8-17-2016

Downstream Pollution 2: Does Framing Affect Genders Differently?

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AGRICULTURAL ECONOMICS

August 17, 2016

agecon.unl.edu/cornhuskereconomics

Cornhusker Economics

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Market Report	Year Ago	4 Wks Ago	8/17/16
Livestock and Products, Weekly Average			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.	150.71	117.00	118.00
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	254.63	162.07	165.75
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	227.57	153.02	158.39
Choice Boxed Beef, 600-750 lb. Carcass.	242.66	206.00	200.54
Western Corn Belt Base Hog Price Carcass, Negotiated	77.23	72.99	63.75
Pork Carcass Cutout, 185 lb. Carcass 51-52% Lean.	89.33	89.41	75.19
Slaughter Lambs, wooled and shorn, 135-165 lb. National.	156.89	161.90	163.35
National Carcass Lamb Cutout FOB.	357.59	324.44	351.94
Crops, Daily Spot Prices			
Wheat, No. 1, H.W. Imperial, bu.	4.33	3.09	2.99
Corn, No. 2, Yellow Nebraska City, bu.	3.46	3.21	2.99
Soybeans, No. 1, Yellow Nebraska City, bu.	9.43	10.12	9.42
Grain Sorghum, No.2, Yellow Dorchester, cwt.	6.02	5.04	4.50
Oats, No. 2, Heavy Minneapolis, Mn, bu.	2.63	2.69	2.30
Feed			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	178.00	165.00	163.75
Alfalfa, Large Rounds, Good Platte Valley, ton.	85.00	75.00	72.50
Grass Hay, Large Rounds, Good Nebraska, ton.	95.00	80.00	*
Dried Distillers Grains, 10% Moisture Nebraska Average.	140.00	127.50	122.50
Wet Distillers Grains, 65-70% Moisture Nebraska Average.	43.00	37.50	*

*** No Market**

About a year ago we published the article "Downstream Pollution: Do Gender and Emotion Matter" (Cornhusker Economics, September 23, 2015) reporting the gender effects with respect to expressing positive and negative emotions in the downstream pollution game. We found that expressing positive emotions does not result in higher levels of conservation and, thus, does not significantly affect the quality of downstream water regardless of the gender of the polluter. At the same time, expressing negative emotions was more effective in increasing conservation and achieving cleaner water downstream. Notably, in contrast to our expectations, men responded to negative emotions with a larger increase in conservation levels than women did. In this article, we further explore the gender differences in the environmental context; specifically, we test whether framing affects women and men differently.

Experimental economics studies report that framing (the way the problem is worded, for instance emphasizing positives rather than negatives, asking people to give rather than take) has a pronounced effect on individual and group behavior. Small changes in wording can lead to different choices. In our framed laboratory experiment, we test whether empathy and self-interest framing significantly differ from neutral framing and how they affect the choices of men and women. The experiment was conducted in the Experimental and Behavioral Economics Laboratory of the Department of Agricultural Economics at the University of Nebraska-Lincoln. Forty-five percent of the participants (216 in total) were females. The participants were students and members of the public. The choices of participants during the game determined their earnings, which, on average, equated to $28.90.

The downstream water pollution game was played in groups of three: the players representing upstream farmers (UF), downstream water users (DWU), and the players with the dual role (who were simultaneously upstream farmers and downstream water users; UF/DWU). UFs and UF/DWUs had to choose how much of their land to put under conservation tillage. Their decision on conservation impacted their profit, the profits of the downstream water users, and the water quality downstream. Specifically, a relatively higher level of conservation led to lower farmer's profits, while decreasing the pollution level of the downstream water, which, in turn, resulted in higher profits for downstream water users.

