



Cognitive biases in the perception of climate change

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A serious global problem

Global temperature has been rising consistently in the past few decades

1999-2008 Mean Temperatures

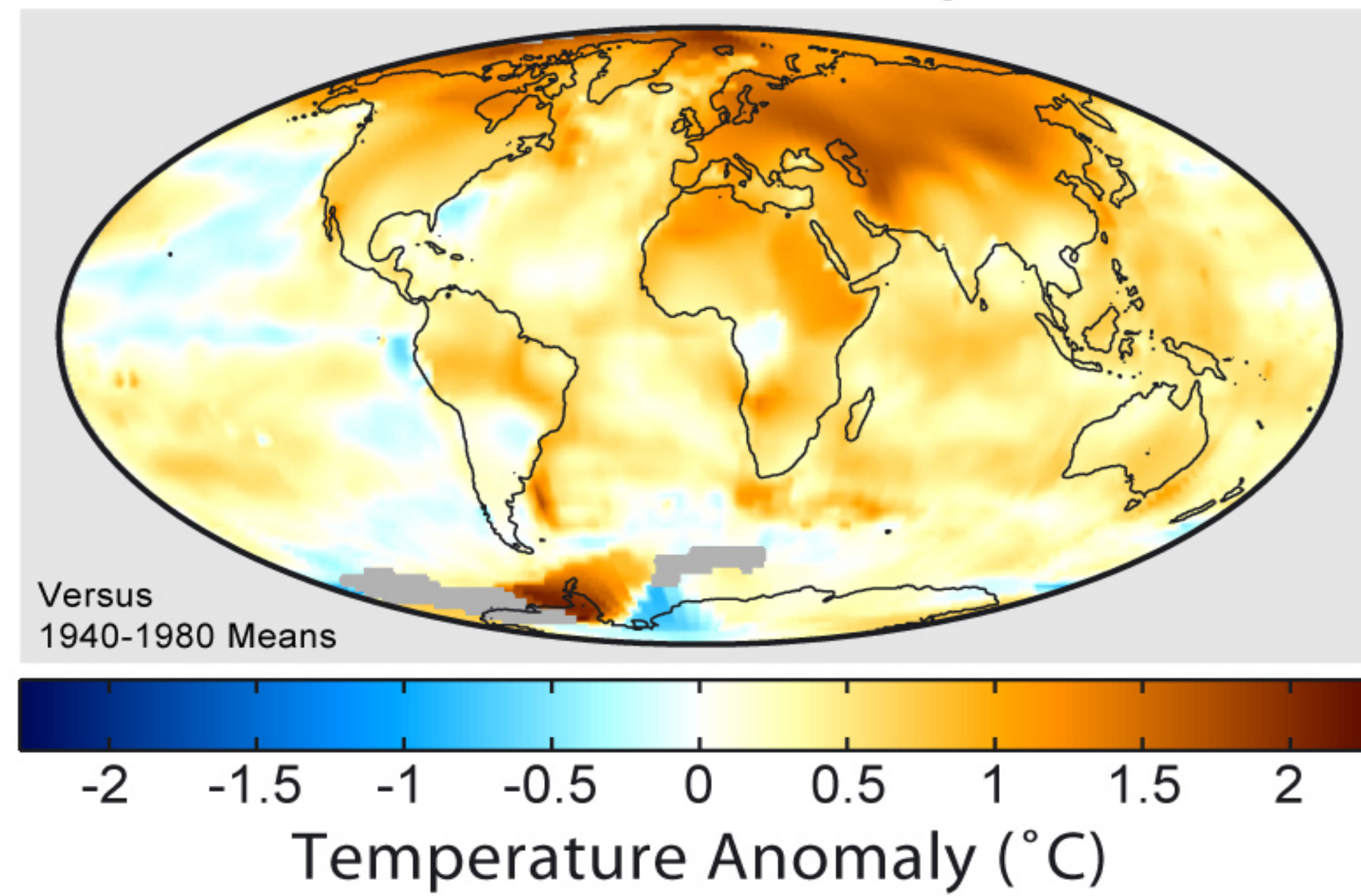
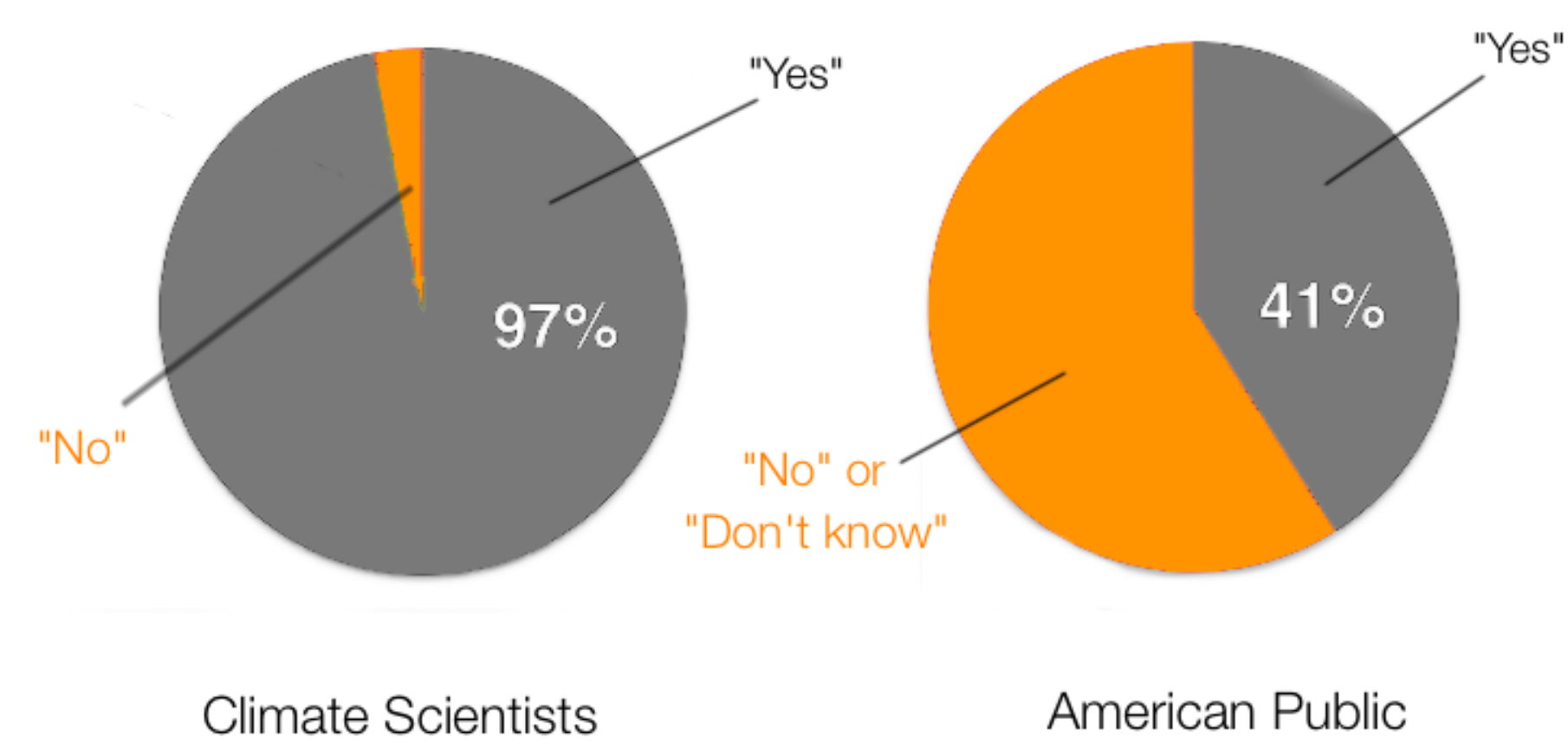


