Energy Policy 73 (2014) 344–355

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

Public opinion about biofuels: The interplay between party identification and risk/benefit perception

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HIGHLIGHTS

- We examined public opinion about biofuels policies.
- Effect of risk/benefit perception varied across respondents' party identification.
- Democrats favored more research when considering economic risks or social benefits.
- Democrats favored biofuels more when considering social benefits.
- Democrats favored biofuels less when considering political risks.

ARTICLE INFO

Article history:
Received 15 December 2013
Received in revised form
5 May 2014
Accepted 7 May 2014
Available online 18 June 2014

Keywords:
Biofuels
Public opinion
Partisanship
Risk/benefit perception
Interactive effect

ABSTRACT

Using an experiment embedded within a representative survey, this study examined the interactive effect of party identification and risk/benefit perception on public opinion about biofuels. Democrats tended to be more supportive of biofuels than Republicans. However, the effect of party identification on opinion about biofuels varied when individuals considered the risk/benefit of biofuels in different domains. Individuals who reported greater affiliation with the Democratic Party were likely to support funding biofuels research when primed with the economic risks or the social/ethical benefits of biofuels. For those who considered the social/ethical benefits of biofuels, more self-identified Democrats were likely to support biofuels production and use. However, more self-identified Democrats were less supportive of biofuels production and use when they considered the political risks of biofuels. Implications are discussed.

1. Introduction

In midst of energy independence and environmental concerns, the U.S. government and industry invested heavily in biofuels during recent years to foster its development as a viable renewable energy source. For instance, the U.S. government spent 22 billion dollars to subsidize biofuels production and consumption from 2009 to 2011 (Energytribune, 2012). As a result, U.S. production of ethanol and biodiesel increased more than 40% between 2008 and 2011 and has become the most common source of renewable energy in the U.S. transportation (The White House, 2011). Although some federal biofuels programs and subsidies have recently been allowed to expire, scientific research is ongoing to improve biofuels technology. Specifically, scientists are developing second-generation biofuels for sustainable growth in production and consumption. Biofuels remain the most promising potential substitute for petroleum. However, opinion polls about biofuels as an alternative energy source are mixed. Some studies (Bolsen and Cook, 2008; Rabe and Borick, 2008) indicated a favorable view, and others showed growing concerns and doubts (Belden, Russonello & Stewart, 2010). These mixed opinions signify biofuels as a controversial science issue. Furthermore, the international debate surrounding recent large-scale corn imports from Brazil and Argentina to the United States for ensuring grain supply may potentially influence the public's opinion about biofuels (Index Mundi, 2014; PIERS, 2014; Reuters, 2012).

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http://dx.doi.org/10.1016/j.enpol.2014.05.016
0301-4215/

When facing complex and uncertain science and technology issues, people tend to use judgmental heuristics to form opinions (Scheufele, 2006). Party identification (e.g., Kim, 2011) and technology-specific risk and benefit perceptions (e.g., Siegrist, 2000), for instance, are common decision cues for making judgments about science and technology issues. Literature in science communication has examined how these two heuristics independently contribute to opinion formation; however, little attention has been paid to the interplay of these two different heuristics to influence public attitudes toward science and technology. Self-identification with a political party is part of an individual's self-concept and has a referent influence on opinion formation (Smith and Hogg, 2008). Furthermore, perceived risks and benefits influence opinion about whether a technology is acceptable and safe (Siegrist and Cvetkovich, 2000). Specific to the case of biofuels, a bipartisan divide exists in support of biofuels and its policies, and this gap is widening (Pew Research Center, 2011). Studies suggest biofuels are associated with advantages and disadvantages (Petrous and Pappis, 2009). As such, party identification and risks and benefits considerations may work in tandem to influence public opinion about biofuels. The general public plays a determinant role in the development of a technology (Gupta et al., 2012). A technology's success depends on its acceptance by the public, and public attitudes related to biofuels can influence government policy decisions. Therefore, understanding how the interplay between partisanship and risk/benefit perception of biofuels can provide critical insights into potential sources of influence on public opinion and the process of democratic decision making about public policies related to science and technology.

This study provides a systematic attempt to examine how party identification and risk/benefit perception may jointly influence public opinion toward biofuels. Specifically, we conducted a representative survey in a Midwestern state where biofuels are of political, economic, and social interests. Further, we designed an experiment embedded in a survey to activate risks/benefits considerations of biofuels to test the interaction between party identification and risk/benefit perception.

