

Cultural Identity Strongly Influences Data Interpretation



Motivated Numeracy and Enlightened Self-Government

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Why does public conflict over societal risks persist in the face of compelling and widely accessible scientific evidence?

Kahan, et al, conducted an experiment to probe two alternative answers:

1) the “Science Comprehension Thesis” (SCT), which identifies defects in the public’s knowledge and reasoning capacities as the source of such controversies; and

2) the “Identity-protective Cognition Thesis” (ICT), which treats cultural conflict as *disabling the faculties that members of the public use to make sense of decision- relevant science.*

The experiment presented subjects with a difficult problem that turned on their ability to draw valid causal inferences from empirical data

Please indicate whether the experiment shows that using the new cream is likely to make the skin condition better or worse.

	Result	
	Rash Got Better	Rash Got Worse
Patients who <u>did</u> use the new skin cream	223	75
Patients who did <u>not</u> use the new skin cream	107	21

What result does the study support?

- ☐ People who used the skin cream were more likely to get better than those who didn't.
- ☐ People who used the skin cream were more likely to get worse than those who didn't.

One group was shown a hypothetical experiment on a non-controversial topic – treating a rash with a new skin cream.

Another group was shown the same skin cream 'experiment' with the results switched

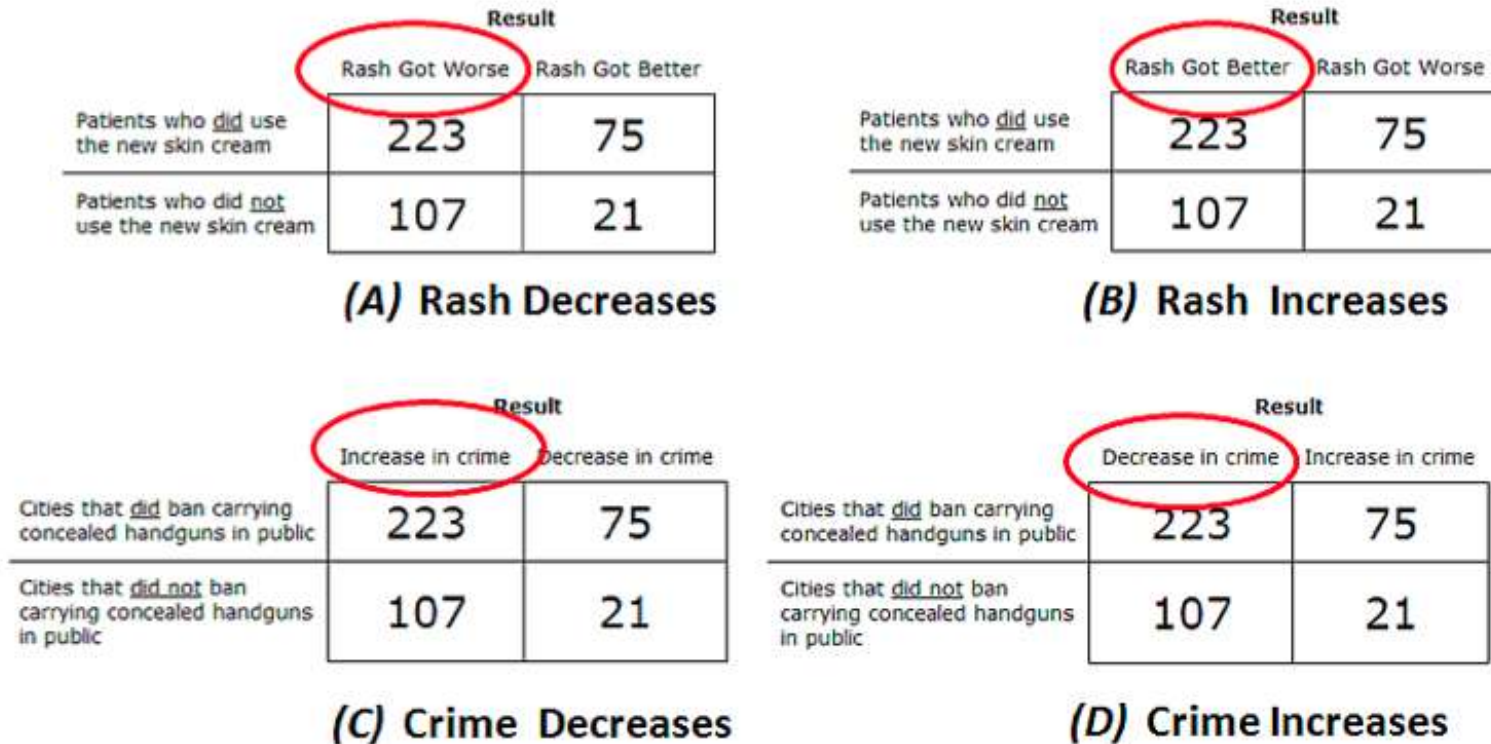
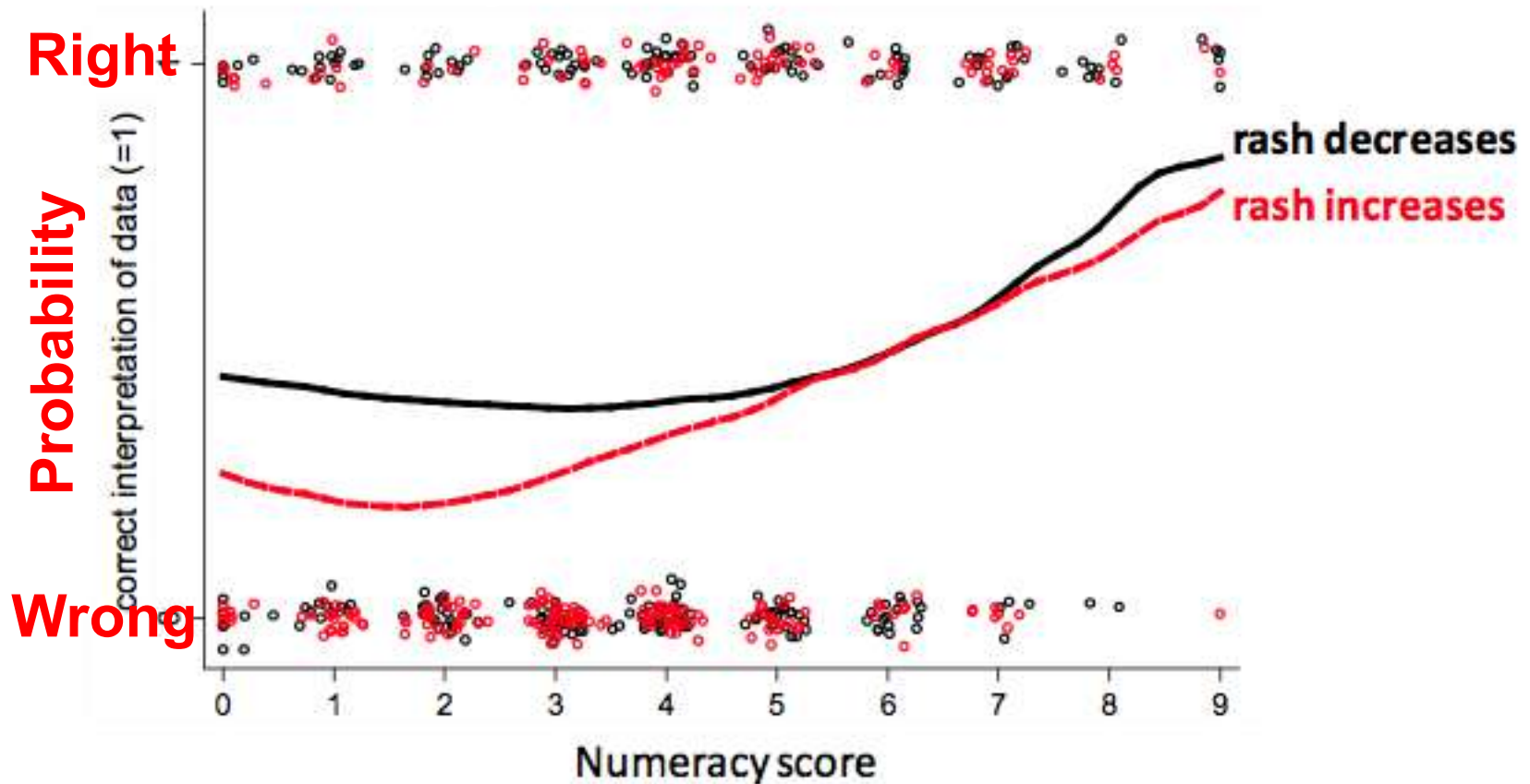


