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Ending America's Dependence on Foreign Oil: Risk Perceptions among Texans

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ENDING AMERICA'S DEPENDENCE ON FOREIGN OIL: RISK
PERCEPTIONS AMONG TEXANS

A Thesis
Presented to
The Faculty of the Department of Sociology
Western Kentucky University
Bowling Green Kentucky

In Partial Fulfillment
of the Requirement for the Degree
Master of Arts

Jessica R. Aldridge

May, 2009

ENDING AMERICA'S DEPENDENCE ON FOREIGN OIL: RISK
PERCEPTIONS AMONG TEXANS

Date Recommended__April 16, 2009__

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**ENDING AMERICA'S DEPENDENCE ON FOREIGN OIL: RISK
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Reliance on foreign oil is a major problem facing the United States due to uncontrollable prices, dealing with hostile nations, and oil wars. Demographic variables, risk perception, community attachment, environmental knowledge, and environmental attitudes of Texans were examined to determine which factors influence attitudes toward the hard- and soft-energy path for ending the U.S. Reliance on foreign oil. The data for this study were collected through a mailed questionnaire which included 1,228 Texans in 12 counties over three ecological regions. The dependent measures, hard-energy path and soft-energy path, were regressed on the independent and control variables to determine which factors influenced energy-path preference. The results of the data analysis of Texans clearly demonstrated that environmental attitudes, and in the end,

knowledge of energy solutions are the most powerful predictors of risk perception.

CHAPTER I

INTRODUCTION

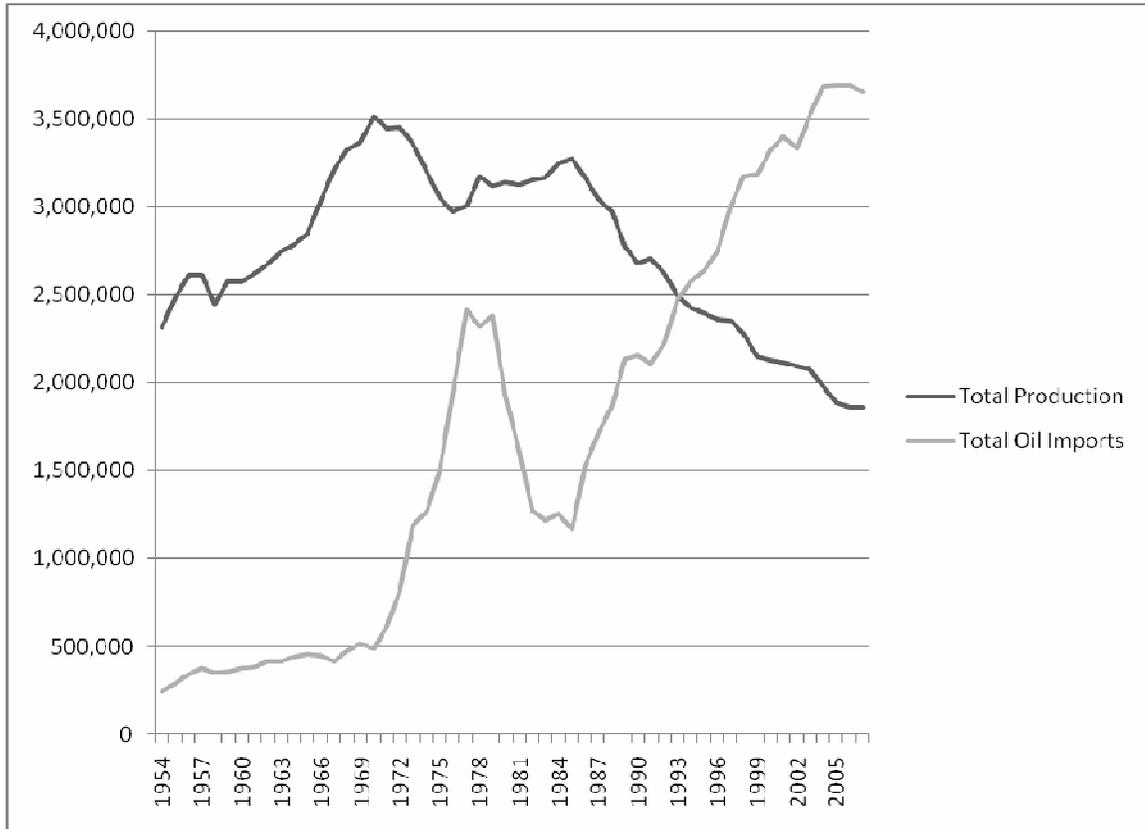
Ordinary human beings simply do not see that they are part of a delicate web of life that their own actions are destroying (Ophuls 1977:233).

M. King Hubbert predicted that the United States would extract more than half its available domestic oil supply between 1965 and 1970 (Hubbert 1956). Looking at Figure 1, one notices that his prediction was not far from the mark. Domestic oil production in the United States began to decline in 1972 just as demand was increasing tremendously (Klare 2005:10). The diminished supply of domestic oil coupled with the increased demand has led to an ever-growing dependence on imported foreign oil (Klare 2005:10).

Reliance on foreign oil is a major problem facing the United States. It means that the United States either has to compete in the marketplace against other countries to purchase oil from potentially hostile countries (which, of course, drives the price up) or engage in military action (e.g., gunboat diplomacy or military invasion) to ensure a steady oil supply (Le Billon and El Khatib 2004).

Reliance upon foreign oil leaves the United States

Figure 1. U.S. Oil Production and Imports 1954-2007 (U.S. Department of Energy 2007).



vulnerable to supply disruptions overseas and with no control over prices, not to mention the 3.5 trillion dollars of expected revenue to be spent on foreign oil over the next two decades (Klare 2005). Klare also pointed out that major oil suppliers often expect political favors beyond the payment of oil, which continues to jeopardize our national security in oil wars. These oil wars often entail turbulent situations with religious or political factions in foreign nations who despise the American military presence in their nation (Klare 2005:10).

The United States has recognized that dependence on foreign oil is a problem; however, the solutions to that problem remain both very elusive and very important. Thomas Friedman (2008) stated that new energy technologies are anticipated to be the next great global industry that could solve the energy crisis confronting the United States. Friedman suggested that whichever nation embraces an energy revolution will lead the world in energy security, economic security, competitive industries, and global respect for the future (Stewart 2008).

Hard- and Soft-energy paths

Societies can follow two paths to fulfill their energy needs. The first path is a hard-energy path that consists of exploiting nonrenewable resources such as gas and oil, coal, and nuclear technology. If the United States can be said to have a cogent energy policy, then this policy is the current energy path in the United States (Lovins 1978). The problem with this path is that, once these energy sources have been depleted, they are gone.

The other path that can be taken to alleviate the societal demands for energy is the soft-energy path. The soft-energy path presents:

An alternative future where efficiency and renewable energy sources steadily replace a centralized energy system based on fossil and

nuclear fuels (Rocky Mountain Institute 2008 para. 6).

Soft technologies are much simpler and have a higher rate of success than do the large-scale hard technologies (Lovins 1978). Simpler technology would mean that fewer skilled laborers are required to maintain the energy system. In his evaluation of hard- and soft-energy paths, Lovins argued that the soft-energy path needs only access to capital and relaxed institutional barriers to become a valued commodity on the market. Those conditions may now be possible.