Figure: The difference in surface temperatures from January 1999 through December 2008. The average increase on this graph is 0.48 degrees Celsius (Hansen et al. 2001)

Scientific consensus vs. public opinion

Say Climate Change is Happening and Human Caused



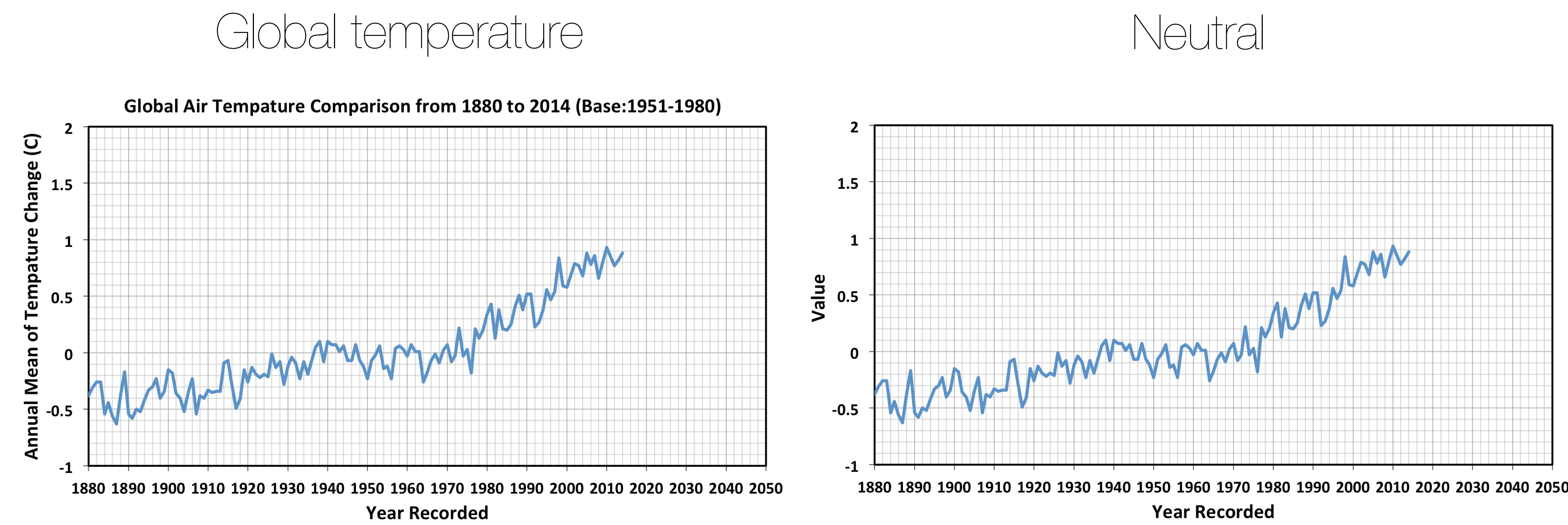
Left: Proportion of peer-reviewed research papers that stated a position on the reality of human-caused global warming and said that it is happening and human caused (Cook et al. 2013).

Right: Proportion of the American public that says climate change is happening and human caused (Leiserowitz et al. 2013).

Research question: Why do the public misperceive climate change?

Hypothesis: Personal motivations alter the interpretation of climate facts.

