

Consumers' Perceptions & Willingness to Pay for Nuclear Power

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Grant A. Wilson, PhD

- Associate Professor of Marketing & Innovation
 - Hill & Levene Schools of Business, University of Regina, Canada (2021-present)
 - Edwards School of Business, University of Saskatchewan, Canada (2018-2021)
- Research
 - Published over 30 peer-reviewed articles in marketing, strategy, and innovation journals including *Technological Forecasting & Social Change*, *Journal of Small Business Management*, *Research-Technology Management*, etc.
 - Research featured by The World Economic Forum and in Canada's national newspapers (*National Post* and *The Globe & Mail*)



U.S. Nuclear Study (2024)

- Used Prolific for data collection
- U.S. sample
- 597 usable responses
 - Age ranged from 18 to 80 years old
 - 42.2% male, 55.1% female, 2.6% non-binary/other
 - Education ranged from less than high school to a doctoral degree
 - Income ranged from less than 10,000 USD to over 150,000 USD



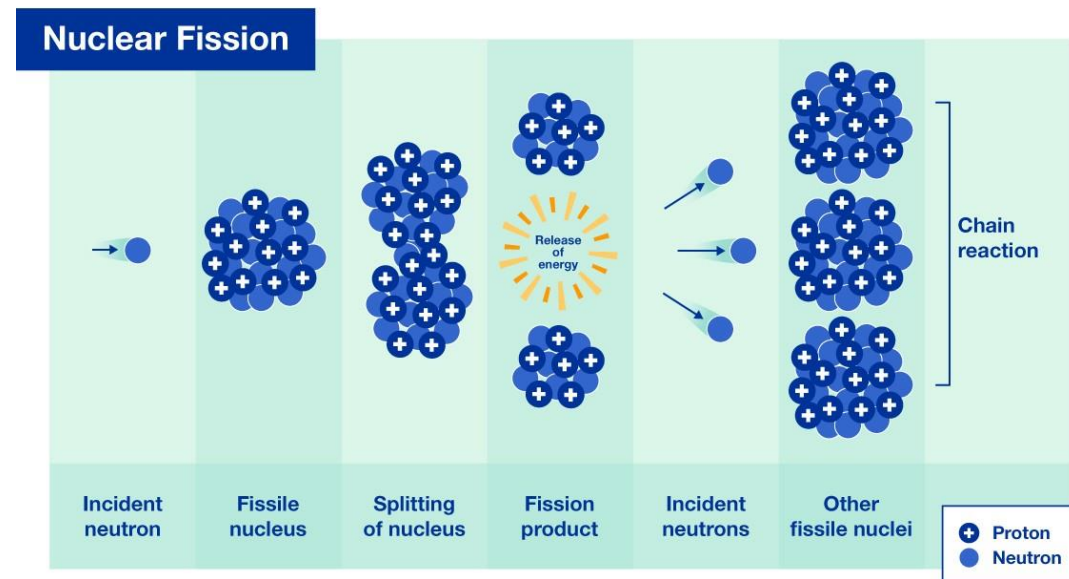
Exploration of...

- Support for nuclear power
- Scientific knowledge (science and nuclear power)
- Psychological variables (e.g., actively open-minded thinking and overconfidence)
- Conspiracy beliefs
- Willingness to pay (WTP) for nuclear power
- Value propositions' effect on support and WTP



Scientific knowledge

- We asked five true/false questions about nuclear power
- An individual's score was created by adding the correct answers (out of five)



Nuclear power knowledge

- Nuclear power plants emit large amounts of pollution (58.6%)
- Disposal of nuclear waste is a significant challenge (92.6%)
- Nuclear power plants can provide a stable and reliable source of energy (92.4%)
- Uranium and plutonium are used to fuel nuclear fission reactors (89.0%)
- Radioactive waste becomes harmless after just a few years (88.7%)



Actively open-minded thinking about evidence (AOT-E)

- 1) A person should always consider new possibilities
- 2) People should always take into consideration evidence that goes against their beliefs
- 3) It is important to preserve your beliefs even when it is brought to bear against them (reverse-coded)
- 4) Certain beliefs are just too important to abandon no matter how good a case can be made against them (reverse-coded)
- 5) One should disregard evidence that conflicts with your established beliefs (reverse coded)
- 6) Beliefs should always be revised in response to new information or evidence
- 7) No one can talk me out of something I know is right
- 8) I believe that loyalty to one's ideals and principles is more important than open-mindedness (reverse-coded)

5-point Likert scale from 1 (definitely not true) to 5 (definitely true)



Overconfidence

Overconfidence is the difference between one's estimated performance and actual performance on a number of questions, such that those who overestimate their performance are considered overconfident



AOT-E and overconfidence

	AOT-E	Overconfidence	Knowledge	Support	WTP
AOT-E	1				
Overconfidence	-.191**	1			
Knowledge	.207**	-.632**	1		
Support	.083*	-.037	.232**	1	
WTP	.113**	.079	.075	.378**	1

** $p < 0.01$



Conspiracy beliefs

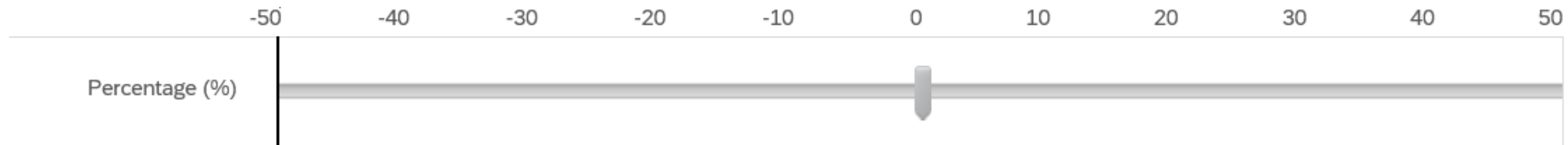
- We asked individuals to assess the truthfulness of five conspiracies including:
 - 1) Industry and governments have covered up the extent of nuclear disasters in order to maintain support for nuclear energy
 - 2) Industry and governments have suppressed research showing the harmful effects of low-level radiation in nuclear power facilities and communities with nuclear power plants to maintain public support for nuclear power
 - 3) Industry and governments have deliberately downplayed studies that show increased cancer rates among populations living near nuclear power facilities in order to maintain public support for nuclear power
 - 4) Industry routinely manipulates safety reports for nuclear power plants to meet regulatory requirements and maintain government support for nuclear power
 - 5) Governments and industry have secretly and illegally disposed of nuclear waste in oceans, unmarked sites, and transported to remote areas to avoid safety measures and reduce costs



Willingness to pay (WTP)

- WTP for nuclear power (no value proposition and various value propositions) was assessed via a slider from -50% to +50%, relative to other non-nuclear power sources

How much less or more (in percentage, %) would you be willing to pay for nuclear power, as compared to other energy sources (renewable and non-renewable)?