The hard- and soft-energy paths are important ideas because American society has a choice to make. As individuals, communities, states, and a nation, we must weigh the perceived risks and benefits of these energy paths. This paper is an endeavor to explain what factors influence attitudes toward hard and soft energy for ending U.S. reliance on foreign oil. I explored how demographic variables, environmental attitudes, risk perception, and community attachment influence preference for the hard or soft paths.

CHAPTER II

THEORETICAL PERSPECTIVE

There are several risks and benefits associated with each energy path. Moreover, risks are perceived differently by different people. Several different theories have been posited concerning the social construction of risk perception. They include the theories of risk discounting, knowledge, economic, and postmaterialism. Risk and environmental attitudes will also be examined from the interactionist approach to community.

Risk Discounting

Risk discounting suggests that Americans feel as if they have a lesser chance of encountering risk than other people (Sjoberg 2000). "The best established results of risk research show that individuals have a strong but unjustified sense of subjective immunity" (Douglas 1985:29). This phenomenon of subjective immunity occurs for men and women and all age groups (Weinstein 1987). Leiserowitz (2006) found that 92 percent of Americans believed that global warming is real. Those same people, who were less concerned about local impacts of climate

change, felt the dangers of global warming would affect distant places and people. Leiserowitz concluded that Americans will not make the environment a top priority until they personally feel at risk to climate changes.

Religious beliefs and attitudes have a strong, negative impact on environmental policy, and secular Americans have a more environmentally friendly attitude (Guth, Green, Kellstedt, and Smidt 1995). Guth et al. also discovered that conservative eschatology (interpreting the Bible literally) had the strongest and most significant negative, relationship with environmental perspectives. They concluded that religious tradition and religious commitment also have strong bivariate associations with environmentalism (Guth et al. 1995).

Knowledge Theory

The knowledge theory of risk perception states that people perceive technology to be dangerous because they have either observed or experienced it to be dangerous (Wildavsky and Dake 1990). For example, many Americans fear nuclear power plants because they know nuclear power to be dangerous due to previous nuclear disasters. Yet, some Americans have no fear of nuclear disaster at all. In addition, environmentalism is diminishing among younger age groups (Greenberg 2004). Now, a new generation of Americans

exists that never encountered a technological catastrophe like Three Mile Island, which threatened human society on a large scale. It is hard to understand the magnitude of that kind of negative technological destruction of the environment, or perception of destruction as with Three Mile Island, without experiencing the events first-hand as a generational event.

People who rate their self-knowledge of technologies to be high perceive greater benefits than people who have little technological knowledge (Wildavsky and Dake 1990). According to them, people cannot fear risks about which they do not know. If Americans believe the fuel they consume is an endless resource and the foundation of the national economy, they cannot understand the consequences. In a study of environment and behavior concerning car use, Steg and Sievers (2000) discovered that the higher respondents rated their knowledge of environmental problems, the fewer kilometers they drove. On the other hand, those respondents who had little knowledge of environmental problems drove without considering environmental consequences.

Some Americans are going to be looking at the oil crisis from their perspective: a hard-energy path is all they know, the national economy is based on oil, it is

working for now, drilling for more oil will solve any problems, and technology will save us from any danger of disruption of energy consumption. Other Americans, supporting a soft-energy path, will see the energy crisis as a warning that resources are depleting, ignoring the problem will not make it go away, and the economy could profit from a change in energy path and a solution to an energy deficiency.

The United States must learn to retrofit sustainable technologies to an existing infrastructure founded on a hard-energy path. Switching energy paths when there is no sustainable infrastructure is more difficult. There is also a cultural inertia among people who like things done the way they have always been done; it is less risky to stay with what they know. Also, people want to avoid risks rather than pursue chances (Sjoberg, Moen, and Rundmo 2004).

Knowledge theory suggests that people will worry about the most immediate threats to their well-being. The immediate well-being of many Texans is an economy based upon a hard-energy path. Knowledge theory has a minimal relationship to risk perceptions overall (Wildavsky and Dake 1990).

Economic Theory

The economic theory of risk perception states that the affluent are more likely to take risks because they profit from them. The affluent also have the means to recover if they gamble and lose on risks (Wildavsky and Dake 1990). When environmental risks are presented as gains, rather than losses, those risks are much more likely to be accepted by the community (Gattig and Hendricks 2007). New energy sources promise jobs, sustainability, and revenue.

Old habits plus old technology have predictable consequences. Old habits that are hard to change, plus new technology can have dramatically altered consequences. (David, Bender, and Zurns 2006)

The risk to the economic structure of the community is a common, hindering fear when contemplating switching from a hard-energy path to a soft-energy path. Seeing the benefits of a soft-energy path immediately is difficult due to the high initial costs of building green. It is also important to consider that green technologies will become more affordable as they become more widely used. When the public begins to demand sustainable resources and invests in them, the costs will go down for everyone.

Gattig and Hendricks (2007) also pointed out that environmental risks are created by the economically well

developed countries and the consequences are more likely to affect poorer nations, which lack resources to take preventative measures.

Postmaterialism Theory

Postmaterialism also affects how people perceive risks. Inglehart (1977, 1990) theorized that post-World War II generations worry less about materialism and more about civil liberties and quality of life.

According to Maslow's (1948) Hierarchy of Needs, members of society must meet their basic needs by obtaining food, shelter, water, and safety before they can go on to create arts and self-actualization. Postmaterialism suggests that post-World War II generations no longer worry about acquiring the basic needs of life. Those needs have been met, and new generations worry about postmaterialist issues such as opposition to nuclear power, the women's movement, and the environment (Carlisle and Smith 2005, Inglehart 1987). Inglehart suggested that generational differences affect environmental attitudes.

Community is an important variable in environmental risk perception because people decide things in groups. Research also shows that demographic variables, political affiliation, level of education, adherence to the New Ecological Paradigm or Dominant Social Paradigm, and self-

rated level of knowledge of technologies also have weak correlations to perceptions of risk (Jones and Dunlap 1992; Van Liere and Dunlap 1980; Wildavsky and Dake 1990).

Clearly, risk perception is based on multiple variables that cannot be studied within a single discipline. Community is created through discussion, and risks are determined through those discussions.

Interactionist Approach to Community

It is not accurate or appropriate to treat the environment as though it were somehow separate from the social life it supports. An active interdependency characterizes the relationship between social life and its surroundings.
(Wilkinson 1991:68)

According to Wilkinson (1991) a community consists of three elements. First, a community is composed of a territory where people live and meet their daily needs. Second, a community includes an extensive interactional structure that organizes social life to meet needs and express common interests. Third, a community will have a bond of local solidarity expressed through community action. Community is created through discussion and a dynamic process of interdependent parts all interacting with one another.

A social world is defined as groups joined by at least one primary activity, or goal, within a social network

(Smith 1996). A social world is also defined by common concerns and activities within a network. The new pledge of sustainability has also created the breeding ground for new social worlds to form as thought to be possible.