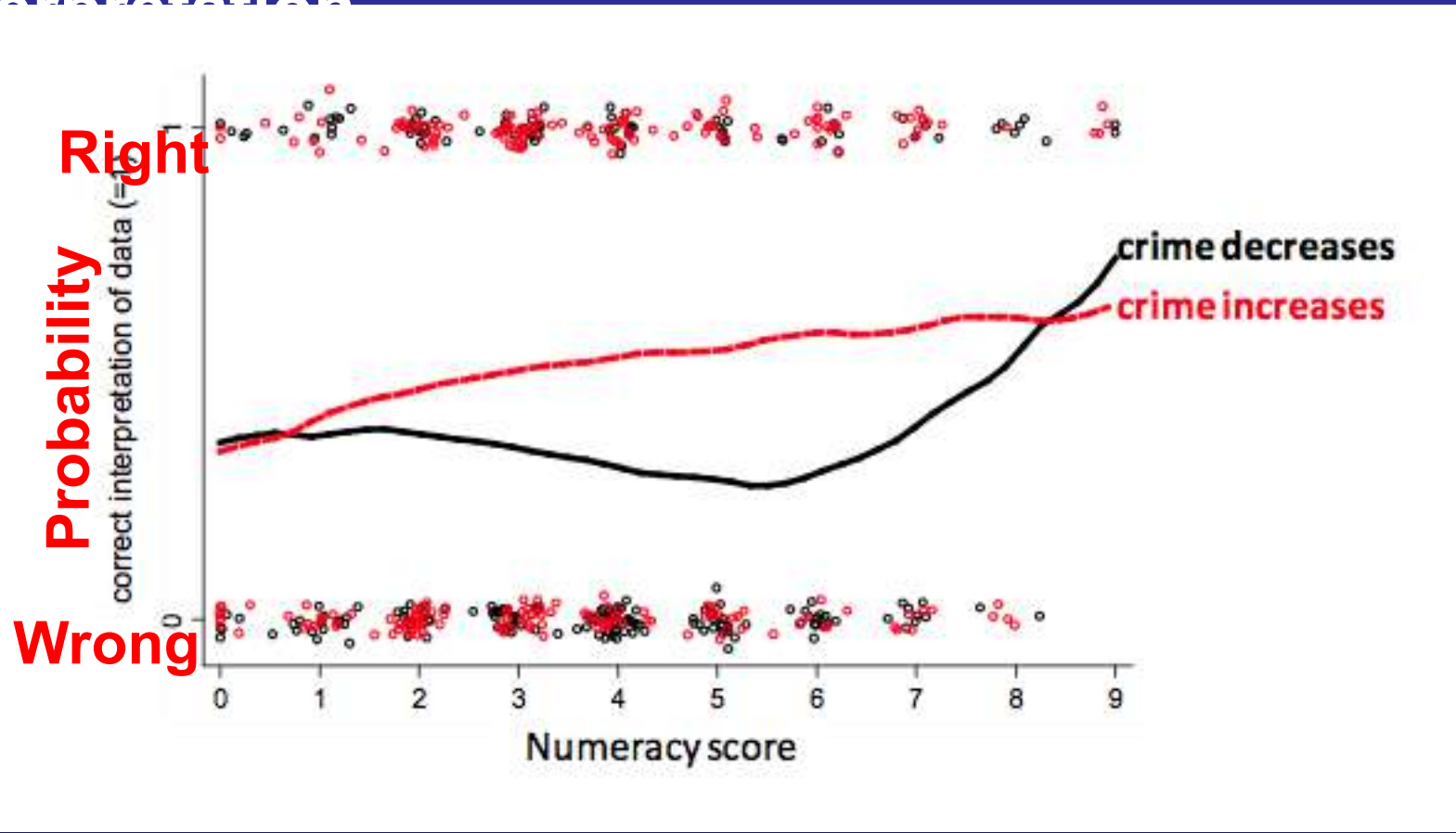
Figure 3. Experimental conditions. Subjects were assigned to one of four conditions. The conditions are identified by labels (A)-(D) in a manner that indicates the result or outcome of the experiment that is most supported by the data contained in the relevant table. The correct interpretation of the data was manipulated by varying the result specified by the headings above the columns.

Two other groups were shown the same data, but told the experiment was testing a gun control policy's effect on

When the topic was neutral (skin rash treatment), the probability a subject would make the correct interpretation increased with their numeracy.



