On the Sources of Ordinary Science Intelligence and Ignorance

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& many x $10^3$ others

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The science communication problem

“How much risk do you believe global warming pose to human health, safety, or prosperity?”

$\text{\textit{Left_right}}$

$N = 1,769$. Nationally representative sample, April/May 2014 (YouGov). “Left_right” is continuous political outlook scale formed by aggregating responses to 7-point party identification item and 5-point “liberal-conservative” ideology item ($x=0.78$). CI’s reflect 0.95 level of confidence for estimated population mean.
The science communication problem

“How much risk do you believe private gun possession pose to human health, safety, or prosperity?”

Extremely high risk
High
Between moderate and high
Moderate
Between low and moderate
Low
Very low
None at all

Very liberal Strong Democrat Liberal Democrat Moderate Independent Conservative Republican Very Conservative Strong Republican

r = 0.55, p < 0.01

N = 1,885. Nationally representative sample, June 2013 (YouGov). Subjects “color coded” based on response to risk-perception outcome variable. X-axis reflects subjects’ Score on composite scale that aggregates responses to 7-point party identification item and 5-point “liberal-conservative” ideology item (α = 0.82).
The science communication problem

“How much risk do you believe fracking pose to human health, safety, or prosperity?”

N = 1,885. Nationally representative sample, June 2013 (YouGov). Subjects “color coded” based on response to risk-perception outcome variable. X-axis reflects subjects’ Score on composite scale that aggregates responses to 7-point party identification item and 5-point “liberal-conservative” ideology item (α = 0.82).
Policy matters

Political and News Media Factors Shaping Public Awareness of the HPV Vaccine

Sarah E. Gollust, PhD, Laura Attanasio, BA, Amanda Dempsey, MD, PhD, MPH, Allison M. Benson, BA, Erika Franklin Fowler, PhD

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Abstract

Background

In 2008, the U.S. Food and Drug Administration licensed a vaccine for the human papillomavirus (HPV) that prevents the strains of HPV that cause 70% of cervical cancers. Within months, many states introduced legislation requiring the vaccine for girls, prompting controversy and heightened political and media attention to the issue. Previous research has shown differences in HPV vaccine awareness by individual-level characteristics such as race/ethnicity, income, and education levels. We examined how individual political orientation and exposure to media coverage can also shape awareness of the vaccine.

Controversy Undermines Support For State Mandates On The Human Papillomavirus Vaccine

Sarah E. Gollust, Amanda F. Dempsey, Paula M. Lantz, Peter A. Ubel, and Erika Franklin Fowler

Abstract

State actions requiring adolescent girls to receive the human papillomavirus (HPV) vaccine created controversy following the vaccine's approval in 2006. Some health professionals worried that the controversy might dampen public support for those state policies and for other school immunizations in general. We fielded an experimental internet survey to determine how controversy affects attitudes about vaccines. We discovered that public support for the HPV vaccine wanes when the public is informed that the policies are controversial. However, the experimental survey also revealed that exposure to this policy controversy did not spill over and reduce public support for immunizations in general.
Who Fears the HPV Vaccine, Who Doesn’t, and Why?
An Experimental Study of the Mechanisms of Cultural Cognition

Dan M. Kahan · Donald Brannan · Geoffrey L. Cohen ·
John Gastil · Paul Slovic

Abstract  The cultural cognition thesis holds that individuals form risk perceptions that reflect their commitments to contested views of the good society. We conducted a study that used the dispute over mandatory HPV vaccination to test the cultural cognition thesis. Although public health officials have recommended that all girls aged 11 or 12 be vaccinated for HPV—a sexually transmitted virus that causes cervical cancer—political controversy has blocked adoption of mandatory school-enrollment vaccination programs in all but one state. An experimental study of a large sample of American adults (N = 1,538) found that cultural cognition generates disagreement about the risks and benefits of the vaccine through two mechanisms: biased assimilation, and the credibility heuristic. We discuss theoretical and practical implications.

