Message Framing Matters:
Communicating Climate Change with Forest Landowners

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Introduction

Climate change communication is notoriously difficult. Forest landowners will play a vital role in the adaptation to and mitigation of climate change effects. This study aims to find an effective way to communicate climate change science to **forest landowners in the Southeast** with video.

Barriers to communication of climate change:
- Causes are invisible
- Impacts lack immediacy
- Impacts are distant[1]
- Well-funded climate skepticism campaign[2]

Why video?
- Visual learning is very effective
- Reaches a large audience
- Personalize imagery
- Quickly and easily digested[3]

A Framework for Communication

Diffusion of Innovations

"Diffusion is the process by which an innovation is communicated through certain channels over time among the members of a social system[4]." Adaptation and mitigation strategies can be regarded as innovations. In the context of the social system, *homophily* is the degree to which two communicators perceive themselves to be similar.

Message Framing

Framing messages in specific ways is an effective strategy for communicating difficult, confusing, or controversial information to different audiences.[5]

Elaboration Likelihood Model

Messages should be designed to increase the thinking (i.e., elaboration) of an audience. Both personal relevance and multiple sources of information help increase elaboration.[6]

Research Questions

Based on the literature review conducted, it is clear that people need more than just knowledge to be motivated to change attitudes or behaviors. Since we do not know yet what values and variables will be most motivating for this audience, this study will use different videos to explore 3 research questions:

1. How does framing a video in the context of climate change affect attitudes toward forest researchers and forest landowners?
2. Are university researchers and local forest landowners trusted sources of information to forest landowners? Does the mention of climate change influence this trust?
3. Which values, presented in a video, are more effective in motivating participation by landowners: economics or stewardship (egoistic or biospheric)? How do previously held values and attitudes impact how landowners view each video?

Methods

Four videos were created featuring interviews with forest landowners and PINEMAP researchers. The videos demonstrated the research that PINEMAP is doing with regard to management of loblolly pine plantations in the Southeast and the potential for climate variability to affect forests, as well as explore management strategies landowners are taking on their land to prepare for future climate uncertainties. **Figure 1** below shows which videos featured which variables to be tested in the study. **Figure 2** provides a link to the video Steward-Climate.

Videos were sent electronically to forest landowners across the Southeast. A pre- and post-survey gathered data relating to the research questions. Data from the survey questions were analyzed using JMP Statistical[7] software and Excel. Pre and post questions that were the same were evaluated for significant differences. Simple regression was used to find correlations between independent and dependent variables. Two-tailed t-tests measured differences in pre- and post-survey responses. ANOVA determined if means were significantly different, and given a small p-value for the ANOVA (< .05), Tukey's HSD test was used to compare means.

	Researcher **with** Climate Change 	Researcher **without** Climate Change 
Landowner with **stewardship** frame 	Steward-Climate	Steward-Health
Landowner with **economic** frame 	Timber-Climate	Timber-Health

Figure 1. The matrix design of this study. For example, in "Steward-Climate," the Researcher mentioned climate change and the landowner's piece focused on stewardship of the land, as opposed to "Steward-Health", where the landowner focused on stewardship, but the researcher did *not* mention climate change.

Figure 2. QR Code link to Video 1: Steward-Climate.

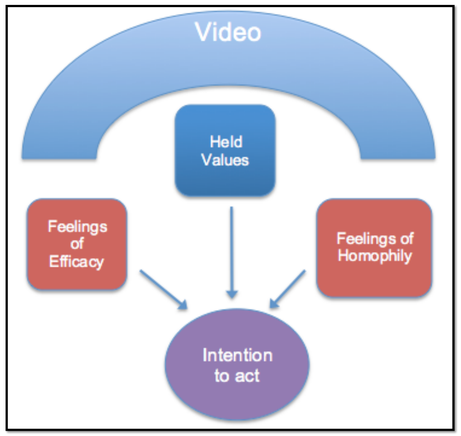

Figure 3. Model for creating intention to adopt or change forest management practices to mitigate or adapt to climate change through video.

Results

The online survey generated 199 completed responses. Majority of respondents were older (mean age= 61 years), white (90%), and male (78%), which matches the population of non-industrial forest landowners well.[8] Their objectives for their land mirrored the population as well.

Research Question 1: Influence of Climate Change on Attitudes
- 'Liking the video' same for all 4 videos.
- The more a respondent accepted climate change, the more they liked the landowner (R^2= .085, p= .039) and researcher (R^2= .089, p= .035) in Steward-Climate.
- Those who don't believe in human-influenced climate change liked the speakers and video less.

Research Question 2: Effects of Homophily and Trust
- Viewers trust speakers (landowner M= 3.33, researcher M=3.42 on scale of 1-4)
- Respondents felt homophilous with landowner (M=3.58) and researcher (M=3.44) on scale of 1-5.
- Homophily with the landowner was related to trusting the landowner (R^2= .134, p< .001), and homophily with the researcher related to trusting the researcher (R^2= .101, p< .001).
- Finding a video useful & interesting influenced by homophily with the researcher (R^2= .089, p< .001) and the landowner (R^2= .061, p< .001).
- Feeling homophilous with the landowner (R^2= .06, p< .001) and the researcher (R^2= .084, p< .001) also explained increased intention to adopt forest management practices.

Research Question 3: The Influence of Values on Motivation and Attitudes
- Three of the videos increased feelings of efficacy (all but Timber-Climate).
- Results from ANOVA show that the means for a respondents' intention to take action were not different between videos.
- Holding higher egoistic values increased intention to act when watching Timber-Climate (R^2= .099, p= .049), and holding higher biospheric values increased intention when watching Timber-Health (R^2= .098, p= .041).
- More strongly held values increased intention (R^2= .029, p= .017).

Conclusions

The results of the survey tell us a few important things:
- All four videos were able to motivate intention to act. Three were also effective in increasing feelings of efficacy (all but Timber-Climate). Evidently, for forest landowners to be motivated to act on climate change, there needed to be more than an economic incentive. This means that **in order to increase intention to adopt new forest management strategies to adapt to climate changes, communicators must draw upon more than economic values.**
- **Homophily** is important to foster trust.
- When **values portrayed in the video** aligned with viewers' values, they were more likely to like the videos, trust the speakers, and feel an intention to act.
- Because there is diversity in the population, videos about forest management and climate change portraying multiple values, attitudes, and objectives **may help increase feelings of efficacy and homophily, and therefore increase intention to act (Figure 3).**

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