

# Changing Homeowner's Lawn Care Behavior to Reduce Nutrient Losses in New England's Urbanizing Watersheds: The Role of Social Science

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# Outline

- The Issue
  - The Insidious American Lawn and NPS Pollution
- Using Social Science to Address Environmental Issues
- Methodology
  - Theoretical Framework
  - Methodological Triangulation
- Important Findings for Developing Effective Outreach and Education
- Conclusion

# Turf and the American Landscape

- There are an estimated 25-40 million acres of turf in the US (at least twice the acreage of cotton)
- The amount of turf in the US is growing
- Americans spend an estimated \$40 billion on lawn care annually (more than the GDP of Vietnam) (2006)
- Lawn care issues have significant environmental impacts
  - Residential runoff is a significant source of nitrogen and phosphorous (non-point source pollution)
  - Negatively impacts water quality

# Social Science and Environmental Issues

*Simply providing information rarely results in behavior change – Why?*

- Addressing environmental issues is interdisciplinary
- Social sciences are often missing from discussions of environmental issues, but identify
  - Research methods
  - Theories (Theory of Planned Behavior)
  - Application and feedback loops (evaluation)
- ...for stimulating environmentally responsible behavior
- Building ground up by learning from “the audience” is essential
  - *When top down is not feasible*

# An Interdisciplinary Approach: Roles of the project team

*Changing Homeowner's Lawn Care Behavior to Reduce Nutrient Runoff in New England's Urbanizing Watersheds*

- Multi-state/University project team
- Environmental research
- Social science research
- Implemented through Extension
- Provides a framework for future projects

# The Role of Social Science: Project Goals

- Conduct descriptive research on lawn care practices
- Explore primary drivers of do-it-yourselfers' (DIYs) lawn care choices and practices, especially with regard to fertilizer application
- Investigate perceived barriers and benefits to adoption of more water quality-friendly nutrient application practices
- Examine relative measures of trust and frequency of use for various sources of lawn care information
- Evaluation phase

# Applying Specific Theory to the Problem: The Theory of Planned Behavior (TPB)

- A specific theory is needed to best analyze the phenomena and structure our inquiry
- Augmented version of the *Theory of Planned Behavior* applied
  - Theoretical roots in *Theory of Reasoned Action* (Ajzen & Fishbein 1975)
  - Meta-analysis of research applying TPB to environmentally responsible behavior indicates strong empirical support for the theory (Trumbo & O’Keefe 2005; Sutton 1998, Conner & Armitage 1998)
  - Applied in development of environmental communications
    - Water conservation, NPS burn policies, recycling, agricultural conservation, etc.

# Social Research Methods

- Methodological triangulation: Qualitative research informs quantitative, stands on its own
- First stage: In-depth interviews with opinion leaders (n=52)
  - Respondents included: industry/business leaders, outreach/educators, community leaders, alpha neighbors, researchers and scientists
  - Open ended interview protocol
  - Purposive snowball sampling across five New England states
  - Data analysis using content analysis techniques (Glaser and Strauss 1969, Miles and Huberman 1984, Berg 2006)

## Qualitative Results: Sample Key Findings

- A perceived lack of knowledge exists among DIYers regarding effective lawn care techniques, including the proper application of fertilizers
- Opinion leaders believe there is a lack of recognition that home fertilization techniques are linked to water quality
- Many Opinion Leaders felt that alternative fertilizing methods would achieve results that satisfy most DIYers
- The standards of lawn care in a DIYer's community has a significant effect on that DIYers lawn related attitudes, values and ultimately their behaviors

# Sample Outreach/Education

## Take Home Messages

- Redefine what a healthy lawn is and promote a more reasonable/ attainable image of the desirable lawn
- Outline the benefits of a healthy lawn with emphasis on improved water quality and improved safety for child and pet recreation
- Refer to fertilizer(s) as a “lawn chemical(s)”
- For those set on obtaining the “backyard golf course” and are resistant towards accepting anything less, promote the effectiveness and money saving benefits of “spoon feeding”
- Illustrate the benefits alternative lawn care techniques
- Underscore the assertion that nutrients are nutrients regardless of their origin