2. Literature review

2.1. Public opinion about biofuels

Despite the considerable increase in the production and use of biofuels in the past several years and the large amount of public and private funds at stake, research on public opinion about biofuels is rare. Polling results showed general public support for biofuels (Bolsen and Cook, 2008; Rabe and Borick, 2008; Pew Research Center, 2008; Wegener and Kelly, 2008). A focus group study in a bioenergy producing state revealed that respondents had a fair amount of knowledge about biofuels, but were less informed about its policies (Delshad et al., 2010). Supporters perceived biofuels as economically affordable and environmentally friendly (Delshad et al., 2010; Kubik, 2006). Opponents, by contrast, deemed ethanol as harmful to the environment, unsafe, and expensive (Kubik, 2006); and opponents did not support fixed subsidies or cap-and-trade policies (Delshad et al., 2010). These studies suggest that perceptions about the advantages and disadvantages of biofuels are important determinants of attitudes.

Prior studies have also found that prior experience with using biofuels influences attitudes. For instance, according to a National Biodiesel Board commissioned study (ASG Renaissance, 2004), half of the interviewed truck fleet operators have used biodiesel in their vehicles, and all of them indicated that their biodiesel experience has been favorable. New vehicles with the biodiesel-ready fuel tank, taking a leadership role in protecting the environment within the transportation industry, and regulatory restrictions on trucks using cleaner fuels for facility access (e.g., airports) were noted as reasons for using biodiesels. However, about 10% had a negative impression toward biodiesels and also expressed that they did not want further information about biodiesels. Vehicle manufacturers' unclear engine warranty coverage for the use of biodiesels and the lack of refueling facilities that offer biodiesels were mentioned, by those who did not use biodiesels, as the main disadvantage. Another recent study (Johnson et al., 2013) found an association between biodiesel use and perception of biodiesel quality and performance. Specifically, non-biodiesel users were more likely to agree that diesel engines would not run properly on biodiesels. However, biodiesel users were more likely to agree that biodiesels were high quality fuels.

Another study (Cacciatore et al., 2012) found that, in general, the public reacted more positively to the term “biofuels” than to “ethanol.” An interesting observation was that such preference for the term “biofuels” over “ethanol” was particularly large for Democrats. Although an increasing number of studies have examined public opinion toward biofuels and its policies, little is known about how party identification and risk/benefit perception shape attitudes simultaneously.

2.2. Party identification and opinions about biofuels

Party identification is broadly defined as an individual attachment to a political party based on a sense of closeness (Green et al., 2002). As such, individual identification with a political party varies in the degree of intensity ranging from simply a psychological tie to an active engagement in party-sponsored activities. Once the party tie is developed, this partisan orientation is relatively stable and often persists over an individual's lifetime (Green et al., 2002).

Partisanship may influence individual's opinions about science and technology issues because opinion formation is grounded in social identities (Smith and Hogg, 2008). According to social identity theory (Tajfel and Turner, 1986), part of individuals' self-concept comes from knowledge about their perceived membership in groups (i.e., social identities). A social identity is cognitively represented, in one's mind, in the form of a category prototype (Smith and Hogg, 2008). The category prototype is a cluster of organized attributes that specify and govern a group member's feelings, behaviors, and attitudes (Hogg and Reid, 2006). When individuals categorize themselves as members of a group, they internalize the prototypical attributes of the group, including attitude endorsement, and behave consistently with the group prototype (Hogg and Turner, 1987). Such group categorization and identification processes influence individuals to conform to the group prototype, because the prototype functions as a referent guide to formulate their attitudes and behaviors as group members (Lewis-Beck et al., 2008). That is, driven by their social identity and the motivation of being part of the group, individuals tend to align their attitudes with their allegiant group.

In an American political context, voters tend to form a psychological connection either to the Democratic or Republican parties as social groups. The Republican Party's platform is, by and large, grounded on conservative principles that involve free market policies, tradition and order, the rule of law, and a belief in God (Regnery, 2012). In contrast, the Democratic Party's platform is generally based on modern liberalism, which involves the convictions of separation of church and state, social equality, and civil rights (McGowan, 2007). As driven by different political philosophies, the Republican Party is marked by, for instance, its advocates of small government, low taxes, limited regulation, school prayer, capital punishment, and its opposition to abortion and the legalization of same-sex marriage. The Democratic Party is