



Public support for carrot, stick, and no-government water quality policies



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ABSTRACT

Public support for environmental policy provides an important foundation for democratic governance. Numerous policy innovations may improve nonpoint source pollution, but little research has examined which types of individuals are likely to support various runoff reduction policies. We conducted a household mail survey of 1136 residents in southern Wisconsin. In general, residents were more likely to support water quality policies if they were communitarians, egalitarians, concerned about water pollution, and perceived water quality as poor. The majority of respondents somewhat to strongly supported all of the seven proposed water quality policies, but opposed relying on voluntary action without government involvement on farms. Residents had higher support for incentives and market-based approaches (carrot policies) than regulation and taxes (stick policies). A more complicated pattern emerged in within-subject comparisons of residents' views of carrot and stick approaches. Stick approaches polarized respondents by decreasing support among people with individualistic worldviews, while slightly increasing support among people with communitarian worldviews. Residents with an agricultural occupation were more likely to support voluntary, non-governmental approaches for reducing agricultural runoff, and were also more likely to support regulation for reducing urban lawn runoff. This research highlights the dominant role of cultural worldviews and the secondary roles of water pollution concern, perceived water quality, and self-interest in explaining support for diverse policies to reduce nonpoint source pollution.

1. Introduction

Public support provides an important foundation for environmental policy development and implementation within democracies (Dunlap, 1995). Public opinion can influence public policy, particularly on highly salient issues (Burstein, 2003). One important policy decision is the choice of policy instruments to improve environmental conditions (Rosenbaum, 2014). Governments face important choices between “carrot,” or pull incentives such as grants, payments, or tax credits and “stick,” or push penalties such as requirements, taxes, or fines (Bemelmans-Videc et al., 1998), among other options for reducing nonpoint source pollution. Governments may alternatively undertake regulatory reform that emphasizes individual action without government involvement. Nonpoint source pollution, particularly of phosphorus and nitrogen, is a persistent environmental problem that causes eutrophication in lakes, streams, and coastal waters around the world (Carpenter, 2008). Globally, agriculture is the leading nonpoint source of phosphorus runoff polluting lakes and rivers, now that substantial efforts have reduced point source pollution from industrial and

municipal facilities (Diaz, 2001). While “pay the polluter” carrot policies are the more common and accepted approach for reducing runoff from farms and urban lawns, they are expensive and have “not succeeded in improving water quality in many impaired watersheds” (Shortle et al., 2012). Governments are therefore selectively using and exploring “polluter pays” stick instruments, although they may be less politically feasible (Shortle et al., 2012). In this survey-based study, we examine how policy and individual watershed resident characteristics interact to predict public support for agricultural and urban lawn carrot and stick policies to protect water resources.

Public support for environmental policies depends in part on the nature of the policy proposed. Surveys suggest people tend to prefer carrot policies that reward or encourage behavior change to stick policies that require behavior change and sanction or penalize polluters (e.g., Steg et al., 2006; Stoutenborough et al., 2014). Public opinion can narrow or widen the set of plausible policy alternatives available to politicians, influencing whether state and federal representatives advance policies to protect environmental resources (List and Sturm, 2006). In addition to political support for elected leaders, voters can

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directly approve initiatives and referenda for policies and expenditures that benefit the environment (Kirchgässner and Schneider, 2003). Understanding the influence of policy characteristics on public support is key to identifying the conditions under which policy initiatives are likely to succeed in the public arena.

Support for environmental policies also depends on cultural value orientations. Cultural worldviews shape individual interpretations of environmental problems and expected outcomes of environmental policies. Depending on a person's cultural value orientation, they may selectively credit or dismiss evidence that human activities create an environmental risk (Leiserowitz, 2006), or they may interpret policy solutions as exacting a greater toll on societal well-being than the activity targeted for regulation (Kahan and Braman, 2006; Kahan et al., 2007). Some may, for example, view an environmental policy as posing unacceptable threats to economic development or individual autonomy.

We examine how support for different water quality policies for agriculture and urban lawns relate to individuals' cultural worldviews, along with other individual-level variables such as perceptions of lake water quality, concerns about pollution runoff, urban or rural residency, and self-interest measures including occupational relationships to agriculture, and owning or maintaining a lawn. We examine these relationships based on a household survey in southern Wisconsin, USA, asking:

What individual factors explain policy support for nonpoint source water quality policies for lawns and agriculture, including regulation, taxation, tax and utility credits, certification, off-site technology, and voluntary nongovernmental policies? Second, we rely on within-subject comparisons to examine how relative support for carrot or stick policies might turn on the values embedded in cultural worldviews, along with residents' pollution concern, self-interest, and urban or rural residency.