Keywords  Cultural cognition · Risk perception ·
HIV · Biased assimilation · Source credibility

The advent of the human-papillomaviruses (HPV) vaccine was widely heralded as a “major public health breakthrough” (Kaufman, 2006, p. A1) that would “eventually save thousands of lives each year in the United States” (Harris, 2006, p. A1). Transmitted by sexual contact, HPV is the leading (likely the sole) cause of cervical cancer. It is estimated that as many as 45% of women in their early twenties have been infected by it (Dunne et al., 2007). Shortly after the FDA awarded “fast track” approval to the vaccine, the Center for Disease Control recommended that it be administered to all girls (no vaccine is currently approved for males) at age 11 or 12, before they are likely to have been exposed to the virus, at which point the vaccine becomes ineffective (Centers for Disease Control and Prevention, Office of Enterprise Communications [CDC], 2006). Public health advocates—financed conspicuously by Merck & Co., manufacturer of the vaccine—thereafter initiated a campaign to secure enactment of mandatory vaccination laws like those that require school children to be immunized against mumps, measles, rubella, and other childhood diseases (Saul & Pollack, 2007).

Nevertheless, the proposal for mandatory vaccination of schoolgirls has been mired in intense controversy. The vaccine admittedly fails to protect against 30% of the strains of HPV that cause cervical cancer, and critics question its reported effectiveness against the remainder. They also worry about the likelihood that vaccination will have unanticipated (or undisclosed) adverse side effects (Merck & Co., they point out, also manufactured Vioxx). Debate rages, too, over the possibility that vaccinated girls and young women, lulled into a false sense of security, will engage in greater amounts promiscuous and unprotected sex, thereby increasing their risk of pregnancy and other STDs (Alliance for Human Research Protection, 2007; Gibbs, 2006).
Cultural Cognition Worldviews

Hierarchy

Individualism  Communitarianism

Egalitarianism
Cultural Cognition Worldviews

Hierarchy

Hierarchy-individualism  Hierarchy-communitarianism

Individualism  Communitarianism

Egalitarian-individualism  Egalitarian-individualism

Egalitarianism
For HPV vaccination program. Studies show that nearly 50% of sexually active Americans now contract HPV, which is the leading cause of cervical cancer. Girls administered the vaccine will be protected from a variety of forms of HPV, which account for 70% of the cancers attributed to the virus. It is critical for vaccinations to be administered before the age at which girls are likely to become sexually active, because once they are exposed to HPV through sexual activity the vaccine won’t be effective. The Food and Drug Administration has certified the vaccine as safe for use. Because so few girls even know what HPV is, it is illogical to suggest that the vaccination will cause them to become more sexually active or to engage in unsafe sex. It is therefore clear that universal vaccination of girls against HPV will make a major positive contribution to public health in America.

Against HPV vaccination program. The rate of cervical cancer, a disease caused by HPV, is in fact extremely low: it accounts for less than 1% of all the cancer cases in the U.S. every year. Moreover, the vaccine offers no protection against types of HPV responsible for 30% of the cancers caused by the virus. Nevertheless, those who receive the vaccination are likely to assume it gives them complete protection. They are therefore more likely to engage in sexual activity, and to engage in sex without a condom, increasing their risk of contracting HPV and other sexually transmitted diseases, like HIV-AIDS, and of becoming pregnant. Finally, the HPV vaccine might well turn out to have unanticipated and dangerous side effects – just like many other medicines approved by the Food and Drug Administration. In sum, a universal HPV vaccine is likely to harm girls and women more than it helps.
Culturally identifiable “public health experts”

Hierarchy

Individualism

Communitarianism

Egalitarianism
Expert_x_argument congruence index

Hierarchist

Individualist

Communitarian

Egalitarian

Pro-Advocate

Subject

Con-Advocate

PA

CA
"The HPV vaccine is safe for use among young girls."

\[ N = 976. \text{ Monte carlo simulation based on logistic regression model.} \]
hpv controversy; polluted science communication environment
Karl Popper science communication anomalies . . .

“Mature popper”

Bernie Sanders . . .

“Young popper”

Arthur Lupia???????