# Social Research Methods

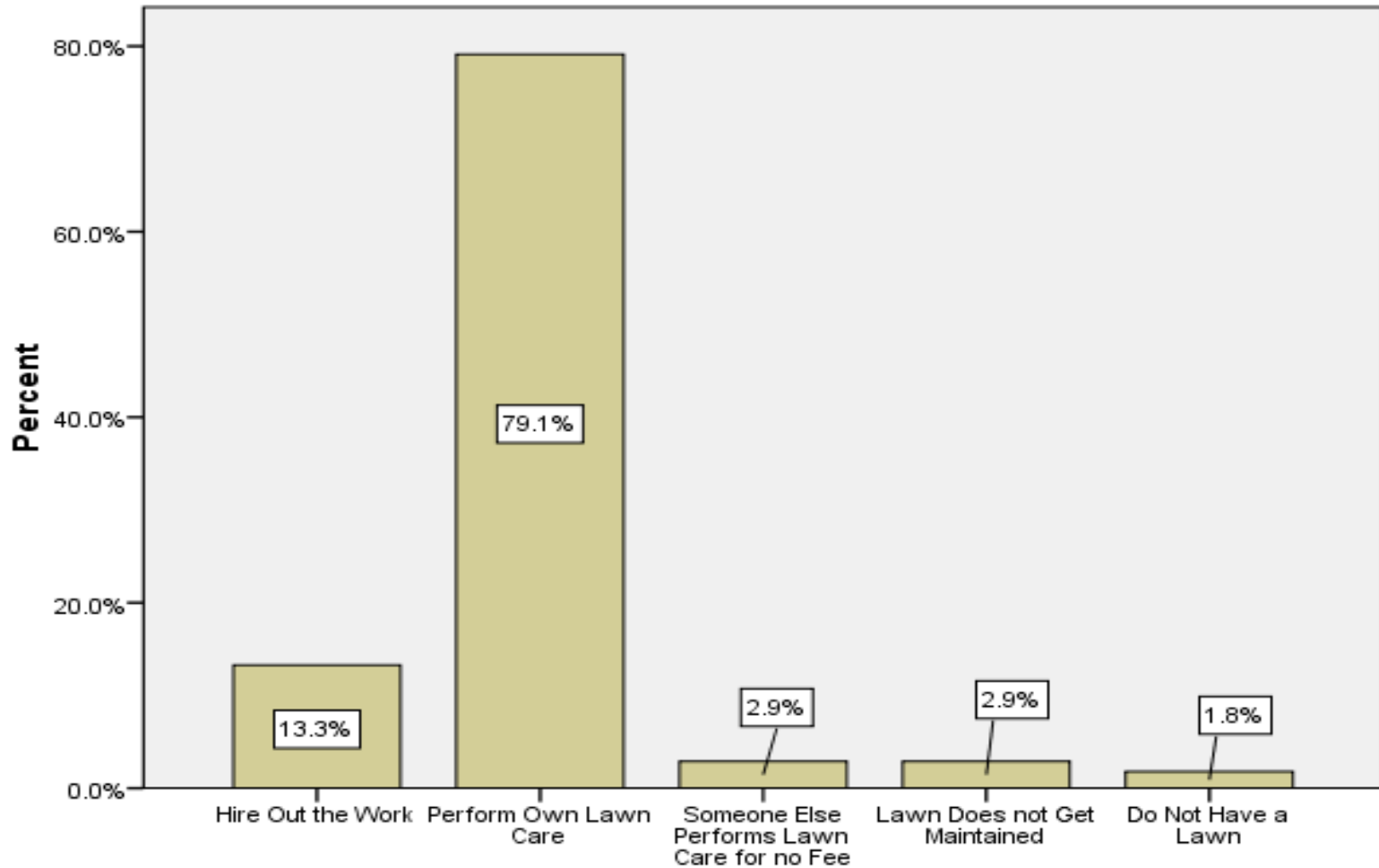
- Second stage: A scientific random sample survey
- Five communities purposively selected for survey research
  - Hampden, Maine
  - East Lyme, Connecticut
  - Milton, New Hampshire
  - Brandon, Vermont
  - East Kingstown, Rhode Island
- Sample frame built off publicly available records (SSI)
- Third stage: evaluation (to be conducted spring 2010)

