

Supplemental Appendices for:

**Priming Under Fire:
Reverse Causality and the Classic Media Priming Hypothesis**

Appendix A. Experimental Treatments

Participants in our study were randomly assigned to read one of the following news items, each adapted from stories that appeared in a national newspaper.

Environment Story

E.P.A. Says It Will Press on With Greenhouse Gas Regulation

The Environmental Protection Agency announced a timetable on Thursday for issuing rules limiting greenhouse gas emissions from power plants and oil refineries, signaling a resolve to press ahead on such regulation even as it faces stiffening opposition in Congress.

The agency said it would propose performance standards for new and refurbished power plants and oil refineries in the coming year. But the E.P.A. was vague on how stringent the rules would be and how deep a reduction in carbon dioxide emissions would result. Gina McCarthy, the assistant administrator for air and radiation, said the rules would be “cost-effective” but the agency declined to be more specific, saying only that the agency would consider the costs and benefits of available control technologies.

Power plants and refineries are the nation’s top emitters of carbon dioxide, a greenhouse gas that has been linked to global warming. Having declared greenhouse gases to be a threat to public health last year, the agency began regulating those emissions on Jan. 2 under the Clean Air Act.

The rules for new power plants and refineries are certain to be challenged by industry, some states, and many in the House of Representatives who have vowed to limit the agency’s regulatory powers.

On one level, the E.P.A. seemed to be flexing its muscle after drawing criticism from environmental groups for recently deciding to delay issuing standards on conventional pollutants from industrial boilers. But by isolating only power plants and refineries, the agency also seemed to signal that for now, at least, it will go after only big industrial sources.

Coal-fired power plants already face a cascade of new regulations scheduled to take effect in coming months covering their emissions of sulfur dioxide and nitrogen oxides, mercury and other pollutants. By putting utilities on notice that it is adding carbon dioxide to the pollutant list, the E.P.A. is increasing pressure on utilities to shut down older coal-fired plants.

Jeffrey R. Holmstead, who held Ms. McCarthy’s post under President George W. Bush, noted that the agency was “studious in avoiding” a definition of “cost-effective.”

"I think it's just their way of saying, what we intend to do will be reasonable," he said. The E.P.A., he said, has intermittently talked about reductions in carbon dioxide emissions that would pay for themselves because they resulted from improvements in energy efficiency, for example.

But unless the agency demands a fairly high expenditure on the kind of the technology that would be needed to avoid a ton of emissions, reductions will not be achieved, Mr. Holmstead said. "They're not going to have it both ways for much longer," he said.

Education Story

International test score data show U.S. firmly mid-pack

After a decade of intensive efforts to improve its schools, the United States posted these results in a new global survey of 15-year-old student achievement: average in reading, average in science and slightly below average in math. Those middling scores lagged significantly behind results from several countries in Europe and Asia in Tuesday's report from the Organization for Economic Cooperation and Development.

U.S. officials said the results show that the nation is slipping further behind its competitors despite years spent seeking to raise performance in reading and math through the 2002 No Child Left Behind law and a host of other reforms.

"For me, it's a massive wake-up call," Education Secretary Arne Duncan said Monday. "Have we ever been satisfied as Americans being average in anything? Is that our aspiration? Our goal should be absolutely to lead the world in education."

The Obama administration is likely to use the results to press Congress to rewrite the federal education law to prod states to do more to help the lowest-performing schools. On Monday, President Obama warned that the United States faces a "Sputnik moment," needing innovations akin to the effort to put a man on the moon after the Soviet Union launched the first satellite into orbit in 1957.

The report released Tuesday focused on reading ability and found that more than a dozen countries, from Korea to Poland, performed significantly better than the organization's statistical average in that area. The United States did not.

The U.S. scores of 500 in reading and 502 in science, on a 1,000-point scale, were about the organization's average, according to the report. The U.S. math score of 487 was below the average of 496.

Among the other key findings of the study:

-- Countries with similar levels of economic prosperity can yield widely varying academic results. Korea, the strongest performer among the group's member nations, has a lower gross domestic product per capita than the organization's average. So does Shanghai.

-- U.S. math results were up since 2006 but not measurably different than scores in 2003, the earliest year in which comparisons were possible. U.S. science scores were up since 2006, a bright spot in the results.

Control Story

Male pattern baldness: What causes it?

Why do so many men go bald? What exactly changes on their heads? Hot off the lab bench: Men go bald because the follicles from which their hairs sprout run out of special progenitor cells with which to make the hair.