Unruh (1980) theorized that social worlds can escalate into "grand scenes," or important lifestyle forms. Strauss (1978) stated that social-world interaction is different from face-to-face interaction due to the use of technology and formal organizations emerging to represent the social world. The new social world forms when a community begins to use new, alternative technologies such as implementing a new wind farm and building with only sustainable resources. New organizations form to represent green interests via partnerships with green-minded, nonprofit organizations and donations with information, resources, and support to build green (Greensburg GreenTown 2008).

Kaufman (1959) theorized that there were two major recurring themes present during community improvement and development. First, the community focuses on improving material conditions of their lives. Success is measured by technical gains and economic growth. Second, the community focuses on developing groups of strong community members to solve problems.

CHAPTER III

LITERATURE REVIEW

Many factors may affect why people favor one path over the other path. Little is known about the social bases of energy preferences; however, much is known about the social bases of environmentalism. The Cerrell Associates, Inc. (1984) demonstrated that hard-path waste-to-energy facilities were more likely to be opposed by liberal and more highly educated individuals and more likely to be supported by older conservatives who live in lower socioeconomic neighborhoods. In 2005 The Gallup Organization discovered that another hard-energy source, nuclear energy, was supported more by men and Republicans, while Democrats and women were less supportive (Gallup and Newport 2005). Age, political affiliation, level of education, and sex are common variables evaluated for levels of environmental concern.

Age is often the strongest demographic factor that influences support regarding environmentalism. Historically it has been the young cohort, rather than the older, that has been more concerned with the environment (Carmen 1998;

Cottrell 2003; Dunlap and Mertig 1997; Jones and Dunlap 1992; Tognacci, Weigel, Wideen, and Vernon 1972; Van Liere and Dunlap 1980). Van Liere and Dunlap (1980:183) stated that, "the predominant finding has been that age is negatively correlated with environmental concern." Greenberg (2004) found, however, that support among the older population is growing while diminishing among the younger age groups. Greenberg suggested the change in environmental support among the youth might be a result of the current young generations not seeing the environmental degradation and pollution of the 1960s and 1970s first hand (Greenberg 2004).

A second key demographic variable that remains consistent with a higher level of support for environmental issues is political affiliation. Individuals reporting a Democratic or liberal political affiliation are routinely more pro-environmental than are Republicans and conservatives (Carmen 1998; Constantini and Hanf 1972; Dunlap 1975; Dunlap and Gale 1974; Greenberg 2004; Jones and Dunlap 1992; Mitchell 1978; Tognacci et al.; Van Liere and Dunlap 1980, Dunlap 2008, Newport 2008).

Still, a few studies have failed to find any significant correlation between various political affiliations and environmental concern (Buttel 1972;

Dillman and Christenson 1972; Munton and Brady 1970). The failure of finding any significant correlation could be due to Dunlap's (1975) discovery that if conservatives perceive an ecological catastrophe as a real possibility, the levels of pro-environmentalism are just as high as those of Democrats and liberals. Dunlap concluded:

If environmentalists are able to convince people that environmental degradation is indeed a serious threat, then [environmentalists] may be able to mobilize wide segments of society-- including those such as Republicans and conservatives who appear ideologically predisposed against pro-environmentalism. (Dunlap 1975:449)

Carmen (1998) also agreed that environmental concern demonstrated by individuals is determined by how those individuals evaluate the actual condition of the environment.

The third demographic variable that affects an individual's level of concern regarding the environment is the education the individual has achieved. Previous research results have concluded that well educated individuals are more likely to be concerned with the environment than are their lesser-educated counterparts (Carmen 1998; Cottrell 2003; Dunlap and Mertig 1997, Freudenburg and Gramling 1993, Greenberg 2004, Jones and Dunlap 1992, Tognacci et al. 1972; Van Liere and Dunlap

1980).

The last demographic variable that commonly affects environmental concern is sex. Previous research has conflicting results regarding the sex variable. Men are more likely than women to support stricter environmental regulations (Greenberg 2004, Smith 2001a), while women are often more environmentally concerned than men in general (Blocker and Eckberg 1989; Bord and O'Connor 1997; Jones and Dunlap 1992). Men are more likely to engage in outdoor recreational activities and, therefore, are more likely to be environmentally knowledgeable. Women are more likely to be concerned with pollution effects on their families and believe in environmental exploitation (Smith 2001a). Women engage in more personal environmental actions because they are more likely to be in charge of household duties such as recycling and purchasing organic foods (McStay and Dunlap 1983, Smith 2001a). Jones (2008) found that women were making major changes to live in a more environmentally friendly attitude more than men.

Smith (2001b) found that sex was not directly related to environmentalism, while attitudes toward feminism had a positive, direct correlation with environmentalism. Smith (2001b) discovered that sex must be related to specific environmental concerns rather than overall environmentalism

once feminism is controlled on measures of environmentalism. Smith (2001b) concluded that the strongest predictors of environmentalism are different for each sex. Self-reported political ideology is usually the most important indicator. Feminism is always the most important indicator for women. Other studies have found that sex is an inconclusive indicator of environmental support (Greenberg 2004; Van Liere and Dunlap 1980).

Another consideration is which ecological worldview individuals believe to be true. The first worldview is the Dominant Social Paradigm (DSP). The DSP states that man is meant to rule and dominate over nature and any problems will be solved by human ingenuity. The New Ecological Paradigm (NEP) states an opposing worldview. Instead of dominating, man is just another species subject to the laws and limitations of nature. Resources are finite and humans can and do affect the natural environment (Dunlap 1989; Dunlap and Van Liere 1978; Dunlap, Van Liere, Mertig, Catton, and Howell 1992; Milbrath 1981).

Van Liere and Dunlap (1980) stated that Americans are socialized to accept the DSP, but these individuals are introduced to the NEP ideas of balance, growth limitations and antianthropocentrism. Those individuals following the DSP ideology strongly feel that human technology will

overcome any energy crisis (Anderson and Lipsey 1978; Richman 1979) because technology is creating the environmental problems and will resolve those problems as they arise (Donahue, Olien, and Tichener 1974; Tichener, Donahue, Olien, and Bowers 1971).

After reviewing the literature, I hypothesize that Texas individuals who are more pro-environmental are going to be young, be well-educated, be of liberal or Democratic political affiliation, and will also most likely be female. Further, I hypothesize Texas individuals who are older, less educated, of Republican or conservative political affiliation, and male will be less interested in environmental causes. I hypothesize that individuals who believe in the DSP ideology will be more supportive of a hard-energy path as they will firmly believe technology will solve any environmental problems. Those individuals who believe in the NEP ideology will be supportive of a soft-energy path.

CHAPTER IV

RESEARCH METHODS

The data for this study were collected through a mail questionnaire in the spring of 2008. Theodori and Lyke-Ho-Gland surveyed 1,228 Texans in 12 counties over three ecological regions: the Texas coastal wetlands, hardwood forests, and desert ecosystem. The data were collected using a modified Tailored Design Method (Dillman 1999). (For more information on methodology see "Energy Resources and Natural Environments Survey of Texans: An Illustrative Summary" [Theodori and Lyke-Ho-Gland 2008]).

Tables 1 through 4 compare the samples drawn from each county with their respective county populations with respect to median age, sex, and level of education to check for potential sample bias. Table 1 examines the median age of the county samples. As can be seen in Table 1, the median age of the sample of each county surveyed in Texas was much higher than the median age of the population of each county according to the U.S. Census Bureau (2000).