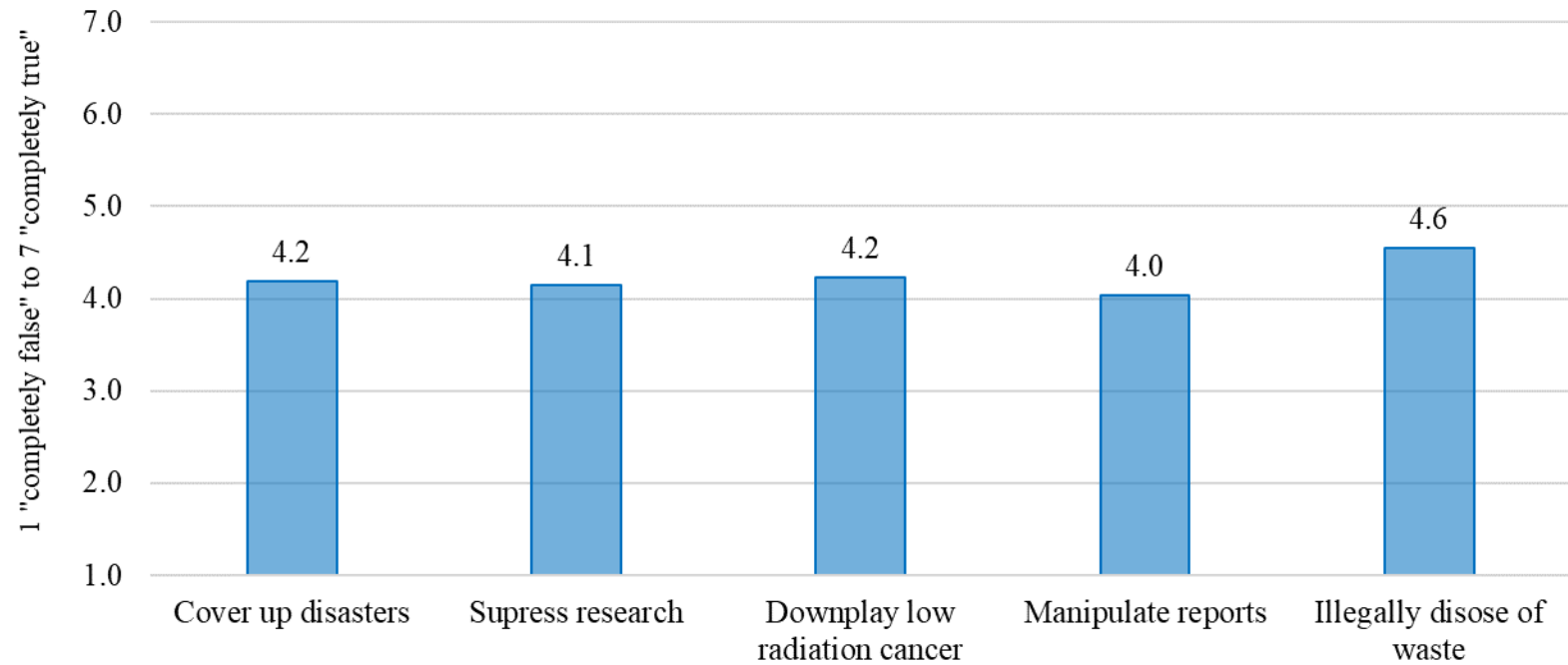


Conspiracy beliefs

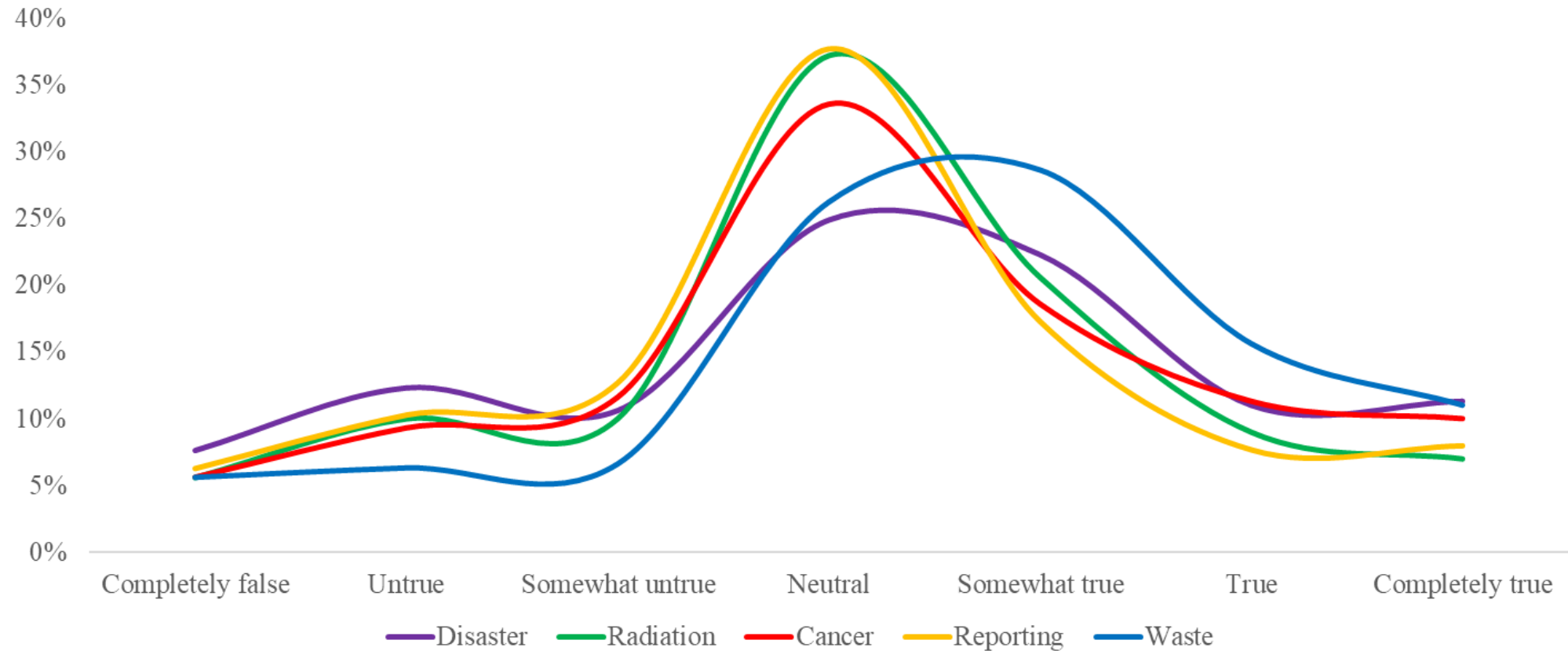
- Which do you think is the most widely believed?
 - Cover up disasters
 - Suppress research
 - Downplay low radiation cancer
 - Manipulate reports
 - Illegally dispose of waste