2. Literature review and hypotheses

2.1. Policy type

While clean and healthy environments are a widely shared value, public support for environmental quality improvement can differ for specific policy options. "Surprisingly few" studies have compared public support among specific policy alternatives and examined whether individual predictors vary across alternatives (Stoutenborough et al., 2014). When asked to evaluate environmental measures associated with energy consumption, climate change, transportation, forest management and phosphorus runoff, for example, respondents tend to favor measures that reward environmentally friendly behaviors and resist measures that tax or punish environmentally unfriendly behavior (McCann and Easter, 1999; O'Connor et al., 1999; Poortinga et al., 2003; Rienstra et al., 1999; Schaaf and Broussard, 2006; Steg et al., 2006).

For instance, a U.S. survey of public support for forest policy on private lands revealed stronger support for empowerment tools (e.g., learning and symbolic images) than authority tools (e.g., regulation and sanctions) (Schaaf and Broussard, 2006). Minnesota farmers asked to evaluate measures to reduce phosphorus runoff strongly preferred the use of educational and land stewardship recognition programs compared with taxes on fertilizer and manure (McCann and Easter, 1999). And Netherlands consumers asked to evaluate pricing policies to reduce CO₂ emissions preferred reduced prices for lower-emissions products over increased prices on higher-emissions products (Steg et al., 2006). In line with previous research, we expect:

Hypothesis 1. Respondents will report greater support for carrot (incentive, technological and market-based) policies compared with stick (tax and regulatory) policies.

2.2. Cultural worldviews

Cultural values can predispose groups of individuals to select, ignore and interpret risk information differently, and reach different policy conclusions (Kahan and Braman, 2006; Kahan et al., 2007; Leiserowitz, 2006). We examine the efficacy of cultural theory to explain how values and beliefs influence support for policy instruments addressing pollution. The theory argues that we generate risk perceptions that reinforce our values and beliefs about how society should be structured (Douglas and Wildavsky, 1982). Cultural theorists assert that these worldviews influence more specific policy preferences (Jenkins-Smith et al., 2014; Kahan and Braman, 2006; Wildavsky, 1987).

Attempts to measure worldviews have resulted in a number of distinct measurement strategies modified over time (Ripberger et al., 2014). We adopt the cultural cognition approach developed by Kahan et al. (2007). Cultural cognition frames worldviews along two continuous and cross-cutting attitudinal dimensions about how society should be organized: a communitarian-individualist scale and an egalitarian-hierarchist scale. The communitarian-individualist scale measures concern for collective versus individual interests. The egalitarian-hierarchist scale measures attitudes toward how groups are stratified and deviance from social norms (Kahan et al., 2007).

Along the communitarian-individualist scale, people with a strongly communitarian worldview favor social orderings in which collective needs take precedence over individual interests. In contrast, people with a strongly individualistic worldview fear restrictions on autonomy, such as government regulation. They generally expect people to fend for themselves and dislike having constraints imposed upon them by others. Along the egalitarian-hierarchist scale, people subscribing to a hierarchist worldview are characterized as believing that rights, duties, and resources should be distributed on the basis of clearly defined and stable social characteristics. Those with egalitarian worldviews believe such things should be distributed equally.

Studies suggest perceptions of environmental risks conform to patterns predicted by cultural theory (Kahan et al., 2007; Marris et al., 1998; Steg and Sievers, 2000). People predisposed to communitarian and egalitarian worldviews tend to be more sensitive to environmental threats such as climate change, nuclear waste disposal and general environmental pollution than individuals who are more hierarchist and individualistic (Kahan et al., 2007; Marris et al., 1998). Egalitarian worldviews, for example, have been linked with support for policies using higher taxes to curb energy use and address climate change (Carlisle and Smith, 2005; Leiserowitz, 2006). Furthermore, egalitarian worldviews have been linked with greater concern for potential harms impacting future generations and environmental threats, while more hierarchist worldviews tend to correlate more with social threats such as mugging or terrorism (Marris et al., 1998).

Hypothesis 2. Stronger communitarian and egalitarian worldviews will be associated with stronger support for runoff control policies, and stronger support for stick relative to carrot policies, compared to residents with individualist and hierarchist worldviews.

2.3. Runoff concern and perceived water quality

Policy researchers have long considered problem severity as an important driver of governance innovation and regulatory intervention (Gray, 1973; Sapat, 2004). Representatives and public administrators often act in response to real or perceived problems. Individuals are also more likely to make environmentally-friendly decisions when they believe conditions are deteriorating and represent serious problems (Laroche et al., 2001). Thus, we expect perceptions about lake water quality and impacts of runoff to play a role in policy support. Lubell (2003) suggests that in the context of governing common pool resources such as water, stakeholders may support a policy when they think it addresses an important problem. Among people who perceive a

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