Table 2 compares the county samples with the 2000 Census on gender. Females were highly underrepresented

Table 1. Median Age by County

County	Median Age	
	Sample	Population
Angelina	59.07	34.2
Aransas	64.77	42.7
Brazoria	57.25	34.0
Brewster	60.44	36.2
Colorado	58.48	30.0
El Paso	55.82	30.0
Nacogdoches	58.17	29.7
Panola	54.94	38.8
Pecos	57.15	31.2
Reeves	55.86	32.1
Refugio	60.63	38.6
Trinity	64.78	43.3

in the survey sample of each county as compared to the total county population provided by the U.S Census Bureau (2000).

According to U.S. Census Bureau (2000), the percentage of high school graduates in the counties sampled was higher than the percentage of high school graduates in the total population of each county (Table 3). The same difference is also evident for percentage of college graduates in the sample and the population (Table 4). In sum, the sample is older, more male, and more highly educated than the general population in each county.

Texas is a particularly interesting place to examine

Table 2. Percentage of Females by County

County	Percentage of Females	
	Sample	Population
Angelina	35.1	50.9
Aransas	46.4	50.3
Brazoria	35.9	48.4
Brewster	37.2	50.2
Colorado	29.8	51.2
El Paso	43.2	51.8
Nacogdoches	44.8	51.8
Panola	38.6	52.0
Pecos	44.6	44.8
Reeves	32.3	47.2
Refugio	34.4	51.1
Trinity	46.6	51.7

Table 3. Percentage of High School Graduate Respondents (Age 25 & Older) by County

County	Percentage of High School Graduates	
	Sample	Population
Angelina	89.8	71.2
Aransas	93.5	74.6
Brazoria	96.9	79.5
Brewster	94.8	78.6
Colorado	92.2	69.1
El Paso	92.6	65.8
Nacogdoches	96.4	73.7
Panola	96.5	75.9
Pecos	85.7	62.5
Reeves	86.7	46.6
Refugio	87.1	68.1
Trinity	92.2	73.1

Table 4. Percentage of College Graduate Respondents (Age 25 & Older) by County

County	Percentage of College Graduates	
	Sample	Population
Angelina	45.4	14.7
Aransas	43.0	16.7
Brazoria	49.0	19.6
Brewster	67.0	27.7
Colorado	41.4	14.4
El Paso	47.1	16.6
Nacogdoches	49.5	22.8
Panola	40.0	13.4
Pecos	38.6	12.9
Reeves	26.7	8.0
Refugio	27.1	11.6
Trinity	31.0	9.4

the United States' energy future. The Texas economy was born out of the oil industry. The first global petroleum reservoir was discovered near Beaumont, Texas. As new pockets of oil were discovered, oil booms occurred regularly throughout Texas. Olien and Olien (1982) contend that oil booms were even more competitive than other natural-resource-driven booms because oil is a "flowing mineral" in which two drilling competitors can tap into the same oil formation beneath the ground. The goal was to extract as much oil as possible before anyone else had the chance to tap into the newly discovered supply.

As production increased, the profit return on oil was weakened. Then, John D. Rockefeller realized he could buy out competing small, independent producers and refineries and control the market, creating a monopoly (Gramling 1996; Yeomans 2004). The profit cycle of oil began. When new oil fields are discovered and extracted, the cost of oil goes down (Yeomans 2004). Eventually a decline of oil production throughout the state of Texas began during the 1970s, and attention was turned to the Gulf of Mexico and the Outer Continental Shelf (OCS). Yet the Texas oil industry is currently resurgent, bringing in huge revenues due to the increased demand of oil (McEwen 2008).

Coastal wetlands, hardwood forests, and desert ecosystems were the three regions surveyed. Both the hardwood forests and coastal wetlands are known hard-path adherents for timber, oil, and other nonrenewable natural resources. The desert ecosystem has lacked the abundance of usable natural resources provided by the hardwood forests and coastal wetlands until the creation of wind farms (State Energy Conservation...2008).

Hypotheses

Based on the theories presented in Chapter II, the literature review in Chapter III, and the discussion of the Texas energy above, the following hypotheses concerning

Texans' energy-path preferences were tested:

Age

H₁: Older respondents will be more supportive of a hard-energy path.

Sex

H₂: Male respondents will be more supportive of a hard-energy path.

Political Ideologies

H₃: Respondents associated with the Republican Party and/or conservative ideologies will be more supportive of a hard-energy path.

Income

H₄: Respondents reporting higher annual incomes will be more supportive of a hard-energy path.

Education

H₅: The respondents reporting a lower level of education will be more supportive of a hard-energy path.

Knowledge of Problems

H₆: Respondents reporting more familiarity with the the offshore-drilling/sensitive-lands debate will be more supportive of a hard-energy path.

Environmental Ideologies

H₇: Respondents who perceive the energy crisis as not serious will be more supportive of a hard-energy path.

H₈: Respondents who think that the United States will not face a critical energy shortage in the next five years will be more supportive of a hard-energy path.

H₉: Respondents who subscribe to the dominant social

paradigm will be more supportive of a hard-energy path.

Oil/Gas Employment

H₁₀: Respondents who are employed by the oil and/or gas industry will be more supportive of a hard-energy path.

Community Activeness

H₁₁: Respondents who are less active in the community will be more supportive of a hard-energy path.

H₁₂: Respondents who have lived longer in the community will be more supportive of a hard-energy path.

Non-Pecos County Residents

H₁₃: Respondents who live outside Pecos County will be more supportive of a hard-energy path.

Dependent Variables

The dependent variables were preference for a hard-energy path and preference for soft-energy path to move America off reliance on foreign oil. These dependent variables were composite measures created by scaling fifteen items on the survey. These items were presented in a matrix format on the questionnaire. The lead-in question posed was,

"As you may know, the United States depends on foreign countries for oil. For each one please indicate whether you (1) strongly support, (2) slightly support, (3) are unsure, (4) slightly oppose, or (5) strongly oppose."

The fifteen items in the matrix were:

- Increase the gasoline tax.

- Permit more nuclear power plants to be built.
- Invest in research and development of wind power energy sources.
- Invest in research and development of solar power energy sources.
- Build cleaner burning coal-fired power plants.
- Relax environmental standards for drilling of oil and gas on environmentally sensitive lands.
- Eliminate environmental standards for the drilling of oil and gas on environmentally sensitive lands.
- Impose stricter fuel mileage standards in cars and trucks.
- Invest in research and development of biofuels.
- Encourage smart growth (as opposed to suburban sprawl).
- Permit more oil refineries to be built.
- Increase production of oil and gas in the U.S.
- Raise prices to reduce demand.
- Close gas stations on certain days.
- Impose restrictions on driving.

When principal components factor analysis was performed on these fifteen items, two distinct components emerged: preference for a hard-energy path and preference for a soft-energy path. The preference for the hard-energy path component included the following statements:

- Permit more nuclear power plants to be built.
- Build cleaner burning coal-fired power plants.
- Relax environmental standards for drilling of oil and gas on environmentally sensitive lands.
- Eliminate environmental standards for the drilling of oil and gas on environmentally sensitive lands.
- Permit more oil refineries to be built.
- Increase production of oil and gas in the U.S.

Reliability analysis revealed that the items comprising the hard-energy path had a Cronbach's Alpha score of .768.