Conspiracy beliefs

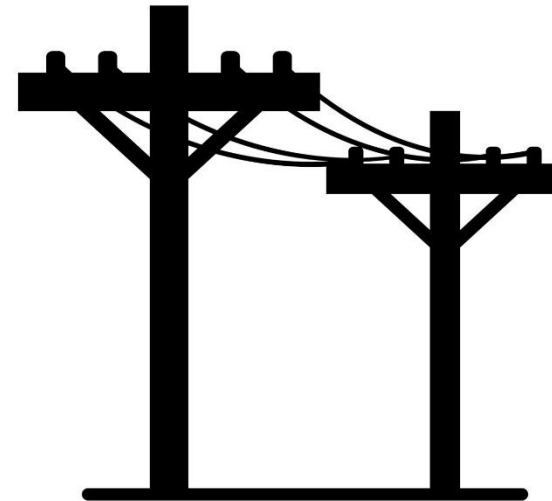


Conspiracy beliefs

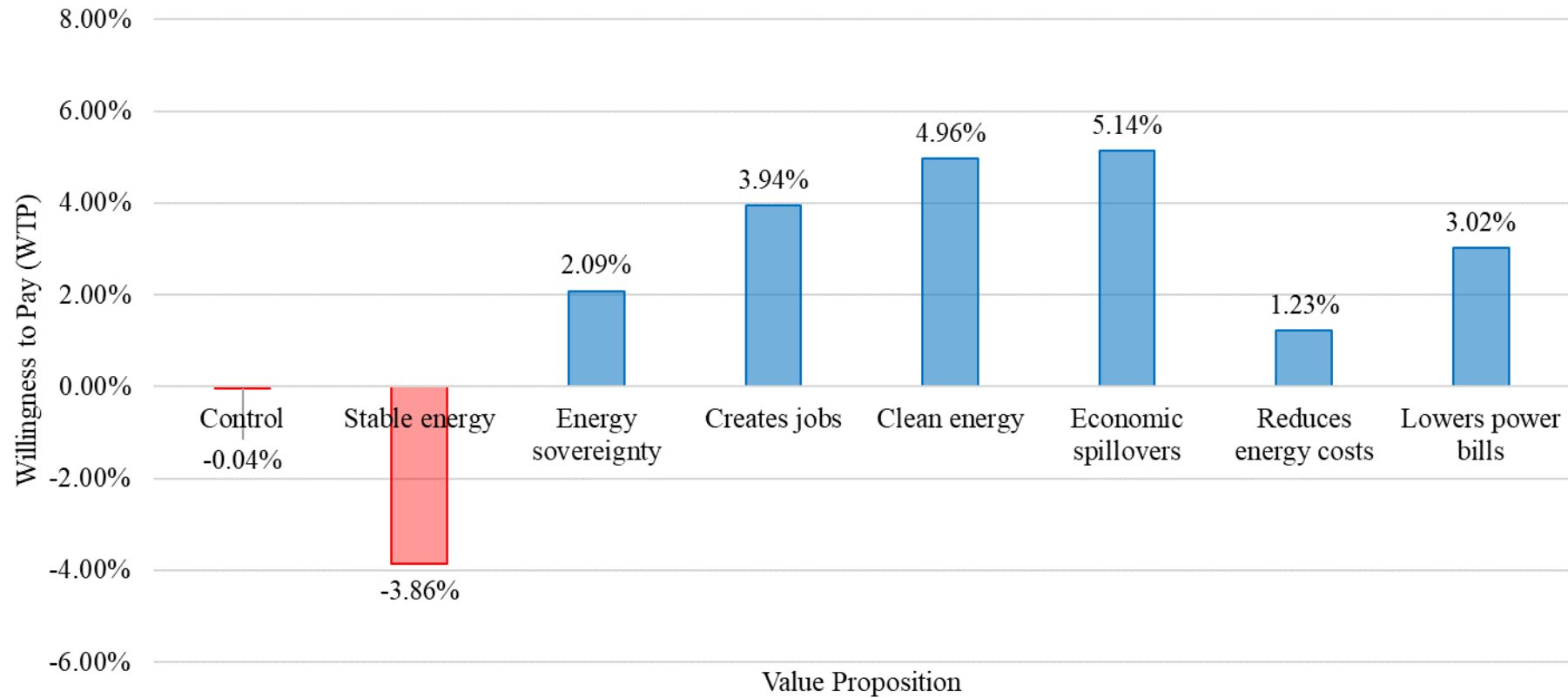


Value propositions

- Which value proposition do you think would be the most effective?
 - No value proposition
 - Stable and reliable energy source
 - Provides energy sovereignty
 - Creates jobs
 - Clean energy source
 - Reduces energy costs
 - Lowers power bills



