

## Complex influences of mechanistic knowledge, worldview, and quantitative reasoning on climate change discourse: Evidence for ideologically motivated reasoning among youth

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**Tweet.** *Climate science knowledge, worldview, and quantitative reasoning skills impact receptivity towards climate change.*

**AUDIENCE.** Curriculum developers; Informal educators; Formal educators

### KEY POINTS

- Climate change is a politically divisive topic in the United States.
- Understanding the science behind climate change increases likelihood of accepting ACC as an issue.
- More conservative worldviews decrease the likelihood of accepting ACC.
- Quantitative reasoning skills amplify the effect of worldview on ACC acceptance.
- Instruction should emphasize the science behind ACC in such a way that does not threaten the identities of students who may not accept ACC due to their worldviews.

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**INTRODUCTION.** Anthropogenic climate change (ACC) is a controversial topic in the United States. Many adults reject the consensus within the scientific community that climate change is being driven by human influence. Rejection or acceptance often aligns with political ideologies, with the more liberal beliefs accepting the scientific argument and those with more conservative beliefs often rejecting the idea that humans are to blame. Science classrooms provide opportunities for adolescents to learn about climate change and the complex interactions between the natural and human forces. While much research has been done in how to best approach this controversial topic, most research has not considered worldview, and those that have yielded unclear results. This study examined quantitative and qualitative data collected from 357 students across 5 geographically diverse high school populations. The study aims to determine how scientific knowledge, worldview, and quantitative reasoning skills (QR) influenced receptivity to the scientific consensus of human-driven climate change, and how worldview and quantitative reasoning manifests in their written arguments about climate change.

**FINDINGS.** Better scientific knowledge of the human contributions to climate change was associated with

an increased acceptance of humanities role in driving climate change across political ideologies. QR amplified the effect of worldview on ACC acceptance. As QR increased across students with liberal worldviews they became more likely to *accept* ACC while an increase in QR across students with conservative worldviews was associated an increase in the likelihood to *reject* ACC. Conservative worldviews when paired with high QR may lead to the acknowledgement of climate data, but the rejection of ACC as they would cite alternative explanations that aligned more closely with their worldviews.

**TAKEWAYS.** Learning experiences involving ACC should work to highlight the cause/effect relationship between human activity and climate change. The necessity of developing high QR levels in order to understand the science behind this argument can be a double-edged sword. It is important to consider the worldviews of students who are being taught to prevent the curriculum from backfiring. Instruction should be carefully designed to ensure that student identities are not threatened if accepting ACC is at odds with their belief system. Helping students understand why climate data better supports ACC than other explanations may help minimize the risk of this occurring.