the individual was of wind turbine energy development. Therefore, Boudet and colleagues emphasized the vital importance of examining energy development from the perspective of a person's emotional or psychological attachment to a particular place.

Therefore, examining particular places that are important to an individual's recreation activities, coupled with said individual's environmental orientation, provides insight into the way environmental disruptions can impact recreation decisions. The results of this study support previous empirical findings that indicate a connection between biospheric values and beliefs,

personal norms, and behaviors. Similar to Steg and colleagues (2005), our findings suggest a causal order from general environmental values, beliefs, and norms to specific behaviors—in this case, the decision to participate in recreation activities at preferred parks near fracking operations.

As noted earlier, park usage has been tied to many social, economic, and health outcomes, including disease prevention (Sallis, Floyd, Rodríguez, & Saelens, 2012) and increased physical activity among adolescents (Floyd et al., 2011; Suau, Floyd, Spengler, Maddock, & Gobster, 2012) and older adults (Pleson et al., 2014). As a result of these projected benefits, advocates have pushed for increasing public support to expand recreation resources (Casper, Bocarro, Kanters, & Floyd, 2011; Edwards, Jilcott, Floyd, & Moore, 2011). As Baker, Schootman, Kelly, and Barnidge (2008) noted, in order for such positive benefits to be realized, community spaces must be accessible and well attended by the public. The findings of this study suggest that fracking operations could, at the very least, alter an individual's decision and ability to participate in recreational activities. These findings have very real implications for both individuals attempting to participate in recreation activities and policymakers.

In recent years, state legislatures, state-level permit granting agencies (such as the Pennsylvania Department of Environmental Protection or the North Carolina Department of Environment and Natural Resources), and local municipalities have increasingly sought to liberalize fracking operations near public park and recreation spaces. While there is fairly concrete evidence that fracking operations are likely to introduce negative environmental and ecological effects to a region—in the form of high proximal water consumption, water contamination, erosion, destabilization of substrate shale formations, and increased noise pollution—the prevailing logic in both federal- and state-level policymaking and public spheres

has been oriented around job creation, positive economic impact, and national natural resource independence. However, this study illustrates that fracking holds the potential for negative social, health, and economic effects, whereby negative perceptions of fracking operations' effect on parkland could lead to decreased participation in these park spaces—and thus lower social, economic, and health benefits that would otherwise come with sustained park usage. Therefore, when considering whether to open public land for fracking exploration, stakeholder groups and governing bodies should consider these additional—and largely uncounted—costs. Beyond the environmental costs, this study suggests that decreases in park activity based on negative perceptions of nearby fracking operations could lead to higher rates of negative health outcomes and erosion of communities where park-based tourism is a central part of the local economy.

Given the exploratory nature of this study, there are a number of limitations to acknowledge and consider for future research. First, park users participated in the study via online survey; as a result, the sample is limited to individuals with internet access. Similarly, the convenience sampling method used for this study limits our ability to generalize the data across an entire population of park users in Appalachian states. Second, of the 255 participants in the study, 10% of respondents were not familiar with the term *hydraulic fracturing*, and therefore, their attitudes may have been informed by limited information and/or instinct. Third, we did not utilize in-depth probing techniques to identify why survey takers responded to certain questions in the manner they did. Finally, because we were interested in learning about park users' attitudes toward fracking in public parkland, we encourage individuals to exercise caution when making inferences about the *actual role* park-proximate fracking activities plays on park usage—additional analyses of park attendance figures are necessary.

These facts are especially important to acknowledge when considering the highly

contentious sociopolitical debates on fracking in public parklands. As discussed above, fracking opponents may continue to promote the perception already held by many park users: that fracking is unsafe, harmful to the natural environment, and disruptive to citizens' lives. Conversely, fracking supporters may continue to engage the public to counter such perceptions, particularly by pursuing projects that are seldom seen by parkgoers (and then promoting projects as such).