However, when the topic was politically divisive (gun control), a subject's numeracy did not notably increase their chance of a correct interpretation



(except for the most numerate in the 'crime decreases' case)

Results sorted by subjects' political affiliation and numeracy – Controversy polarized the outcomes

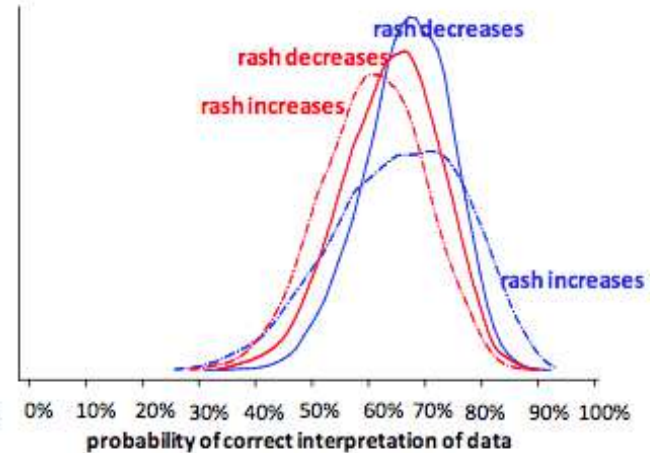
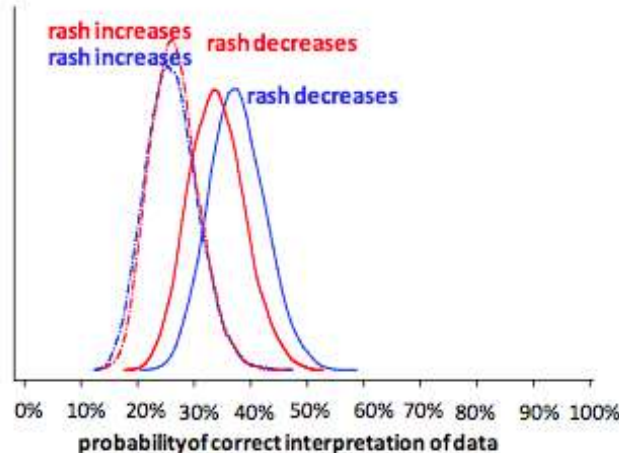
Liberal Democrat (-1 SD on Conservrepub) Conservative Republican (+1 SD on Conservrepub)

low numeracy = 3 correct/ high numeracy = 7 correct

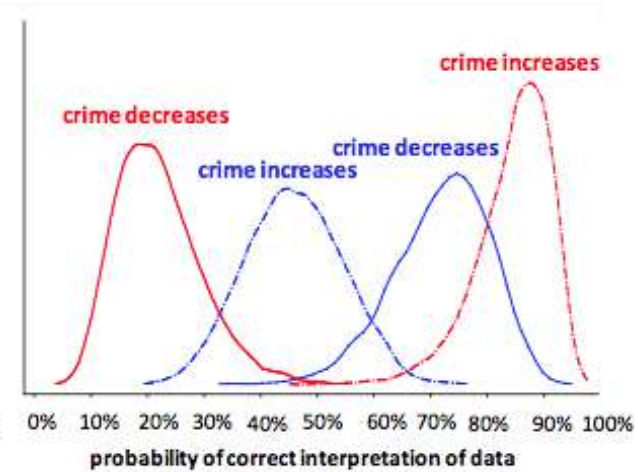
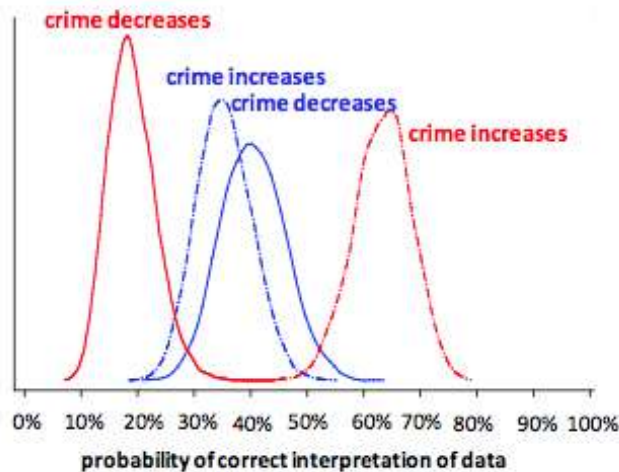
Low numeracy