# Survey Methods

- Survey administered using a modified Tailored Design Method (Dillman 2006)
  - Customized letters & community specific questionnaires
  - Carefully worded appeals
  - Carefully timed, four stage mailing process
- Two tier sample
  - 350 residents of each community
  - 80 residents of specified neighborhoods in communities
- SPSS used to record data and conduct analyses
  - Univariate, bivariate and multivariate analyses
- Statistical analyses show very few significant differences, combined sample data presented today
- 1848 eligible recipients, 754 returned, response rate 40.8%

# Why focus on DIYers?

Respondent's description of their Lawn Care Practices



# Sample Findings for Outreach/Education Development

- 49.8% of respondents believe that using organics addresses water quality issues related to fertilizer use
- Fertilizer impacts water quality (there is a lack of knowledge about basic information, particularly on the dynamics of the processes)
- 30.5% of respondents believe their work or business is economically dependent on the quality of their watershed
- 41.2% of respondents reported they use all fertilizer purchased to avoid storage

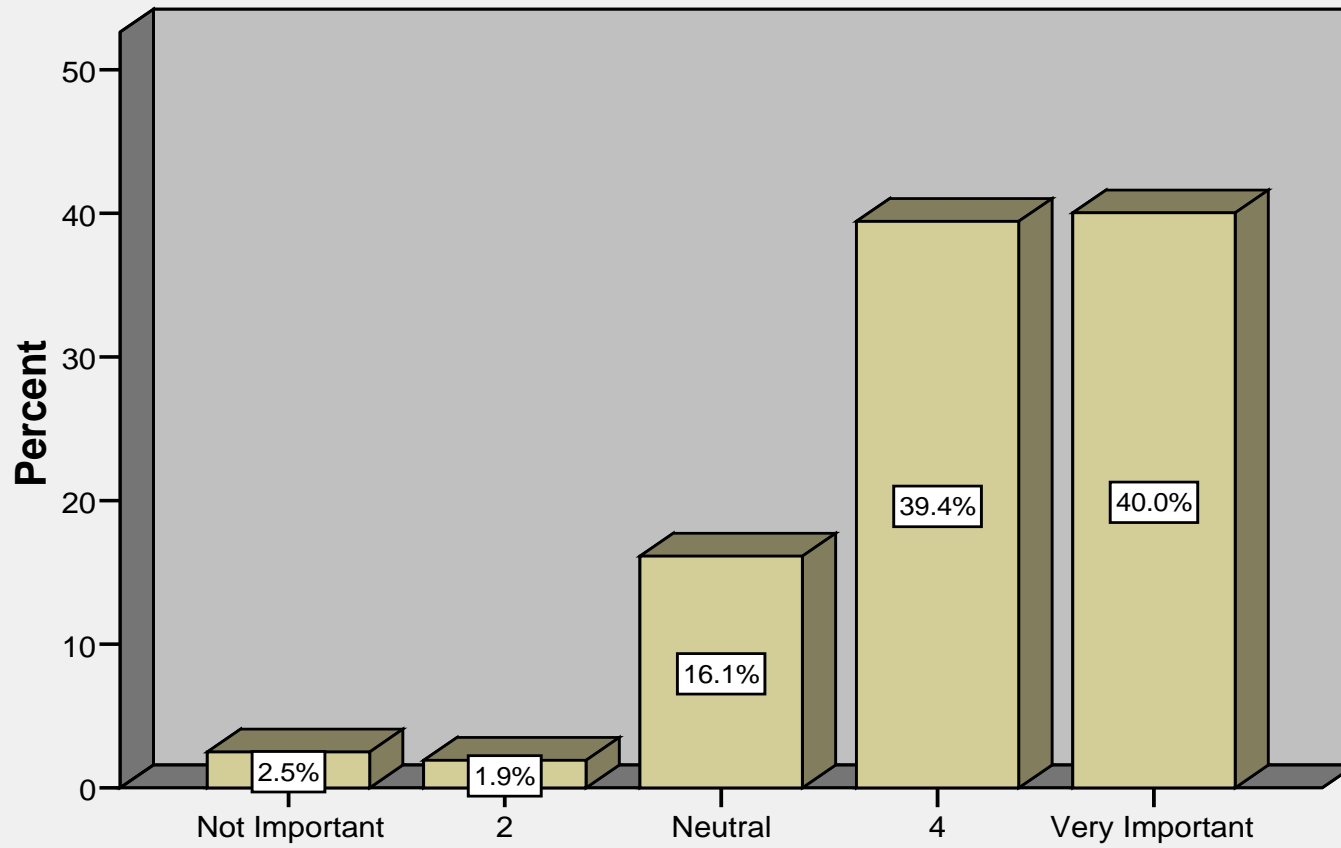
# Sample Findings for Outreach/Education Development