The experiment had 3-treatments (TR): Empathy, Self-interest, and Neutral. Loaded language was used in the Empathy and Self-interest treatments, and context-free language was used in the Neutral treatment. In the Empathy treatment, participants were nudged towards more empathetic behavior. After all participants were presented with the explanation of the game, the participants in the Empathy treatment received the following message: *"The choice of tillage by farmers will greatly affect the water quality of the lake and the payoff for the Downstream Water User. A cleaner lake and higher payoff for the DWU will be assured if the farmers choose to place* ***more*** *land under Conservation Tillage.* In the Self-interest treatment, participants were nudged toward more selfish behavior. After all participants were presented with the explanation of the game, the participants in the Self-interest treatment received the following message: *"The choice of tillage by farmers will greatly affect their own profit. The farmers get higher profit if they choose to place* ***more*** *land under Intensive Tillage."* There was no nudging in the Neutral treatment.

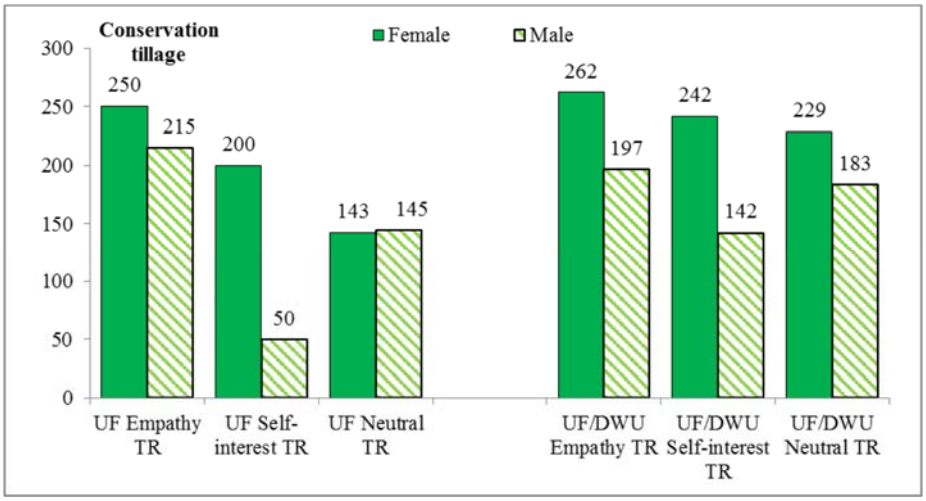
Several previous studies found that women exhibit more pro-environmental behavior and are more likely to contribute to environmental causes. Our data only partially supports that. While we observed gender differences in the conservation levels (see Figure), most of those are not statistically significant.

Regarding the framing effects, previous studies are inconclusive: some studies found that women are more sensitive than men to the framing of experiments (including design and context), while other studies found that framing affects the behavior of men and women equally. Even though we observe economic difference in behavior of women playing the role of upstream farmers in the Empathy versus Self-interest treatments (250 vs. 200 acres under conservation), it is not statistically significant.

The difference between the Empathy and Neutral treatments, however, is both economically and statistically (at 10%) significant (250 vs. 143 acres under conservation). Neither women nor men playing a dual role differ in their choice of conservation levels across treatments. Male upstream farmers, on the other hand, show a statistically significant difference in their behavior between Empathy and Self-interest (215 vs. 50) and even between Self-interest and Neutral treatments (50 vs. 145 acres under conservation). To summarize, women were not very sensitive to the nudges for empathy or self-interest and demonstrated a greater overall willingness to share than men did. Men, on the other hand, were quite sensitive to self-interest and less to empathy nudging.

In terms of environmental policy implications, our research suggests that the policy-makers should be cautious when using different framing/wording to promote conservation programs and to attract new adopters. Concentrating solely on the monetary aspects and outlining only the payoffs for the adopters, may actually hinder the increase in the conservation programs' uptake rates.

Figure: Conservation Levels in Different Treatments by Gender



This article is based on:

Khachaturyan M. Dissertation (2014) *Transboundary Waters: Using Game Theory in Theoretical and Experimental Studies to Analyze the Management of Upstream- Downstream Water Problems,* Chapter "Gender Effects in Environmental Decisions and Emotions", pp. 1-79.

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