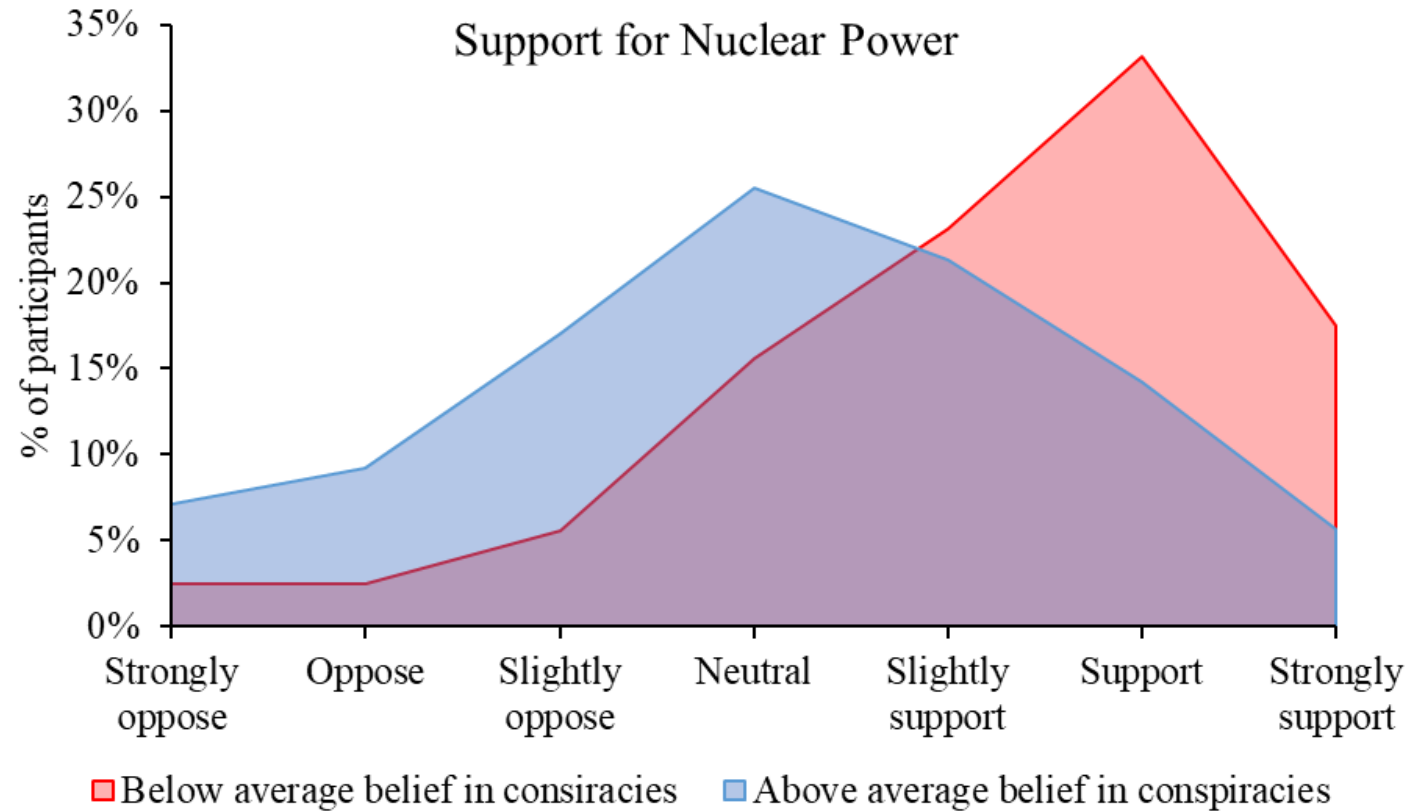
Value propositions and WTP



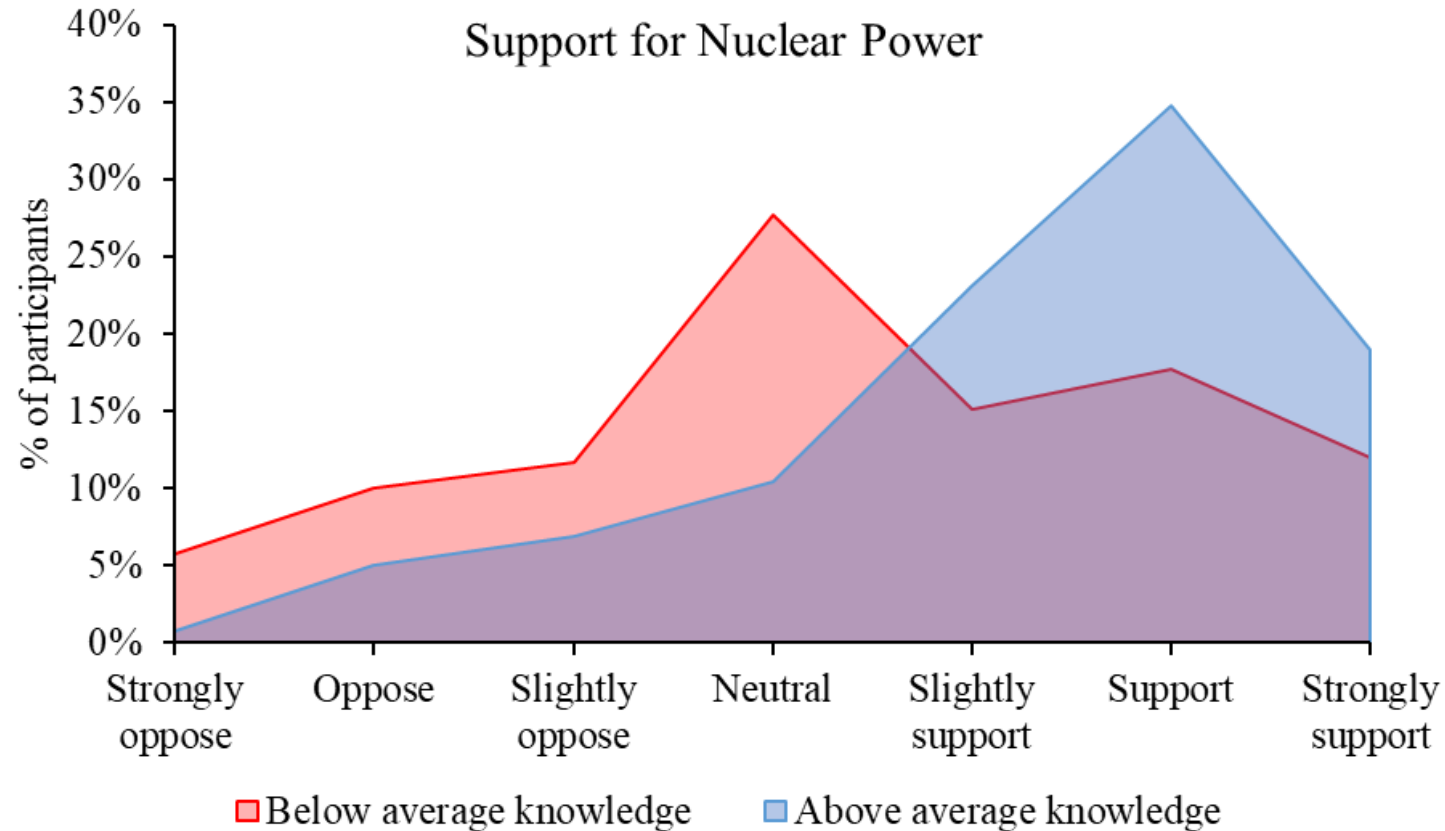
**WTP as compared to non-nuclear alternative*



