Do Numerate People Understand Controversial Risks Better?

A Test of Knowledge of Power account of Climate Change Beliefs and Biases

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BIASED BELIEFS

- People have biased beliefs (e.g., inaccurate beliefs about the cause of global warming despite 97% expert consensus)
- Social and economic consequences (e.g., climate inaction expected to cost $2 trillion/year)

STATISTICAL NUMERACY & KNOWLEDGE

Statistical Numeracy

- Practical probabilistic reasoning skills
- One of the single strongest general predictors of superior decision making
- 3-minute measures (e.g., Berlin Numeracy Test)

Risk Literacy & Knowledge

- *Risk Literacy*: ability to evaluate and understand risk (RiskLiteracy.org)
- Numerate people are risk literate, and so acquire more accurate knowledge about risks, which is known to causally reduce biases.

NUMERACY VS. CONFLICTS OF INTEREST

- Some studies suggest that numeracy may not protect against or even worsen biases among people with conflicts of interests (e.g., political ideology, cultural worldview)
- Investigations have yet to explore numeracy-knowledge relationship.

Does numeracy protect against or promote biases in global warming beliefs?

METHODS

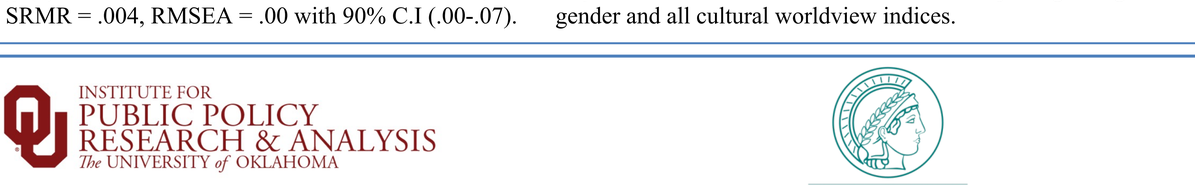
Study 1

- Probabilistically representative sample of adults in the U.S. (n = 305)
- The first test with five key variables: Numeracy, cultural worldview, knowledge, belief, risk perception

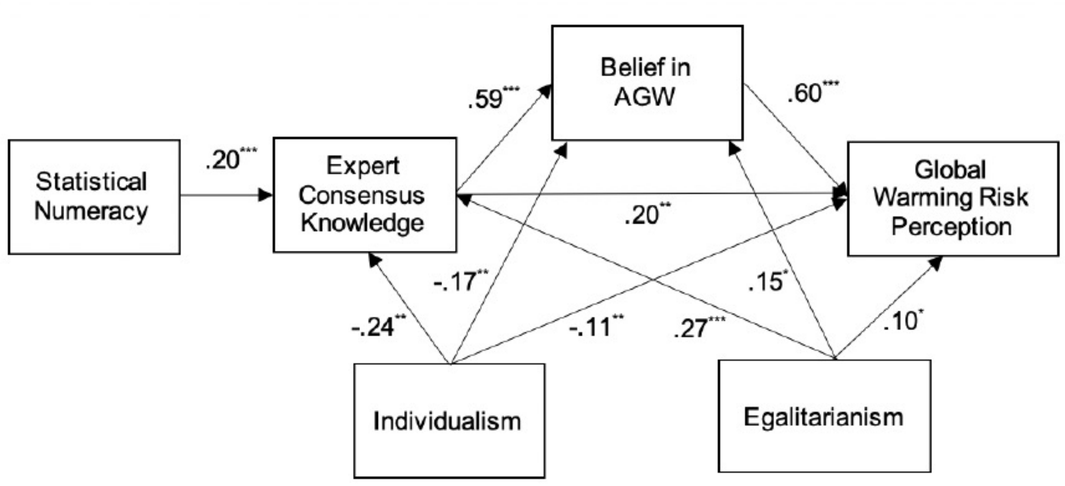
Study 2

- Convenience sample of adults in the U.S. from Mturk (n = 537)
- Out-of-sample validation
- Inclusion of general risk perception measure