The preference for the soft-energy-path component consisted of five items, which had a Cronbach's Alpha score of .697. The soft-energy-path scale includes the following statements:

- Invest in research and development of wind power energy sources.
- Invest in research and development of solar power energy sources.
- Impose stricter fuel mileage standards in cars and trucks.
- Invest in research and development of biofuels.
- Encourage smart growth (as opposed to suburban sprawl).

Four items in the matrix did not load highly on either component and were not included in the hard- or soft-energy scales. The statements eliminated after the factor analysis include:

- Increase the gasoline tax.
- Raise prices to reduce demand.
- Close gas stations on certain days.
- Impose restrictions on driving.

Independent Variables

Age was measured in years, with lower values reflecting younger ages. Sex was coded as 0= male and 1= female. Education was measured in years, and lower values reflected lower levels of education.

Political ideology was measured by asking respondents to rate their political views on a 7-point Likert-type scale, where 1= Very Liberal, 4= Moderate, and 7= Very

Conservative. Political party was also measured. The respondent chose one of the following political parties with which to affiliate:

- Constitution Party
- Democratic Party
- Green Party
- Libertarian Party
- Republican Party
- Other (please specify)

The Republican Party was designated as the reference category, and dummy variables were created for the Democratic Party and Other political party. The Constitution party, Green Party, and Libertarian Party were aggregated into the "Other Party" category due to the small number of respondents that signified being a member of any of those parties.

Income was measured using a single item with the following categories:

- Under \$9,999
- \$10,000 to \$19,999
- \$20,000 to \$29,999
- \$30,000 to \$39,999
- \$40,000 to \$49,999
- \$50,000 to \$59,999
- \$60,000 to \$69,999
- \$70,000 to \$79,999
- \$80,000 to \$89,999
- \$90,000 to \$99,999
- \$100,000 to \$109,999
- \$110,000 to 119,999
- \$120,000 to \$129,999

- \$130,000 or more

Environmental Ideology was determined by three questions. First, the revised NEP scale, consisting of fifteen-item-Likert-scale items measured on a five-point scale, assessed the respondent's view on the relationship between humans and the environment. The fifteen items were as follows:

- We are approaching the limit of the number of people the earth can support.
- Humans have the right to modify the natural environment to suit their needs.
- When humans interfere with nature it often produces disastrous consequences.
- Human ingenuity will insure that we do NOT make the earth unlivable
- Humans are severely abusing the environment.
- The earth has plenty of natural resources if we just learn how to develop them.
- Plants and animals have as much right as humans to exist.
- The balance of nature is strong enough to cope with the impacts of modern industrial nations.
- Despite our special abilities humans are still subject to the laws of nature.
- The so-called "ecological crisis" facing humankind has been greatly exaggerated.
- The earth is like a spaceship with very limited room and resources.
- Humans were meant to rule over the rest of nature.
- The balance of nature is very delicate and easily upset.
- Humans will eventually learn enough about how nature works to be able to control it.
- If things continue on their present course, we will soon experience a major ecological catastrophe.

Second, the respondents rated the seriousness of the energy problems on a scale from 1 to 7: 1= Not At All

serious, while 7= Extremely Serious. During data cleaning the first and second answer categories were combined because individuals answering 1 would have otherwise been outliers (Mertler and Vannatta 2005). Third, respondents reported whether they think the United States will face a critical energy shortage during the next five years, 0= No, 1= Yes.

Knowledge of environmental problems was measured by respondents' self-reported familiarity with the debate surrounding exploration and/or production of oil and natural gas in offshore/sensitive-lands debate in a seven-point scale. The scale ranged from (1) Extremely Familiar to (7) Extremely Unfamiliar.

Oil/Gas employment was measured by respondents choosing whether they are (or were ever) employed in an occupation related to the oil and gas industry (0= No and 1= Yes).

Community Activeness was measured by scaling eight items on the survey. These items were in a matrix question that asked respondents to indicate whether they have engaged in such an action with 0= No and 1= Yes:

- Attended a public meeting to get information and learn more about the drilling and/or production of oil and natural gas on environmentally sensitive lands
- Contacted a local elected official or governmental agency to complain about an oil and natural gas

drilling and/or production issue on environmentally sensitive lands

- Voted FOR a political candidate because of his/her position on the drilling and/or production of oil and natural gas on environmentally sensitive lands
- Voted AGAINST a political candidate because of his/her position on the drilling and/or production of oil and natural gas on environmentally sensitive lands
- Attended an energy industry-sponsored meeting to get information and learn more about the exploration and/or production of oil and natural gas on environmentally sensitive lands
- Attended a public meeting to OPPOSE the exploration and/or production of oil and natural gas on environmentally sensitive lands
- Attended a public meeting to SUPPORT the exploration and/or production of oil and natural gas on environmentally sensitive lands
- Wrote and mailed a letter to the editor of your local newspaper about the exploration and/or production of oil and natural gas on environmentally sensitive lands

Community activeness was also measured using the length of respondents' residence within the community. Length of residence was recorded in years, and lower values resulted in less time lived in the community.

Respondents also selected the county in which they currently lived. My reference category was Pecos County, and dummy variables were created for the remaining counties. County Residence was coded as 0= all other counties and 1= Pecos County.

Control Variables

Economic Preference was measured using fourteen items on the survey. These items were in a matrix question

that instructed:

Please read the following statements and indicate whether you (1) Strongly Agree, (2) Mildly Agree (3) Are Unsure, (4) Mildly Disagree, or (5) Strongly Disagree. Circle one answer for each item.

The items were worded as follows:

- The oil and gas industry is important to the Texas economy.
- Oil and gas industry operators in Texas are too politically powerful.
- Decisions about oil and gas-related development in Texas should be made solely on economic grounds.
- Not enough information concerning oil and gas development in Texas is being made available to the general public.
- Even when carefully controlled, oil and gas development is likely to upset the quality of life in Texas.
- Too little attention is being paid to the social costs of oil and gas development in our State.
- The oil and gas industry has no compassion for our natural environment.
- Because industry has to be competitive, it is unfair to expect oil and gas companies to tell the public about their plans.
- All in all, the benefits of oil and gas development are greater than the costs.
- The oil and gas industry MUST adopt and use more environmentally friendly drilling practices
- Oil and gas companies will do only what's required by law.
- In the long run, I'm sure that people in Texas will be better off if our energy resources are developed.
- Oil and gas operators are drilling and producing too close to homes and businesses.
- People who object to oil and gas development in Texas should move someplace else.

Principal components analysis was completed on these fifteen items and two components emerged. The first

component (labeled TOGECON1 as in Texas Oil and Gas ECONomy is number 1) represented preference in favor of the Texas oil and gas economy compared with the environment and the second component (labeled TOGSENV1 as in Texas Oil and Gas Second and ENVironment is number 1) represented the preference for the environment over the economy. TOGECON1 had a Cronbach's Alpha score of .628 and included the following statements:

- Decisions about oil and gas-related development in Texas should be made solely on economic grounds.
- Because industry has to be competitive, it is unfair to expect oil and gas companies to tell the public about their plans.
- All in all, the benefits of oil and gas development are greater than the costs.
- People who object to oil and gas development in Texas should move someplace else.