Global temperature presented under two different frames

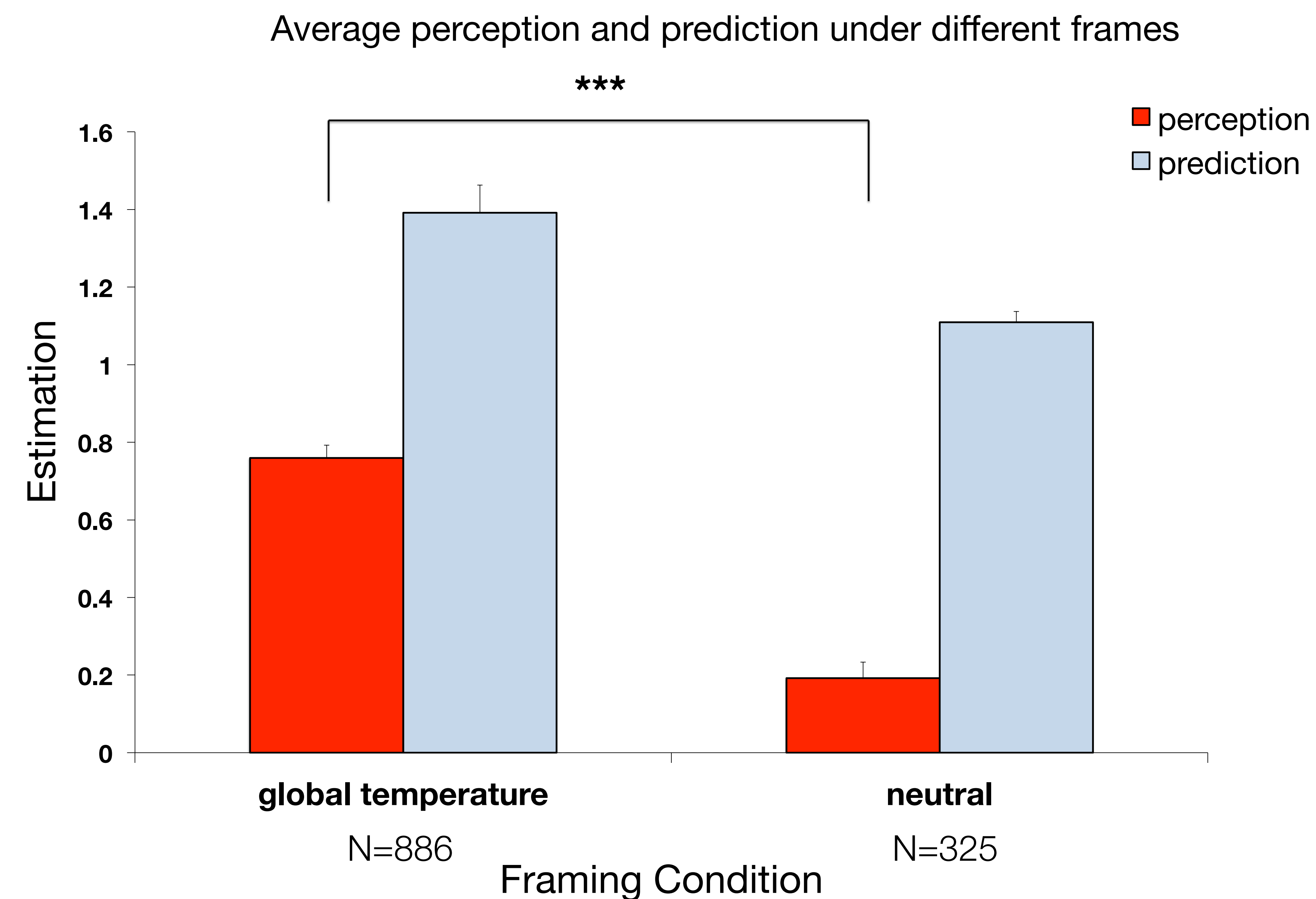


Perception: What is the average value from 1880 to 2014?

Prediction: What is the predicted average value from 2015 to 2050?

Political orientation is measured on a -5 to 5 scale (-5=liberal, 5=conservative)

Results: Over-estimation under the global temperature frame



Participants were recruited via Amazon Mechanical Turk

Results

People reliably over-estimated the perceived average value under the global temperature frame ($t(863)=11.18$, $p<.001$; $d=0.66$), but there was no difference in predicted values under the two frames.

Importantly, people's political orientation predicted the perception of the global temperature ($\beta=-0.04$, $t=-2.08$, $p<.01$).

Specifically, liberals perceived a higher global temperature than conservatives.

Discussion

People's interpretation of climate facts depends on the framing used and their political orientations.

Liberals heighten their perceptual sensitivity to global temperature, whereas conservatives mute their sensitivity to global temperature.

The cognitive bias may explain the political polarization on climate change.

Cook, J., Nuccitelli, D., Green, S., Richardson, M., Winkler, B., Painting, R., & Skuce, A. (2013). Quantifying the consensus on anthropogenic global warming in the scientific literature. *Environmental research Letters*, 8(2), 024024.

Hansen, J., Ruedy, R., Sato, M., Imhoff, M., Lawrence, W., Easterling, D., Peterson, T., & Karl, T. (2001). A closer look at United States and global surface temperature change. *Journal of Geophysical Research*, 106, 23947-23963.

Leiserowitz, A., Maibach E. W., Roser-Renouf, C., Smith, N., & Dawson, E. (2013). Climategate, Public Opinion, and the Loss of Trust. *American Behavioral Scientist*, 57(6), 818-837.