Procedure



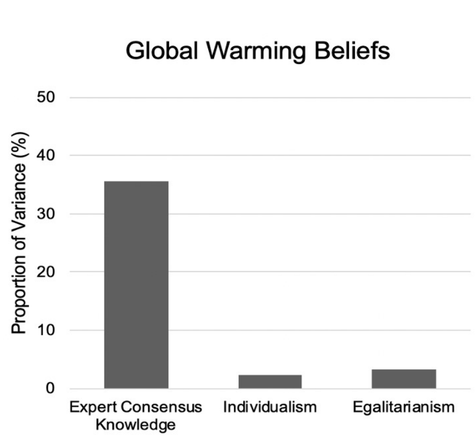
STUDY 1: STRUCTURAL EQUATION MODEL

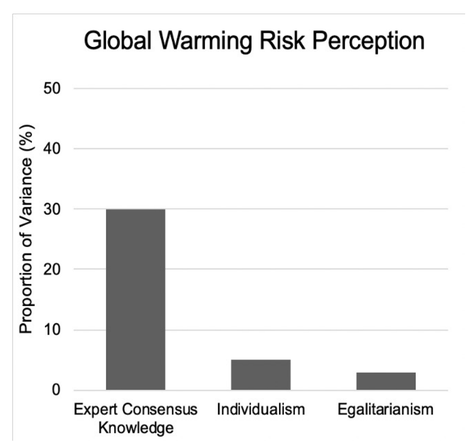


$\chi2(2) = 1.22$, $p = .54$, with CFI = 1.00, TLI = 1.00, SRMR = .004, RMSEA = .00 with 90% C.I (.00-.07).

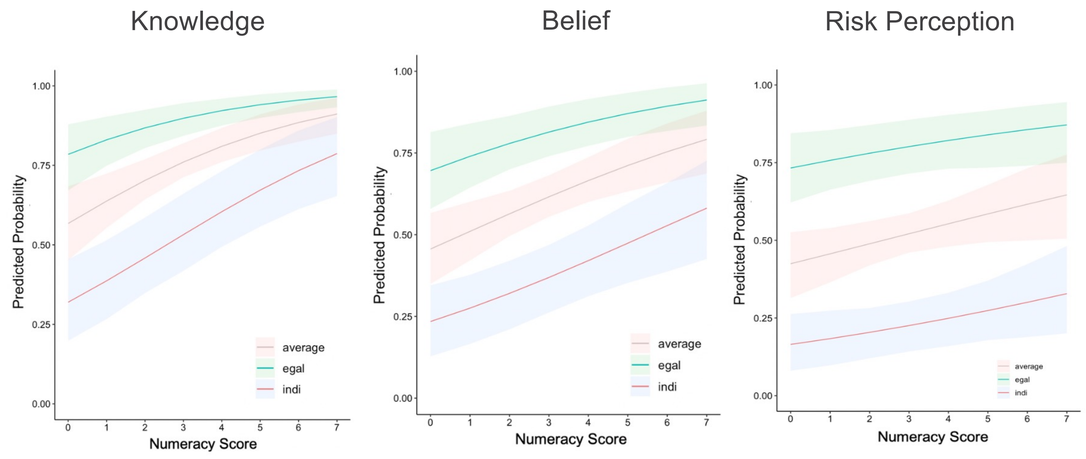
Reported are standardized coefficients after adjusting for age and gender and all cultural worldview indices.

STUDY 1: KNOWLEDGE IS POWER

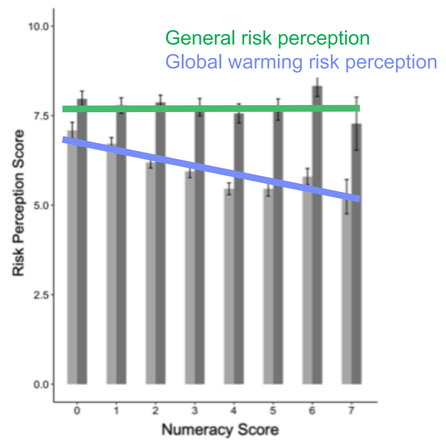




STUDY 1: PREDICTED PROBABILITIES



STUDY 2: RELATIVE RISK PERCEPTION



- More numerate people were *relatively* much more worried about global warming.
- Less numerate people reported that motor vehicles and alcohol, and other everyday risks were about as dangerous as global warming.

DISCUSSION

- Numerate and risk literate individuals tended to have acquire more accurate knowledge about risks.
- **Knowledge is Power:** Expert consensus knowledge was the strongest predictor of beliefs and risk perceptions.
- Risk literacy helps people become more informed and less biased reasoners, regardless of potential controversies and conflicts of interest.

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