The following statements were factored into TOGSENV1 with a Cronbach's Alpha Score of .827:

- Oil and gas industry operators in Texas are too politically powerful.
- Not enough information concerning oil and gas development in Texas is being made available to the general public.
- Even when carefully controlled, oil and gas development is likely to upset the quality of life in Texas.
- Too little attention is being paid to the social costs of oil and gas development in our State.
- The oil and gas industry has no compassion for our natural environment.
- The oil and gas industry MUST adopt and use more environmentally friendly drilling practices
- Oil and gas companies will do only what's required by

law.

- Oil and gas operators are drilling and producing too close to homes and businesses.

The statements, "The oil and gas industry is important to the Texas economy," and "In the long run, I'm sure that people in Texas will be better off if our energy resources are developed" did not load highly on either component and were eliminated.

Respondents also selected whether they thought the environment or the economy should be given higher priority with the following question:

Many environmental issues involve difficult tradeoffs with the economy. Which of the following statements BEST describes your view on the topic? (please circle only one response)

- Higher priority should be given to protecting the environment, even if it might hurt the economy.
- Higher priority should be given to economic considerations, even if it might hurt the environment.
- Both the environment and the economy are equally important; therefore, neither should be given a higher priority.
- I am not sure which one should be given higher priority.

Dummy variables were created for the independent variable falling into the four above mentioned categories. The statement, "Higher priority should be given to protecting the environment, even if it might hurt the economy" was recoded into ENVOECON (ENVironment Over

ECONomy). The statement, "Both the environment and the economy are equally important; therefore, neither should be given a higher priority" was recoded into ENVECONS (ENVironment and ECONomy the Same). The statement, "I am not sure which one should be given higher priority" was recoded into UNSURE. My reference category was the statement, "Higher priority should be given to economic considerations, even if it might hurt the environment" to determine the presence or absence of agreement.

Analysis Plan

To test my hypotheses, the dependent measures, preference for hard-energy path and preference for soft-energy path will be correlated with the independent variables as well as the control variables. Next, the dependent measures will be regressed on the independent variables and the control variables.

CHAPTER V

ANALYSES

My findings are presented in two parts. First, the bivariate relationships were examined to see if my hypotheses are supported. Then these relationships were more rigorously examined through regression analysis, which will examine the relationships controlling for the other variables included in the regression model.

Bivariate Relationships

The first hypothesis stated that older respondents will be more supportive of a hard-energy path. Table 5 presents the list-wise correlations between the dependent variables and the other variables being examined. According to Table 5, my first hypothesis is supported. Age is moderately correlated to preference for the hard-energy path yet has no correlation to the soft-energy path. As age increases, older respondents are more likely to prefer a hard-energy path to end U.S. reliance on foreign oil. The second hypothesis stated that male respondents will be more supportive of a hard-energy path. This hypothesis was also supported. Being female was significantly negatively

Table 5. List-wise Correlations of Dependent and Independent Variables

	Hard-energy Path	Soft-energy Path
Age	.241 ^{***}	.037
Female	-.265 ^{***}	-.009
Political Ideology	.394 ^{***}	-.194 ^{***}
Democratic Party	-.225 ^{***}	.091 ^{**}
Other political Party	-.136 ^{***}	.065 [*]
Years of Formal Education	-.043	.050
Income	.096 ^{***}	-.020
NEP	-.585 ^{***}	.417 ^{***}
Serious Energy Crisis?	-.146 ^{***}	.164 ^{***}
Energy Crisis in next 5 yrs	-.109 ^{***}	.158 ^{***}
Familiarity with oil- drilling issues	-.109 ^{***}	-.023
Employment in gas/oil	.140 ^{***}	.024
Active in community	-.086 ^{**}	.055
Length in community	.104 ^{***}	-.056
TOGSENV1	.508 ^{***}	-.334 ^{***}
TOGECON1	.519 ^{***}	-.268 ^{***}
ENVOECON	-.413 ^{***}	.225 ^{***}
ENVECONS	.165 ^{***}	.008
UNSURE	.047	-.173 ^{***}
Pecos	-.043	.002

* $p < .05$; ** $p < .01$; *** $p < .001$

correlated to preference for the hard-energy path.

Therefore, males are more likely to prefer a hard-energy path to end our reliance on foreign oil. Sex is not an indicator for the soft-energy path.

My third hypothesis stated that respondents

associating with the Republican Party and/or conservative ideologies will be more supportive of a hard-energy path. This hypothesis was also supported by the data. The more conservative respondents identified themselves to be, the more likely the respondents favored the hard-energy path for reducing the reliance on foreign oil. In addition, the more conservative one identified oneself as being; the less one preferred the soft-energy path. In addition, affiliation with the Democratic Party and Other parties had a significant, negative correlation to the hard-energy path and a significant, positive correlation to the soft-energy path.

My fourth hypothesis stated that respondents reporting higher annual incomes will prefer a hard-energy path. Again we see some support of this hypothesis. Data in Table 5 show a weak correlation between income and a preference for the hard-energy path and no significant relationship between income level and the preference for soft-energy path.

The fifth hypothesis stated that respondents reporting a lower level of education will positively correlate with a hard-energy path. This hypothesis was not supported in the bivariate analysis. Years of formal education has no correlation to the soft- or hard-energy path.

The sixth hypothesis stated that respondents reporting more familiarity with the offshore drilling/sensitive-lands debate will be more supportive of a hard-energy path. This hypothesis was not supported. Preference for the hard-energy path had a small, significant, negative correlation to familiarity with the offshore drilling/sensitive-lands debate, while the preference for the soft-energy path had no correlation to familiarity with the offshore drilling/sensitive-lands debate. Respondents who report more knowledge of the offshore drilling/sensitive-lands debate demonstrate less support for a hard-energy path as a way of ending the U.S. reliance on foreign oil.

The seventh hypothesis stated that respondents who perceive the energy crisis as not serious will be more supportive of a hard-energy path. This hypothesis was supported with a moderate, negative correlation, with a Pearson correlation of $-.146$ as shown in Table 5. The more serious respondents found the energy situation in the United States today, the less likely they were to prefer a hard-energy path and the more likely they were to prefer a soft-energy path.

The eighth hypothesis stated that respondents who think that the United States will not face a critical energy shortage in the next five years will be more

supportive of a hard-energy path. Again, the results are the same as for hypothesis seven above. Respondents who believed there will be an energy crisis in the next five years are less likely to prefer a hard-energy path and more likely to prefer a soft-energy path.

The ninth hypothesis stated that respondents who subscribe to the dominant social paradigm will be more supportive of a hard-energy path. This hypothesis was tested by using the revised NEP scale. The NEP is by far the most highly correlated indicator of energy-path preference. The more environmental a respondent's attitudes, the less likely one is to prefer a hard-energy path (-.585) and the more likely one is to prefer a soft-energy path (.417). This hypothesis was supported.

The tenth hypothesis stated that respondents who are employed by the oil and/or gas industry will be more supportive of a hard-energy path. This hypothesis was supported. Employment in the oil and/or gas industry had a significant, positive correlation to a hard-energy path and no correlation to the soft-energy path.