These limitations should be considered as researchers continue to evaluate the impact of hydraulic fracturing and public land leases on leisure, recreation, parks, and the environment. Given that a majority of park users in this study indicated their reluctance to engage in recreational activities near fracking operations, researchers should identify locations in which such interactions occur and examine the extent, if any, to which park attendance has changed. Regardless of the actual change in attendance, the contradictory nature of fracking and parks (i.e., balancing fracking's perceived economic benefits with its perceived harm to the natural environment) poses challenges for both energy operators and park officials, who must continue to work toward safe and efficient solutions that minimize their impact on park users.

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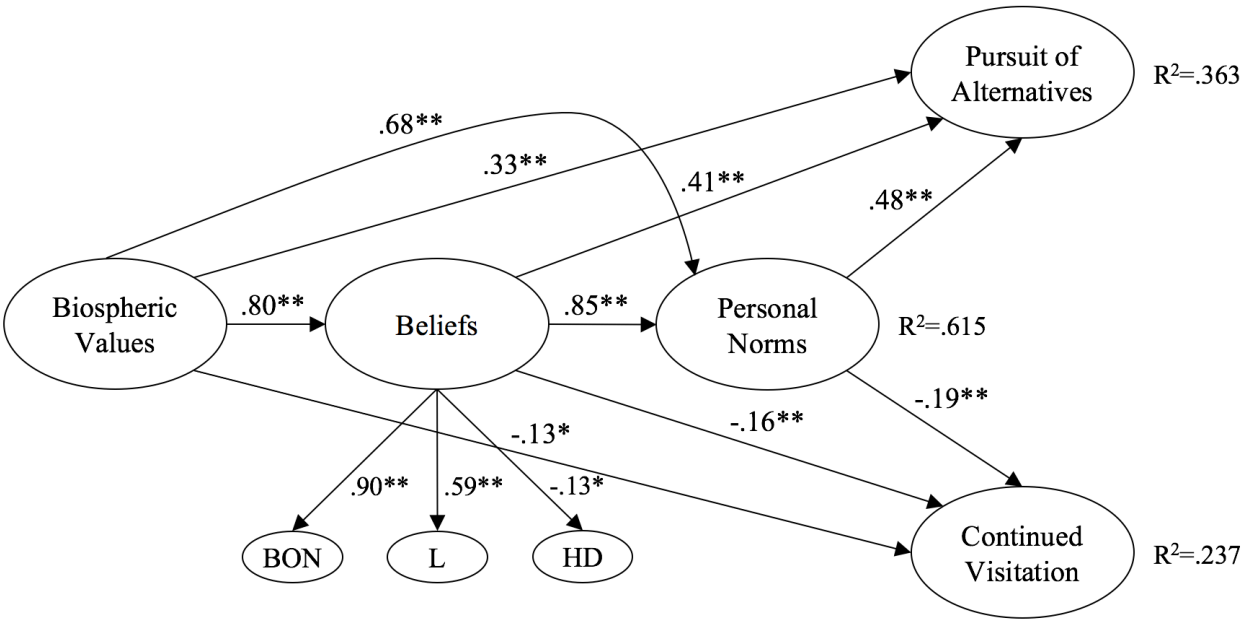

Figure 1. Structural model analysis of the VBN model. BON = balance of nature; L = limits; HD = human domination.
* $p < .05$; ** $p < .01$.

Table 1

Park Usage, Attitudes Toward the Environment, and Familiarity with Fracking Activity