- Protecting family and pet health is important or very important to 78.4% of respondents
- Respondents are very accepting of several simple practices: (validates finding from qualitative)
  - using fertilizers that expressly protect water quality
  - cutting grass at a higher height
  - leaving clippings on the lawn
- Respondents indicate that it is not important that a lawn be clover-free

# Knowing The Audience: Important Factors

- 76.9% of respondents assert that it is important that their lawn look the same as it currently does if they adopt environmentally friendly alternatives
- Only a small portion of respondents (9.7%) believe alternatives cannot achieve the type of lawn they desire
- Linking the impacts of over-fertilization on water quality with a specific body of water is essential
- 30.5% of respondents believe their work or business is economically dependent on the quality of their watershed

## Importance of Protecting A Particular Body of Water.



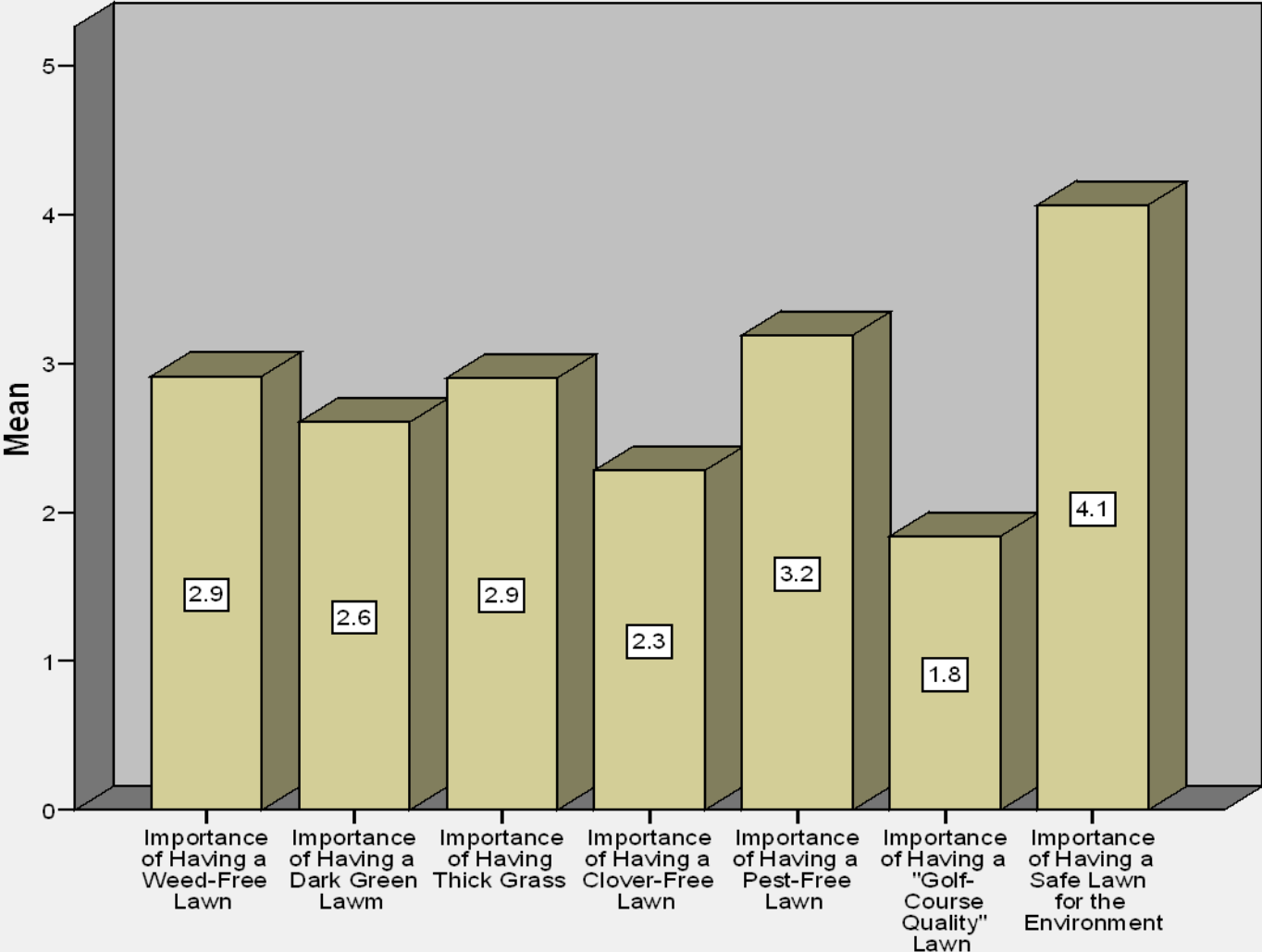
# Knowing The Audience: Important Factors