The eleventh hypothesis stated that respondents who are less active in the community will be more supportive of a hard-energy path. This hypothesis was not supported. Community activeness has a small, negative correlation to

the hard-energy path and no correlation to the soft-energy path as shown in Table 5. The more active a respondent is within the community, the less he or she will prefer the hard-energy path.

The twelfth hypothesis stated that respondents who have lived longer in the community will be more supportive of a hard-energy path. This hypothesis was supported. The longer one has lived in his or her community the more likely one prefers a hard-energy path for ending the reliance on foreign oil. Length of residence had no correlation with the soft-energy path.

The last hypothesis stated that respondents living outside Pecos County would be more supportive of a hard-energy path. Residents in Pecos County, which is the only county of the twelve surveyed to have a significant soft-energy presence (a large-scale wind energy production facility [State Energy Conservation Office 2008]), had no relationship to the soft- or hard-energy path for ending the reliance on foreign oil at the bivariate level.

Multivariate Analysis

To test my hypotheses more rigorously, I regressed preference for the hard- and soft-energy paths on my independent variables as well as my control variables. Looking at Table 6, the R^2 for the hard-energy path was

Table 6. Betas and Coefficients of Determination for Hard- and Soft-energy Paths Regressed on Independent and Control Variables (n= 812)

	Hard-energy Path	Soft-energy Path
Age	.157 ^{***}	.099 ^{**}
Female	-.129 ^{**}	-.041
Political Ideology	.065 [*]	-.006
Democratic Party	-.041	.016
Other political Party	-.033	.014
Years of Formal Education	-.039	.021
Income	-.008	.005
NEP	-.233 ^{***}	.258 ^{***}
Serious Energy Crisis?	.009	.039
Energy Crisis in next 5 yrs	.017	.029
Familiarity with oil drilling issues	-.032	-.024
Employment in gas/oil	.002	.042
Active in community	-.027	.032
Length in community	.016	-.045
TOGSENV1	.183 ^{***}	-.172 ^{***}
TOGECON1	.264 ^{***}	-.098 ^{**}
ENVOECON	-.168 ^{***}	.021
ENVECONS	-.058	.003
UNSURE	-.031	-.115 ^{**}
Pecos	-.020	.072 ^{**}
R ²	.545	.250
F	46.677 ^{***}	13.165 ^{***}

* $p < .05$; ** $p < .01$; *** $p < .001$

.545. Thus, the variables in the model explain 54 percent of the variance in preference for the hard-energy path. The R² for the soft-energy path was .250. The variables in the model explain 25 percent of the variance in preference for

the soft-energy path. Multicollinearity was also tested, and there were no problems affecting the reliability of the coefficients.

Table 6 presents the betas and coefficients of determination for preference for the hard-energy path and soft-energy path regressed on the independent and control variables. At the multivariate level, relationships changed when all of the variables were entered simultaneously.

The first hypothesis, concerning age and hard-energy-path preference, is still supported for the hard-energy path when controlling for the other variables. In addition, a suppressed relationship emerged concerning age and the soft-energy path in which age became a significant, positive indicator. So, it appears that older individuals prefer both the hard- and soft-energy paths to get the United States off foreign oil. Perhaps older individuals are more concerned about reliance on foreign oil than younger individuals and are willing to try any approach to end reliance.

The bivariate relationships found between sex and hard- and soft-path preferences do not change when controlling for the other variables. Females had a moderate, negative relationship to the hard-energy path for reducing our reliance on foreign oil and no relationship to

the soft-energy path. Thus, support for the second hypothesis still remains.

Support for my third hypothesis concerning political ideology and preference for the hard- and soft-energy paths lessened considerably once I controlled for the other variables are controlled for. In the multivariate model conservatives had a slight preference for the hard-energy path for reducing the reliance on foreign oil. However, political ideology was no longer related to support for the soft-energy path when controlling all of the other variables. In addition, political party affiliation was no longer a predictor for either the hard or soft-energy path. There was no significant difference among Democrats, Republicans, and Other parties on their preferences.

No support was found for either hypothesis four or five in the multivariate analysis. While income had a significant relationship with preference for the hard-energy path in the bivariate case, that relationship disappeared when I controlled for other variables. Years of formal education were not significant in either the bivariate or multivariate cases.

In addition, hypotheses six, seven, and eight were no longer supported in the multivariate case. A significant correlation between familiarity and preference for the

hard-energy path had been found in Table 5, but the relationship failed to maintain significance once other variables were controlled. In addition, perceptions of the energy crises as not serious and beliefs concerning an impending energy crisis in the United States had been significantly correlated to both hard- and soft-energy path preferences yet became insignificant predictors of energy-path preference for reducing the U.S. reliance on foreign oil once controls were included.

Support continued to be found for hypothesis nine. The New Environmental Paradigm scale was again a strong, significant indicator for energy-path preference. The more environmental one scored, the less likely one was to prefer a hard-energy path for reducing the U.S. reliance on foreign oil (-.233) and the more likely to prefer the soft-energy path (.260). Looking at the Betas, the NEP scale was the best predictor of soft-path preference.

Hypotheses ten, eleven, and twelve had been supported in the bivariate case, but the regression analysis withdrew that support. Controlling for the other variables in the model makes oil and gas employment and community activeness insignificant as predictors of energy-path preference.

While no support for Pecos respondents as holding different preferences was found in the bivariate analysis,

a suppressed relationship was revealed in the regression. Respondents from Pecos County, where a significant soft-path-generation facility exists, are more likely to support the soft-energy path, controlling for other variables in the model.

Several of the control variables were significant predictors of the hard- and soft-energy paths as well. The more respondents favored the Texas oil and gas industry over the environment (TOGECON1), the higher their preference for the hard-energy path and the lower their preference for the soft-energy path for reducing the U.S. reliance on foreign oil. Preference for the oil and gas industry over the environment was the most powerful indicator of preference for the hard-energy path (.264).

It is interesting that the more respondents favored the environment over the Texas oil and gas industry (TOGSENV1) the higher their relationship to the hard-energy path and the less likely their preference for the soft-energy path. Whether or not respondents favored the environment or the oil and gas industry, those respondents were likely to prefer the hard-energy path and not prefer the soft-energy path for reducing the U.S. reliance on foreign oil.

The other set of control variables compared attitudes

toward environmental issues and difficult tradeoffs with the economy. The reference category was, "Higher priority should be given to economic considerations, even if it might hurt the environment." Believing that, "higher priority should be given to protecting the environment, even if it might hurt the economy" (ENVOECON) had a significant, negative relationship to the hard-energy path and had no relationship to the soft-energy path. This preference means that folks who responded with this answer favored the hard-energy path significantly less frequently than did those who thought that higher priorities should be given to the economy even if the environment takes the hit.

Respondents who felt the economy and the environment were equally important were not significantly different from the reference category. Finally, respondents who answered that they were unsure of whether the economy or the environment should be given higher priority were less likely to prefer the soft-energy path than were people who answered that the economy should be a higher priority than the environment.

CHAPTER VI

CONCLUSIONS

Because age is a significant, positive indicator for both the hard- and soft-energy path, I can only conclude that older respondents want to reduce the U.S. reliance on foreign oil by any means necessary. Age indicates that the older a respondent is, the more likely he or she is going to perceive any reliance on foreign oil as risky for the future. The multivariate analysis explains that, while the hard-energy path is considered slightly less risky to end the reliance on foreign oil, older respondents find a soft-energy path less risky than staying on the current path of a heavy reliance on foreign oil.