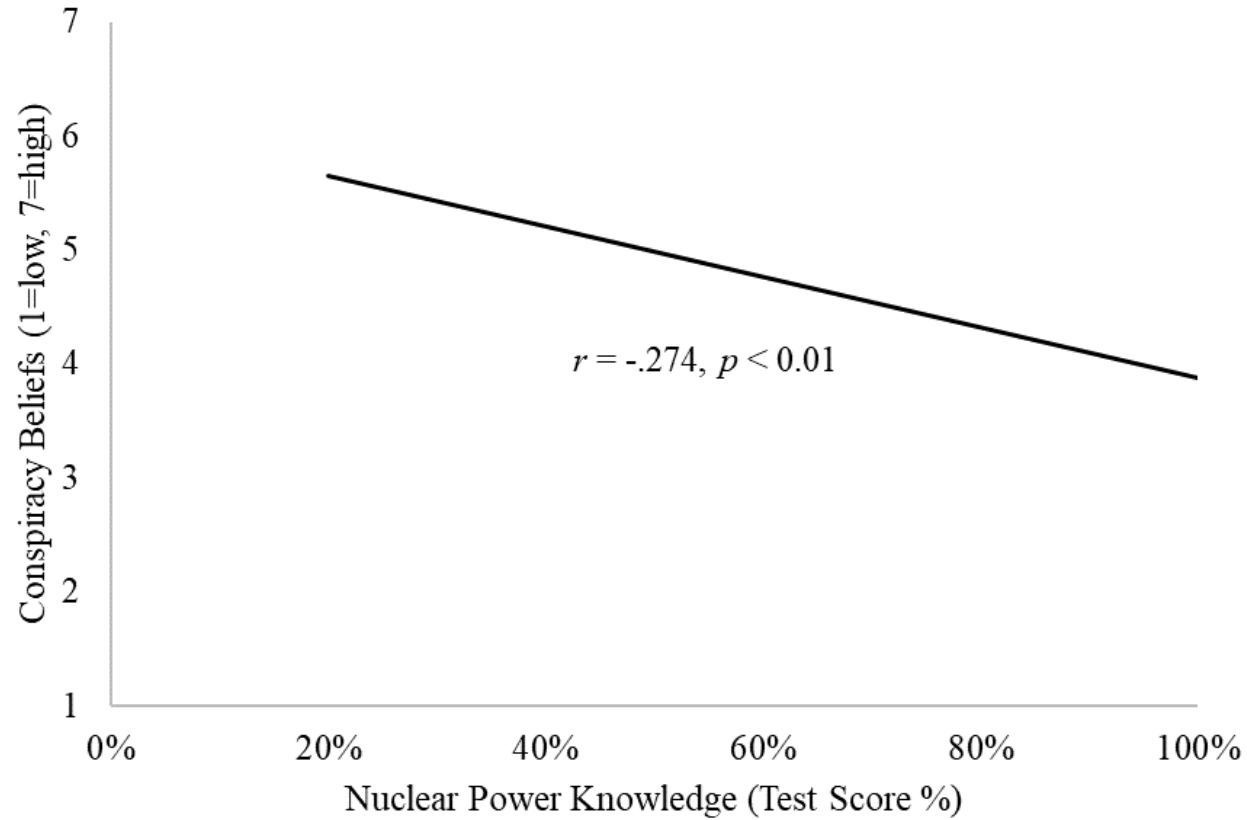
Support for nuclear power and conspiracy beliefs