- The availability of information on alternatives is important to many respondents for them to consider adopting them (41.6%)
- Concern about environmental issues varies across the region
- Most respondents are satisfied with their lawn's appearance
  - 40.2% agree or strongly agree that fertilization is important for achieving the lawn they desire
  - Only 53.3% of respondents state they use fertilizer on their lawn
  - 20.6% of respondents indicate they use fertilizer 4 or more times per year

# Using Social Norms: Key Findings

- “Fitting in” is important to most respondents
  - 69.7% agreed or strongly agreed that they want their lawn to look good enough to fit into their community
  - 46.1% agreed or strongly agreed with the assertion that community members have a responsibility to adhere to community standards of lawn care
  - When asked about what features of a lawn are most important, the most common response was that lawns be safe for the environment

# Respondents Mean Rating of the Importance of Each Lawn Issue



# Message Delivery

- A point of purchase effort may be essential for success
  - Results from both the survey and interviews indicate the timing of the messages is important
  - The most commonly used source of information on lawn care is product packaging
- Media sources are not widely used or trusted
- Master gardeners and University Extension are considered the most trustworthy information sources
  - being clear about affiliations is useful and appropriate

# Conclusions

- The project exemplifies how social science has utility for improving efforts to affect change
  - Explains current lawn care behavior and attitudes
  - Identified vectors for message delivery
  - Identified key barriers
  - Identified key topics for messages
  - Informs the use of normative approaches to change
- Interdisciplinary approaches require expertise: work together
- Overall, results encouraging for project goals and efforts to affect water quality if outreach is carefully designed

# Thank you for your time

For Further Information Contact:

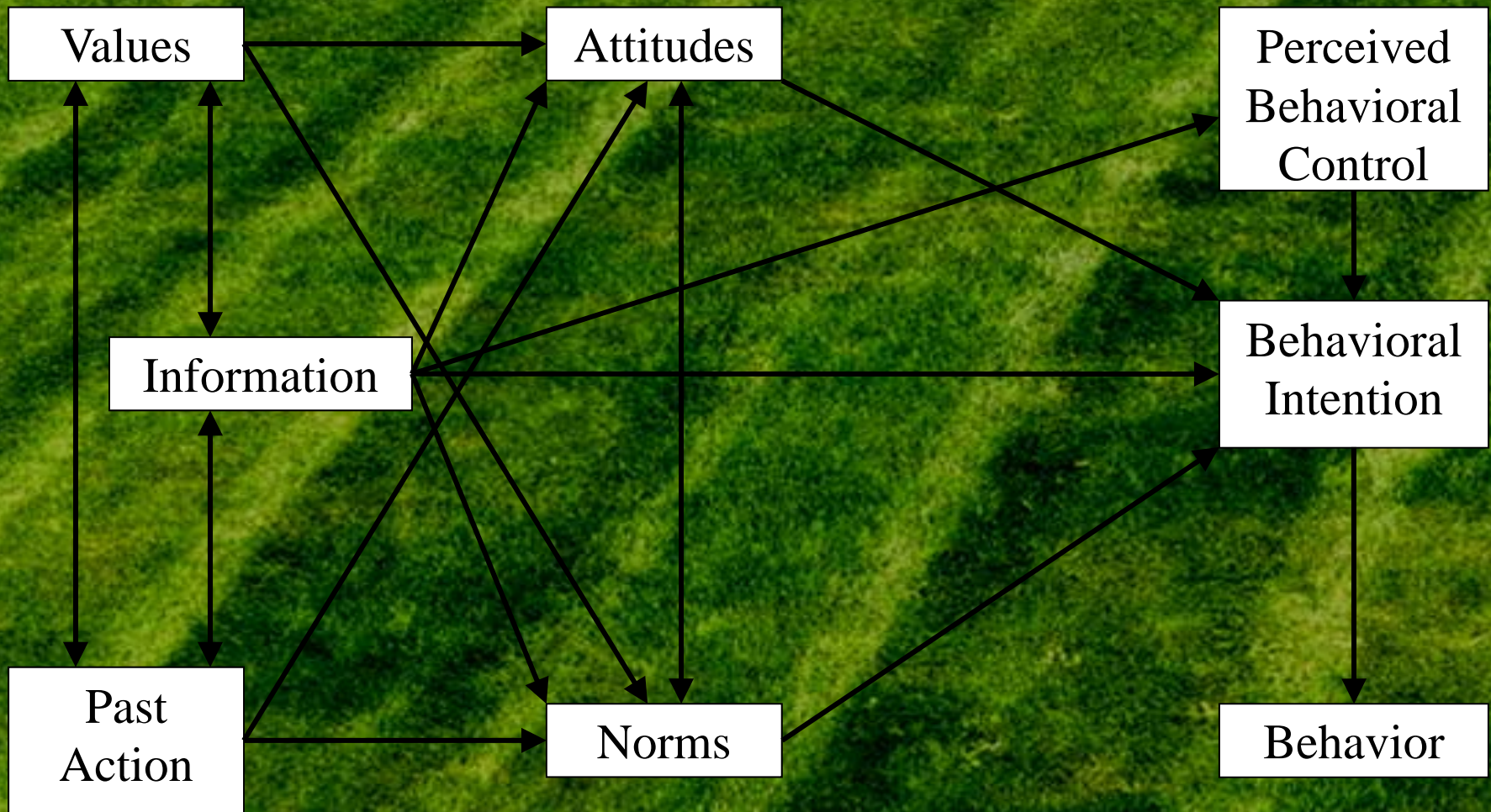
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*The remaining slides are*  
*contain supporting evidence in*  
*case questions arise requiring*  
*the presentation additional*  
*material.*

# Examples of Conclusions from Social Science Research: Messages & Their Delivery

- Multiple perspectives exist on a fundamental level, and good communications must...
  - Understand differences and their depth
  - Incorporate them in the design of communications
- Place matters, so use it by tailoring messages
- Understand currently perceived barriers
- Assessing use of, and trust in, information sources is important and directly applicable
- Commitments are valuable motivators and may affect norms in the long term
  - Should be public, visible, and active