Normally, inside hair follicles a region called “the bulge” contains a packet of adult stem cells from which the hair is replenished. Scientists have theorized that these stem cells might simply run out in those prone to male-pattern baldness.

To test this, a team of researchers at the University of Pennsylvania (and, it seems, a few other places) looked at hair follicles from discarded bits of scalp from 54 men seeking hair transplants. Comparing the follicles from still-hairy samples of these scalps with non-hairy samples, the researchers found:

- 1) The hair follicle stem cells were still there
- 2) Another set of cells — known as hair progenitor stem cells — were depleted.

The scientists concluded that somehow, for some reason, the stem cells don't transform into progenitor cells anymore. That makes male-pattern baldness similar to alopecia areata, a reversible kind of hair loss.

All well and good, but what does that mean for a person who has lost his hair and wants it back? Maybe nothing right now, but the scientists do note that the results suggest “potential reversibility of this condition.” And, they add, these and their other findings suggest the hair follicle is a fairly complicated place. The new info should help them develop therapies down the road for a range of hair and skin disorders.

Appendix B. 2SLS Estimates

Table B1: Unconfounded Test of the Priming Hypothesis Using 2SLS

Parameter	Estimates	Difference
Intercept, control arm (α_C)	-0.077 (0.020)	
Intercept, energy arm ($\alpha_{T,En}$)	-0.025 (0.024)	
Intercept, education arm ($\alpha_{T,Ed}$)	-0.037 (0.022)	
Pretreatment energy approval, control ($b_{C,En}$)	0.177 (0.263)	
Pretreatment energy approval, treatment ($b_{T,En}$)	0.344 (0.277)	
Priming effect, energy ($\theta_{En} = b_{T,En} - b_{C,En}$)		0.167 (0.084) p=0.023
Pretreatment education approval, control ($b_{C,Ed}$)	0.491 (0.246)	
Pretreatment education approval, treatment ($b_{T,Ed}$)	0.598 (0.249)	
Priming effect, education ($\theta_{Ed} = b_{T,Ed} - b_{C,Ed}$)		0.107 (0.082) p=0.097
Pretreatment approval (ρ)	0.350 (0.087)	
Observations	1,019	
R-squared	0.738	

Note: Estimates and standard errors (in parentheses) are from 2SLS regression on overall approval measured posttreatment. Difference statistics in the second column provide the basis of unconfounded tests of the priming hypothesis. In the leftmost column, parameters being estimated are in parentheses.

Table B2: Unconfounded Test of the Projection Hypothesis Using 2SLS, Environment

Parameters	Estimates	Difference
Intercept, control arm ($\gamma_{C,En}$)	-0.037 (0.014)	
Intercept, env. arm ($\gamma_{T,En}$)	-0.050 (0.020)	
Pretreatment overall approval, control ($\delta_{C,En}$)	0.706 (0.031)	
Pretreatment overall approval, treatment ($\delta_{T,En}$)	0.673 (0.042)	
Projection effect, env. ($\Delta_{En} = \delta_{T,En} - \delta_{C,En}$)		-0.033 (0.045) p=0.773
Pretreatment energy approval (φ_{En})	0.062 (0.015)	
Observations	1,066	
R-squared	0.607	

Note: Estimates and standard errors (in parentheses) are from 2SLS regression on energy approval measured posttreatment. Difference statistics in the second column provide the basis of unconfounded tests of the priming hypothesis. In the leftmost column, parameters being estimated are in parentheses.

Table B3: Unconfounded Test of the Projection Hypothesis Using 2SLS, Education

Parameters	Estimates	Difference
Intercept, control arm ($\gamma_{C,Ed}$)	-0.006 (0.015)	
Intercept, education arm ($\gamma_{T,Ed}$)	-0.044 (0.021)	
Pretreatment overall approval, control ($\delta_{C,Ed}$)	0.653 (0.033)	
Pretreatment overall approval, treatment ($\delta_{T,Ed}$)	0.639 (0.039)	
Projection effect, education ($\Delta_{Ed} = \delta_{T,Ed} - \delta_{C,Ed}$)		-0.014 (0.043) p=0.506
Pretreatment education approval (φ_{Ed})	0.074 (0.015)	
Observations	1,066	
R-squared	0.592	

Note: Estimates and standard errors (in parentheses) are from 2SLS regression on education approval measured posttreatment. Difference statistics in the second column provide the basis of unconfounded tests of the priming hypothesis. In the leftmost column, parameters being estimated are in parentheses.