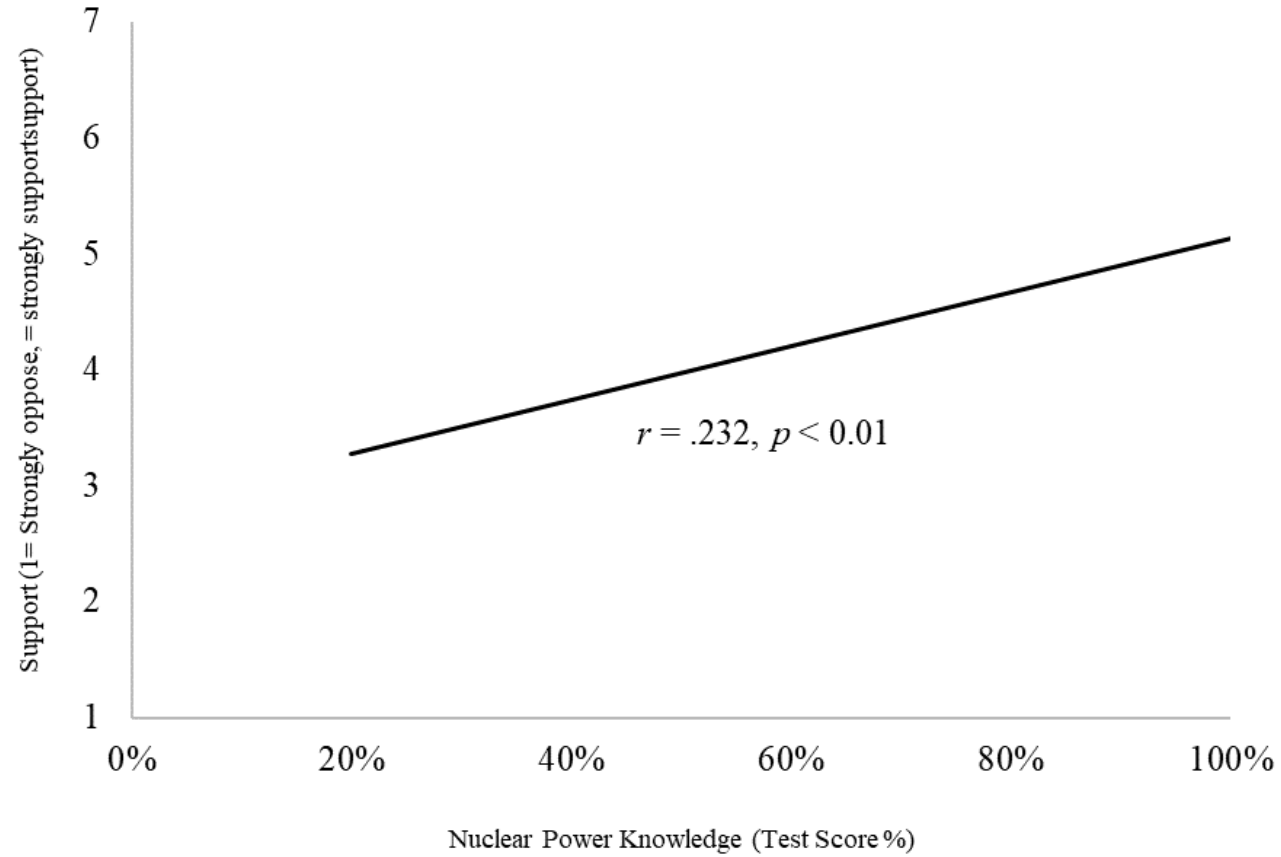
Support for nuclear power and knowledge



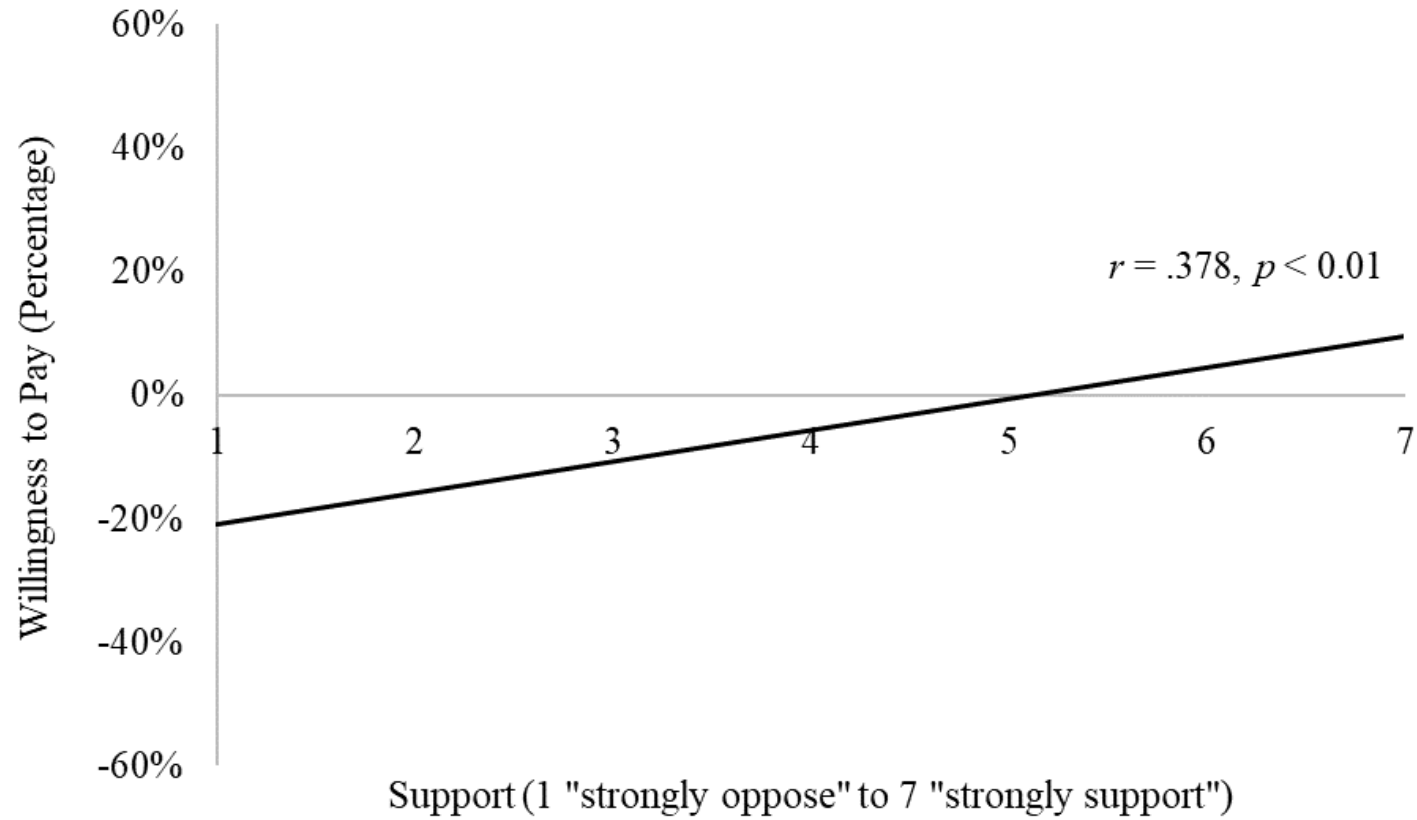
Knowledge and conspiracy beliefs



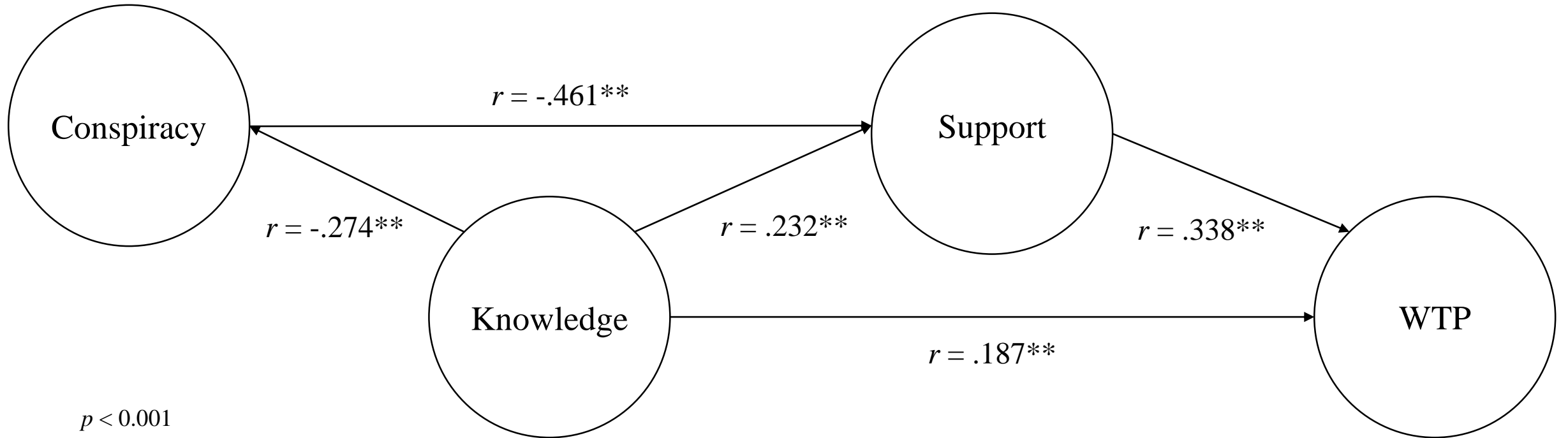
Knowledge and support



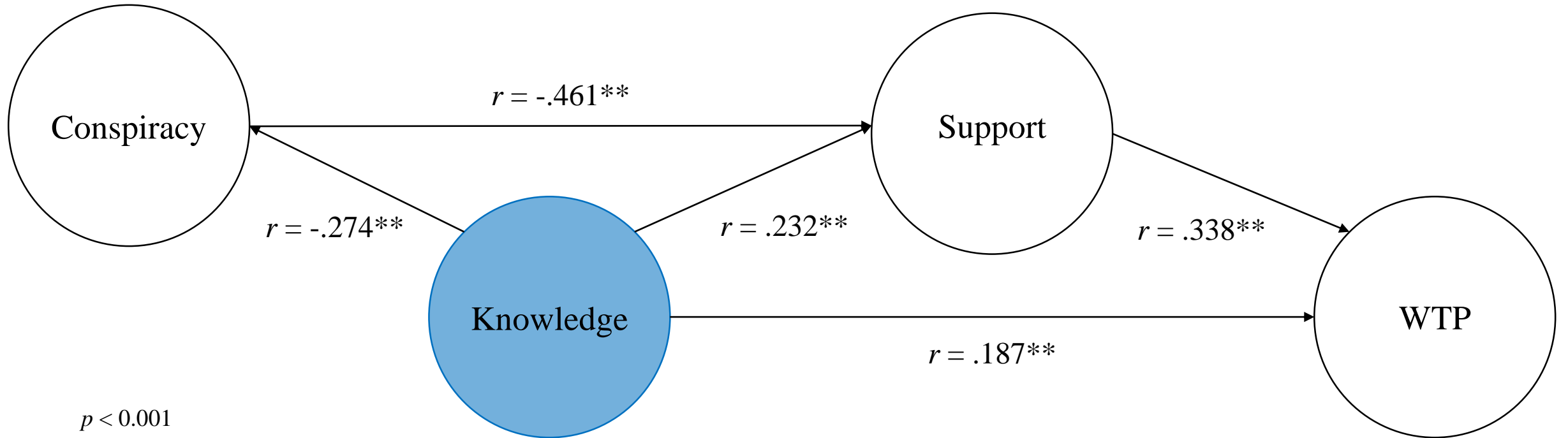
Support and WTP



Conspiracies, knowledge, support, & WTP



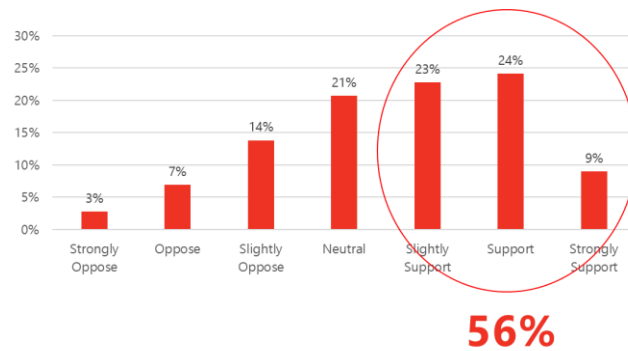
Conspiracies, knowledge, support, & WTP



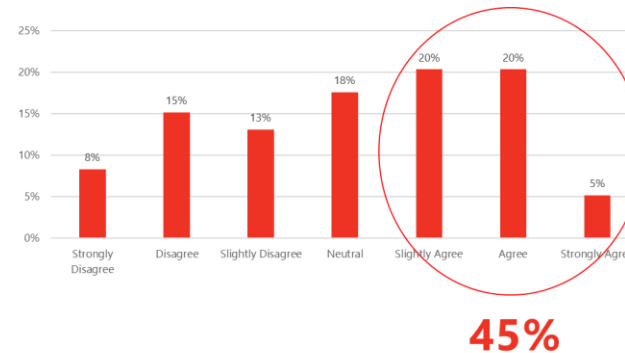