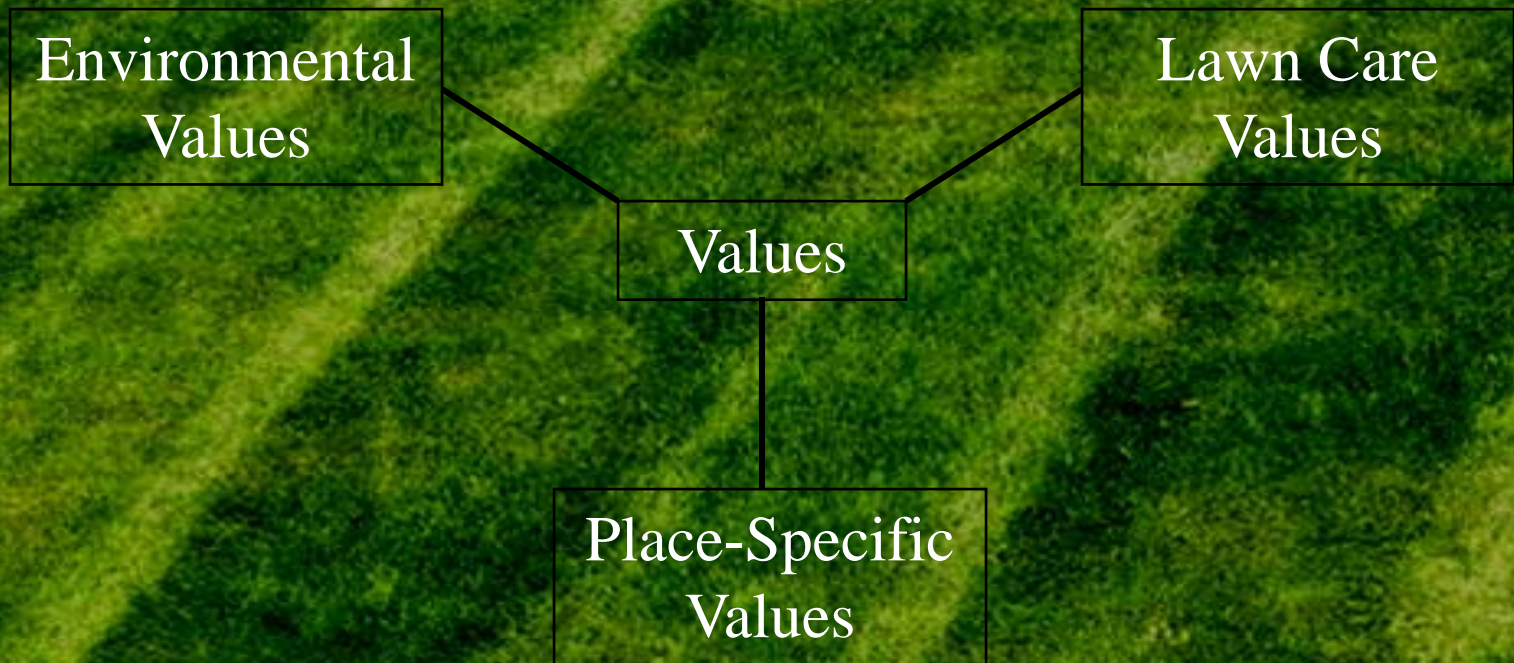
# Augmented TPB Theoretical Model of Hypothesized Relationships Influencing Lawn Care Behavior



# Examples of More Specific Variables Examined in the Theoretical Model

•Broad environmental values	•Frequency of contact with information sources
•Landscaping values	•Perceived importance of various messages
•Attitudes towards lawn care related issues	•Preferences for message delivery (information)
•Attitudes towards lawn care techniques	•Past actions
•Knowledge of environmental issues (information)	•Current lawn care practices •(including soil test use)
•Knowledge of lawn care related issues (information)	•Anticipated lawn care practices
•Relative trust in various information sources	•Perceived neighborhood lawn care norms
•Place attachment – social and natural dimensions	•Perceived barriers to the adoption of techniques and practices that minimize the negative impacts of nutrient application