High numeracy

Skin treatment

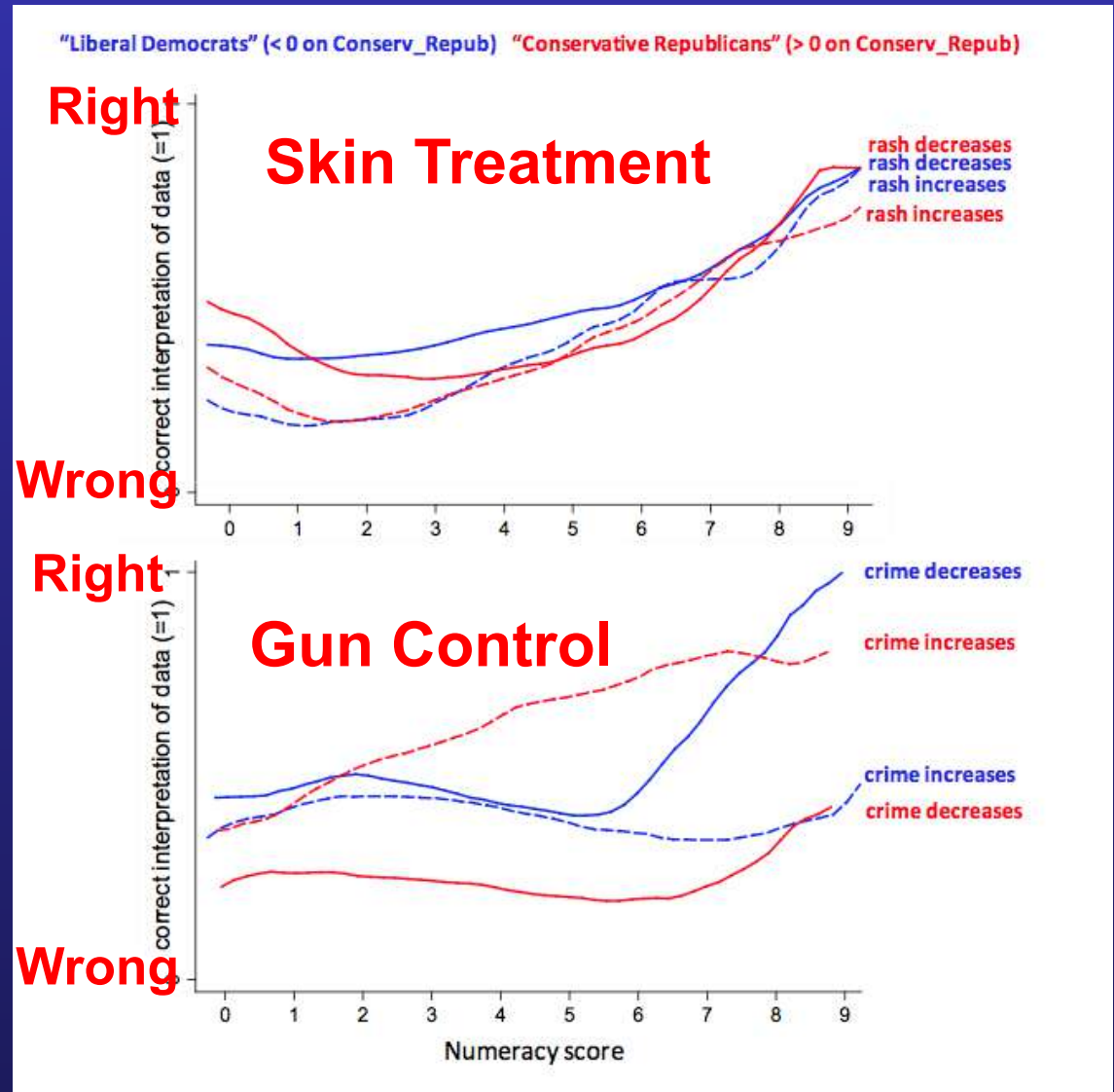


Gun ban



Results sorted by subjects' political affiliation

On the 'loaded' topic, numerate subjects only used their analytical ability when the easy first impression conflicted with their beliefs



Where reliance on low-effort heuristic reasoning suggested an inference that affirmed their political outlooks, high Numeracy partisans used that mode of information processing—even though it generated the wrong answer.

But where reliance on low-effort heuristic process suggested an inference that was threatening to their outlooks, high-Numeracy partisans used the ability that they (but not their low-Numeracy counterparts) possessed to make proper use of all the quantitative information presented in a manner that generated a *correct, identity-affirming conclusion*.

This selectivity of their use of their greater capacity to draw inferences from quantitative information is what generated greater polarization among high-Numeracy partisans than low-Numeracy ones.

It is perfectly rational, from an individual-welfare perspective, for individuals to engage decision-relevant science in a manner that promotes culturally or politically congenial beliefs.

Making a mistake about the best-available evidence on an issue like climate change, nuclear waste disposal, or gun control will not increase the risk an ordinary member of the public faces, while forming a belief at odds with the one that predominates on it within important affinity groups of which they are members could expose him or her to an array of highly unpleasant consequences.

(Kahan 2013)

DISCUSSION

**What are the
implications of this
study for teaching and
learning tactics?**