Canadian Nuclear Study (2022)

- Our study (Pennycook & Wilson, 2022) of 290 Canadians showed...

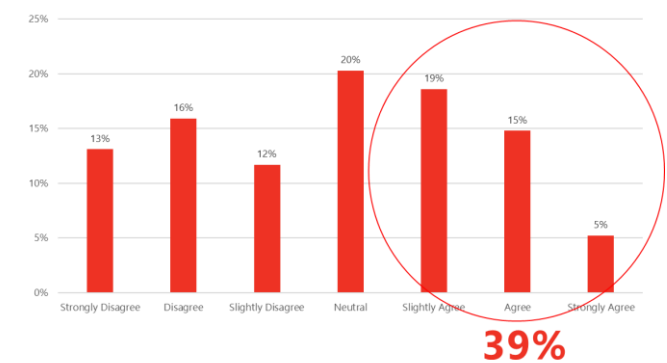
56% of Canadians support it as an energy source



45% of Canadians support it as the primary energy source



39% of Canadians support it as the energy source in their community

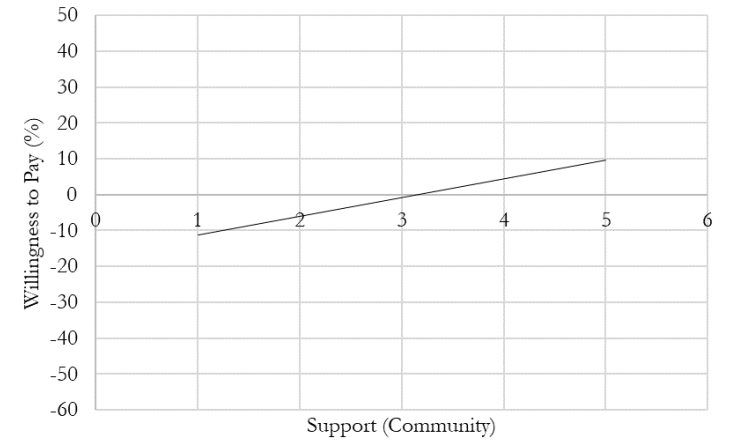
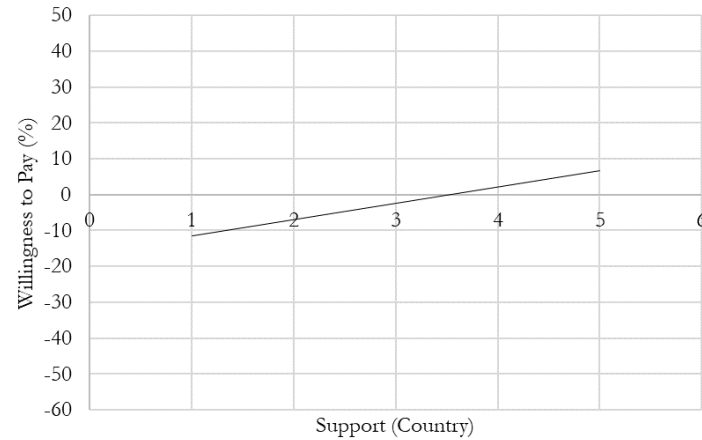
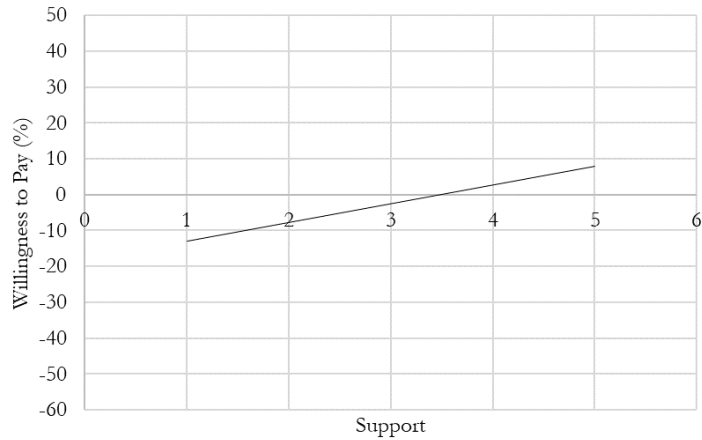