	N	%
Average Park Visitation		
Once per year	20	7.8%
A few times per year	124	48.6%
Once per month	47	18.4%
Weekly	50	19.6%
Every other day	6	2.4%
Daily	8	3.1%
Type of Park Most Often Visited		
Local	118	46.3%
State	104	40.8%
National	32	12.5%
Considers Her or Himself to be an Environmentalist		
Yes, ACTIVE environmentalist	29	11.4%
Yes, PASSIVE environmentalist	128	50.2%
No, not an environmentalist	90	35.3%
No answer	8	3.1%
Familiarity with *Hydraulic Fracturing (Fracking)* Term		
Never heard of	26	10.2%
Heard before, but not at all familiar	39	15.3%
Not very familiar	19	7.5%
Neither familiar nor unfamiliar	14	5.5%
Somewhat familiar	112	43.9%
Very familiar	45	17.6%
Living in a Region Where Fracking Currently Occurs or is Expected to Occur in the Near Future		
Yes	82	32.2%
No	73	28.6%
Unsure	100	39.2%
Has Received Direct Benefit from Fracking		
Yes	9	3.5%
No	164	64.3%
Unsure	82	32.2%
General Support of or Opposition to Use of Fracking in Extraction of Fossil Fuels		
Strongly Oppose	46	18.0%
Somewhat Oppose	56	22.0%
Neither Oppose Nor Support	64	25.1%
Somewhat Support	38	14.9%
Strongly Support	19	7.5%
Unsure	32	11.0%

Table 2

Item and Construct Descriptive Statistics, CFA Loadings, and Reliability and Validity Statistics

Constructs, Items, and Scaling	M	SD	λ	CR	AVE
Values (5 pt.)	**4.14**	**0.95**		**0.94**	**0.80**
Protecting the environment: preserving nature	4.15	1.01	0.91		
Respecting the earth: living in harmony with other species	4.17	1.05	0.94		
Preventing pollution	4.26	0.94	0.86		
Unity with nature: fitting into nature	3.97	1.11	0.88		
Beliefs About Environmental Balance (5 pt.)	**4.18**	**0.75**		**0.77**	**0.49**
The balance of nature is very delicate and easily upset	4.13	0.98	0.77		
When humans interfere with nature it often produces disastrous consequences	4.04	1.05	0.59		
Humans must live in harmony with nature in order to survive	4.42	0.83	0.67		
Humankind is severely abusing the environment	4.18	1.04	0.64		
Beliefs About Environmental Limits (5 pt.)	**3.71**	**0.90**		**0.79**	**0.60**
We are approaching the limit of the number of people the earth can support	3.51	1.14	0.76		
The earth is like a spaceship with only limited room and resources	3.92	1.06	0.80		
There are limits to growth beyond which our industrialized society cannot expand	3.71	1.02	0.69		
Beliefs About Human Domination (5 pt.)	**3.40**	**1.05**		**0.79**	**0.50**
Humans have the right to modify the natural environment to suit their needs	3.46	1.27	0.54		
Humankind was created to rule over the rest of nature	3.29	1.45	0.81		
Plants and animals exist primarily to be used by humans	3.49	1.33	0.89		
Humans need not adapt to the natural environment because they can remake it to suit their needs	3.73	1.29	0.48		
Personal Norms (7 pt.)	**5.72**	**1.05**		**0.89**	**0.63**
Conserving natural resources is important to me	6.04	1.07	0.90		
I have a responsibility to conserve natural resources	6.01	1.10	0.94		
I would be willing to pay higher prices to protect the environment	4.94	1.59	0.61		
I feel that I should conserve natural resources at a park or recreational facility	6.02	1.12	0.79		
I would be willing to be inconvenienced to help conserve natural resources at a park or recreational facility	5.57	1.42	0.67		
Pursuit of Alternatives (7 pt.)	**4.83**	**1.52**		**0.87**	**0.68**
I am willing to travel further to visit a park that was not affected by fracking operations	4.78	1.61	0.88		
I am concerned that a fracking operation will limit access to my park in the future	4.68	1.82	0.80		
I support legislation that would prohibit fracking operations near my preferred public park	5.02	1.75	0.80		
Continued Visitation (7 pt.)	**3.67**	**1.71**		**0.89**	**0.80**

I am willing to participate in recreational activities near a fracking operation	3.85	1.85	0.95
I would encourage others to participate in recreational activities near fracking operations	3.49	1.77	0.84

Note. λ = standardized factor loading. CR = construct reliability. AVE = average variance extracted.