As the literature review discussed, age is often the strongest demographic indicator (Carmen 1998; Cottrell 2003; Dunlap and Mertig 1997; Jones and Dunlap 1992; Tognacci, Weigel, Wideen, and Vernon 1972; Van Liere and Dunlap 1980). Age was also the most significant demographic indicator when evaluating risk perception and energy-path choices, which is consistent with Greenberg's (2004) findings that stated that support among the older

population is growing while diminishing among the younger age groups. Because I concluded that older respondents perceive any reliance on foreign oil to be risky, I must reject Inglehart's (1987) theory of postmaterialism because of the vital importance of the oil and gas industry on the economy of Texas, and thus, the basic needs of life for many individuals residing in Texas is still a concern.

Response by sex is consistent with the previous literature because women are more likely than men to be concerned with pollution effects (Smith 2001a) of hard-energy technology and engage in more personal environmental actions. Females are more likely to be in charge of recycling (McStay and Dunlap 1983; Smith 2001a), which supports soft-energy technology. I believe that if females had been represented equally in the survey sample, a significant relationship would have emerged with the soft-energy path at the multivariate level.

My findings for political ideology are consistent with the previous literature that found Liberals are routinely more pro-environmental than are Conservatives (Carmen 1998; Constantini and Hanf 1972; Dunlap 1975; Dunlap and Gale 1974; Greenberg 2004; Jones and Dunlap 1992; Mitchell 1978; Tognacci et al. 1972; Van Liere and Dunlap 1980). The significance was slight, but still consistent with previous

findings.

Contradictory findings concerning preference for the environment (TOGSENV1) or the oil and gas industry (TOGECON1) are demonstrated in Table 6. Respondents who favored the environment over the oil and gas industry had a surprising, negative relationship to the soft-energy path. The statements that determined the preference of the environment were all concerning the oil and gas industry. I can only conclude that respondents who normally had more pro-environmental attitudes had a negative relationship to the soft path with this measure because they were answering questions about hard-energy technology, about which they would normally have negative opinions despite how those questions might be presented.

Knowledge theory is supported by Pecos County having a moderate, positive relationship with the soft-energy path. As stated earlier, Pecos County is the only county surveyed with these data that has large-scale soft energy production of wind farms (State Energy Conservation...2008). This moderate, positive relationship of finding a soft-energy path less risky to reducing the U.S. reliance on foreign oil can be explained because residents of Pecos County are becoming knowledgeable of an alternative, sustainable way to obtain energy. I have to disagree with Wildavsky and

Dake's (1990) assumption that knowledge theory has a minimal relationship to risk perception as it has a moderate significance to the soft-energy path in my model. On the other hand, Wildavsky and Dake (1990) identify a direct correlation between knowledge of technology and risk perception, with which I completely agree. Individuals, especially Texans, are going to find the traditional technology they know and understand to be the least risky method for reducing our nation's dependence on foreign oil.

In Pecos County, Texas individuals have the opportunity to witness hard and soft technology meeting energy demands. The addition of soft-energy technology is also creating a new source of revenue for the county, creating jobs, and familiarizing Pecos county residents with alternative, sustainable technology. Because we know that Texas has reached peak oil production, residents of Pecos County are experiencing the soft-energy path as Lovins (1978) predicted it would emerge, as slowly replacing the hard-energy path.

Knowledge theory can also be supported by the significance of respondents who were unsure whether the environment or the economy should have priority. If people who rated their self-knowledge of technologies to be higher perceive greater benefits, as Wildavsky and Dake (1990)

concluded, people with little knowledge of alternative, soft-energy technology would have a negative, moderate relationship to the soft-energy path. Those individuals are going to perceive the soft-energy path as more risky because they have no technical knowledge of alternative energy sources and they have not experienced the economic benefits of such technology.

Wind farms are just another source of Income for Pecos County, and, therefore, the soft-energy path is being presented as a gain rather than a loss to the residents of this county as stated by Gattig and Hendricks (2007) in their interpretation of economic theory. Regardless, I had no measures other than level-of-income to test for economic theory, and income was not significant for this model.

Because the NEP was the strongest predictor for the soft-energy path preference and the second largest predictor for preference of the hard-energy path, I must conclude that the NEP is the strongest overall measure of comparing risk perception and reducing the U.S. reliance on the foreign oil. Combined with the significance of the favoring the environment over the economy, the NEP demonstrates that environmental attitude and ideology are the most significant measures for predicting risk perceptions and energy-path preference.

Data Limitations

Limitations for this study include having a sample not representative of the total population. The sample was much older and wealthier than the population. Females were underrepresented, by as much as 21 percent in one county, compared with the total population of Texas.

The survey lacked questions on religious attitude or affiliation. Religion could have been another significant measure of the relationship between risk perceptions and energy-path preference. There was also no information on children of the respondents surveyed. The significance of children might have been influential in explaining risk perception and energy-path preference.

Research Implications

The results of this research make it clear that individuals are very ideologically receptive to sustainable forms of energy. However, first-hand knowledge of the soft-energy technology is the key to moving toward the soft-energy path. My research suggests that individuals fear only the economic risks of the soft-energy path because they are not aware of the economic benefits and/or ease of implementation of such technology. This finding would mean that organizations promoting soft-energy technologies should focus on demonstrating projects that allow community

members to become familiar with soft-energy technology. The preference of energy path could be described in a community newsletter to begin discussions about a new method for obtaining energy by specifically addressing the path-preference change occurring in Pecos County. In addition, field trips to nearby facilities could be scheduled by groups interested in promoting green technologies. T. Boone Pickens has developed a plan to produce as much as 22 percent of the U.S. energy demand with large-scale wind farms throughout Texas and Oklahoma (Pickens 2009). A newsletter about soft energy and the social conditions of residents in Pecos County as well as field trips to the county could be the first steps in gaining the trust and interest of communities T. Boone Pickens hopes to recruit to accommodate large-scale wind farms.

Future Research

To study risk perceptions and energy solutions in the future, survey questions should be developed to incorporate Douglas and Wildavsky's (1982) culture theory as it has previously accounted for three percent of the total variance in explaining risk perception. While this variable is some percentage of the variation, it appears that environmental risk perceptions are affected by many

variables.

It would also be very interesting to administer the same data survey in a state such as California, where most of the revenue is based on the preservation of the environment, to determine whether the results would be the exact opposite. I imagine the results would demonstrate that the risk becomes environmental degradation. I believe the results would be drastically different in a geographic area where natural beauty is the economy and the oil and gas industry are considered a direct threat to the economy.

Due to the significance of Pecos County in the multivariate analysis, I think this survey should be administered a second time in Texas. The survey should include an equal representation of counties with large-scale hard-energy technology and counties with large-scale soft-energy technology to determine whether the findings discovered in Pecos County represent an isolated incident. I believe the results would reflect that residents of counties with large-scale soft-energy production in Texas are becoming more supportive of the soft-energy path.

Because the results of the data analysis of Texans' risk perceptions clearly demonstrated that environmental attitudes, and in the end, knowledge of energy solutions are the most powerful predictors of risk perception, these

variables should be the focal point of any future research.

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