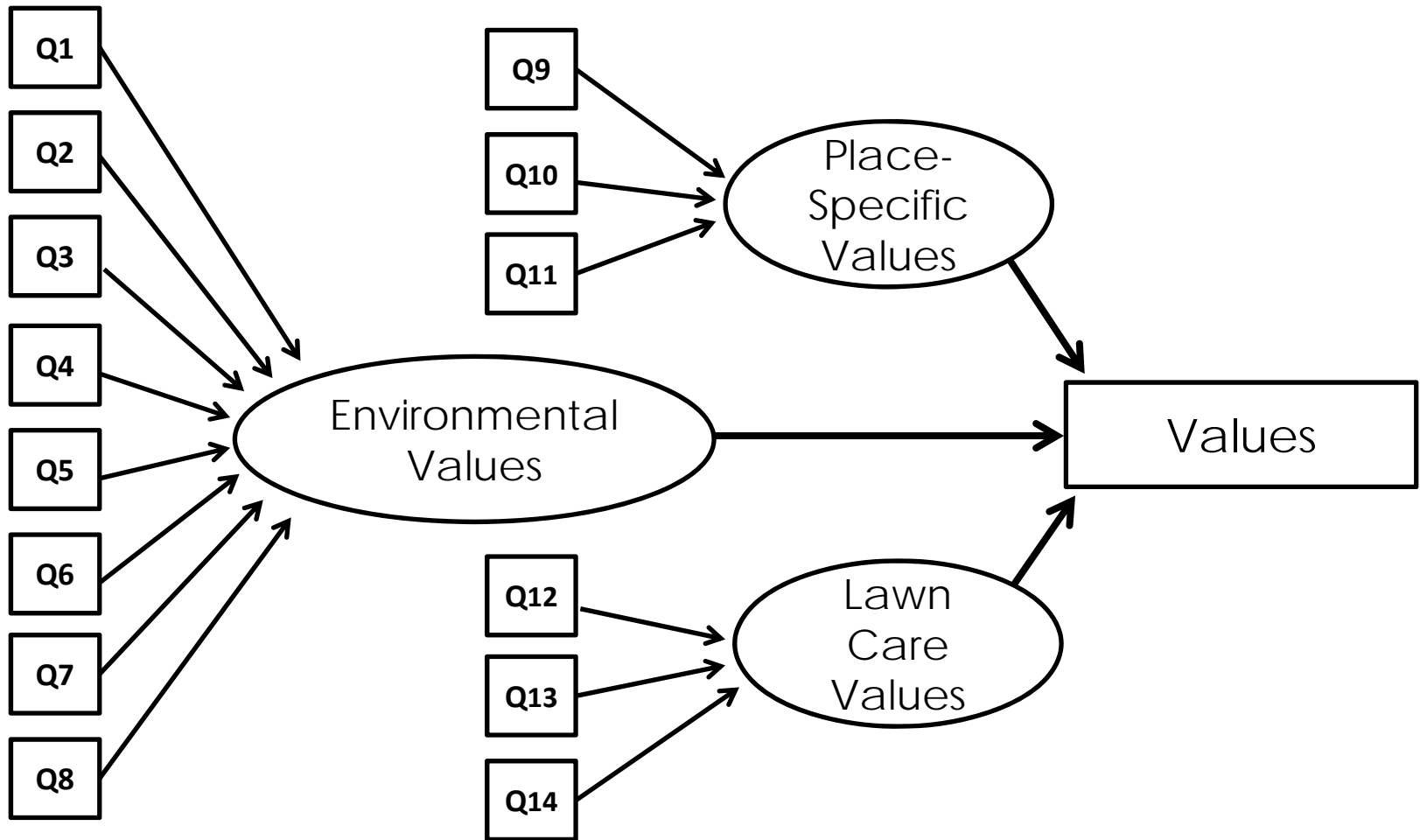
# Detailed Value Factor in the Augmented TPB Theoretical Model of Hypothesized Relationships Influencing Lawn Care Behavior



## Questions on the NEP Index (using a Likert Scale)

- 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.

# Construction of Values Factor



# Measuring Environmental Values

- Measuring environmental values is a long and well-researched topic
- Dunlap and Van Liere (1977): New Ecological Paradigm Scale
  - Uses an index of scaled questions to measure proenvironmental orientation
  - Scaled questions are statistically treated as an index to produce an overall environmental values measure
  - Revised repeatedly over time, used in many studies
  - Well supported in studies of behavioral intentions (Vining et. al. 1999; O'Connor et. al. 1999; Dunlap et. al. 2000)
  - Conceptualized as commitment to the *Dominant Social Paradigm* or to the *New Ecological Paradigm* (Leopold view)