California Nuclear Study (2024)

- A representative U.S. study
- Experimental design based on advertisements
- Independent variables
 - Support for nuclear power generally
 - Support for nuclear power in country
 - Support for nuclear power in community
- Dependent variable
 - Willingness to pay
- Conditions
 - Advertisement from a private company (condition 1)
 - Advertisement from the government (condition 2)
 - Advertisement from the regulator (condition 3)
 - No advertisement (control)



Support and willingness to pay



General support, support in country, and support in community were all positively correlated with willingness to pay for nuclear power. Knowledge is an important driver of support – in general, domestically, and locally.



Advertisements

We are excited to announce the launch of the new **nuclear power plant** in your community to **power the future!**

Sponsored by your **private energy corporation and CEO**

We are excited to announce the launch of the new **nuclear power plant** in your community to **power the future!**

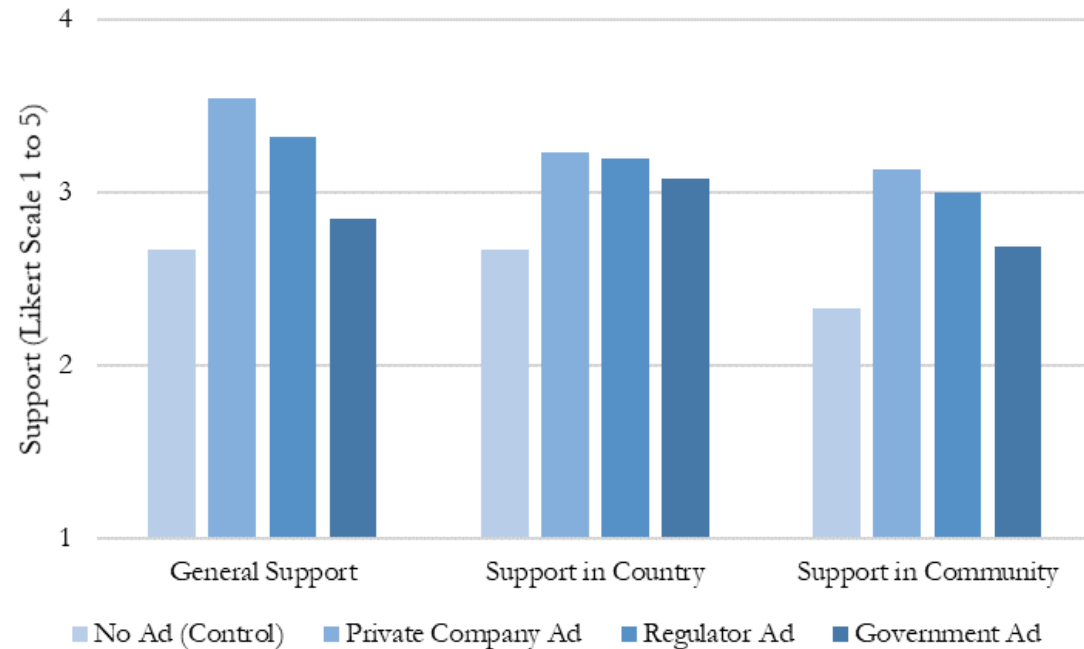
Sponsored by your **state government and governor**

We are excited to announce the launch of the new **nuclear power plant** in your community to **power the future!**

Sponsored by the **U.S. Nuclear Regulatory Commission**



Advertisements and support



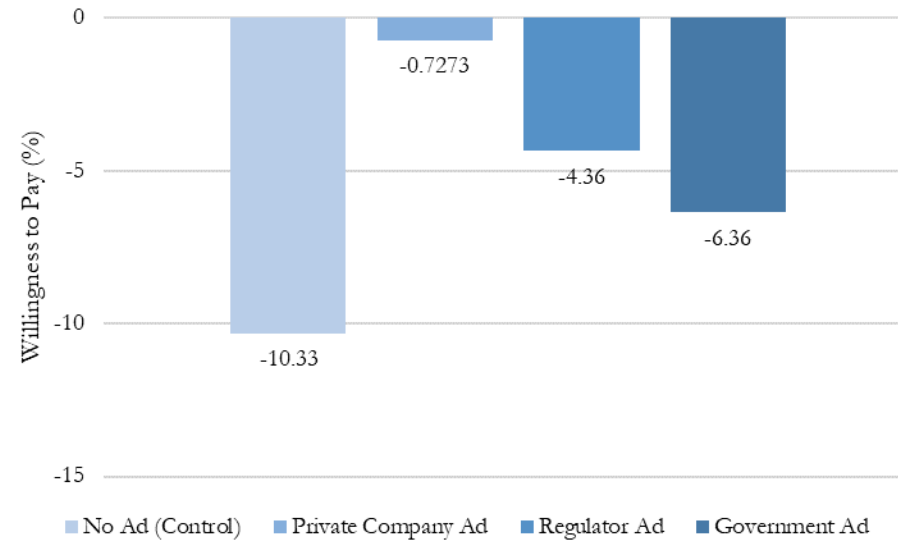
Individuals who viewed an advertisement – private company, regulator, or government – were more supportive of nuclear power, nuclear power in their country and community.

Support was higher among individuals who received advertisements from private companies versus regulators and the government.

Government advertisements were the least successful in generating support for nuclear power.



Advertisements and willingness to pay



All participants wanted to pay less for nuclear power as compared to other energy sources.

Advertisements reduced the discount demanded by participants, meaning advertisements increase the willingness to pay for nuclear power.

Advertisements from private companies increase the willingness to pay to a point of parity among other energy sources.

Government messages are the least effective in increasing willingness to pay for nuclear power.



Thank You!

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