



Risk in Perspective

Hazards in the News: Who Believes What?

Women and non-white professionals should be aggressively recruited into leadership roles at risk management institutions that have historically been dominated by white males.

Liza Green



John D. Graham, Ph.D.
Center Director

Liza Green



Kim M. Clemente
Research Assistant

Americans are bombarded by the mass media with information about new or emerging hazards to health and safety. In some cases, such as estrogen therapy causing breast cancer or electric and magnetic fields from large power lines causing childhood leukemia, there have been conflicting reports in the mass media over the veracity of hazard claims. However, citizens are aware that not every health claim made in the media is correct. Thus, an interesting question asks if the public has confidence that the hazards covered in the media are real or illusory.

This issue of RISK IN PERSPECTIVE explores public confidence in hazard claims based on a random digit-dial telephone survey of 1019 U.S. residents of the contiguous forty-eight states conducted November 10-12, 1995. Respondents were asked about their degree of confidence that eight specific items are "hazardous to people's health." On a scale from 0 to 10, where 0 indicates complete confidence that a hazard claim is not true, and 10 indicates complete confidence that a hazard claim is true, respondents reacted to the following items: radiation from medical x-rays, electric and magnetic fields from large power lines (EMFs), natural radon gas in homes and buildings, pesticide residues on food, ozone layer depletion by chemicals, global warming from carbon-dioxide pollution, dust and particles in city air, and environmental tobacco smoke (ETS) or second-hand smoke. The scale is designed to induce a response of 5 (or near 5) in cases where a respondent has no opinion or is very unsure about what they believe is true. To test if respondents understood the scale, two items were added:

"heavy smoking of cigarettes for twenty years" (a widely recognized hazard) and "listening to relaxing music" (an activity most would regard as completely safe). Note that the questions in the survey addressed only the respondents' degree of confidence in the existence of a hazard (a qualitative issue), and did not address personal vulnerability to hazards or qualitative aspects of risk assessment (i.e., the probability and/or severity of the hazard to specific populations).

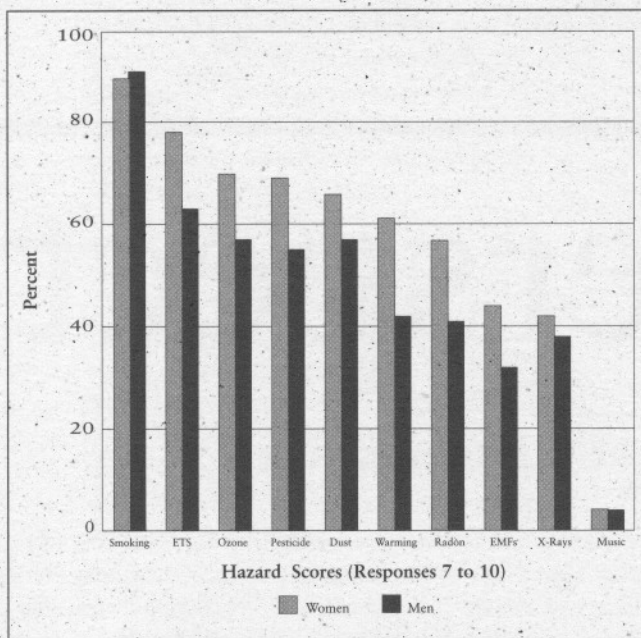
Not All Hazards are Created Equal

The overall results of the survey are summarized in Figure 1, which reports the percentage of respondents (male versus female) that assigned a score of 7 or higher to each of the eight hazard items. People clearly drew distinctions in their degree of confidence about specific hazard claims. As expected, respondents saw heavy smoking, and relaxing music as endpoints on the 11-point scale. Greater confidence was expressed in ETS, ozone depletion, pesticide residues, and dust and particles in city air than was expressed in EMFs. Interestingly, there was not a large difference in the hazard-confidence scores expressed for EMFs (a form of non-ionizing radiation) and radiation from medical x-rays and natural radon gas in homes and buildings (both forms of ionizing radiation).

We thought it would be interesting to see if scientists would have similar hazard-confidence scores to the general public on all ten hazard items. We have undertaken a parallel survey of scientists in various fields. Results from the survey should be available in 1997.

Figure 1

Percentage of Respondents Who Believe Item to be Hazardous



Hazard "Believers" versus "Skeptics"

We identified the respondents who are most likely and least likely to have confidence that all eight items (excluding smoking and relaxing music) are hazardous to people's health

and safety. A mean-hazard score for each respondent was computed by averaging the confidence scores for the eight hazard items. The group of respondents in the top quartile (mean scores ≥ 8) were designated as hazard "believers," and those respondents in the lowest quartile (mean scores ≤ 5.4) were designated as hazard "skeptics." Interestingly, the profiles of these two groups of respondents are quite different (Table 1).

The "skeptics" are disproportionately white, male, highly educated, have an annual household income greater than \$40,000, and have some factual knowledge of comparative injury and disease risks (correct answers to questions about relative frequency of diseases and traumatic injury). In contrast, the "believers" tend to be female, have an egalitarian world view, live in the northeast, have children in the household under the age of eighteen, and often receive health and safety

Table 1.

Comparison of Hazard "Skeptics" and "Believers": Average Hazard Score^a

Characteristic	Sample Profile %	Hazard "Believers" %	Hazard "Skeptics" %
White	86.7	82.6	93.1***
Male	49.7	30.9	68.9***
Children in Household	38.3	44.1	33.6*
Region: Northeast	21.3	26.4	14.9**
Region: Midwest	25.2	21.7	26.5
Region: South	34.4	34.9	38.1
Region: West	19.0	17.1	20.5
Income > \$40,000	40.5	34.2	49.0***
< High School Education	10.2	15.2	6.8**
High School Education	35.9	37.1	33.5
> High School Education	53.9	47.7	59.8**
Egalitarian World View	84.4	92.2	70.9***
Receive info often from Popular Media	62.9	68.6	53.4***
Receive info often from Doctor	35.0	39.5	30.2*
Receive info often from Scientific Journals	22.5	25.7	21.3
Injury Question: Correct	62.7	50.8	75.4***
Disease Question: Correct	57.6	46.1	63.8***

^a t-test of H_0 : Believers' mean confidence score = Skeptics' mean confidence score

* $p < .05$

** $p < .01$

*** $p < .001$

information from the media and doctors. Of course, these two categories are very crude and there are many respondents (as indicated in Table 1) who do not fit into this simplistic dichotomy.

The Gender Gap

Gender is a remarkably strong predictor of confidence in health hazards. Sixty-nine percent of the "believers" are women, while only 31 percent of the "skeptics" are women (Table 1). This powerful association of gender with hazard confidence is consistent with findings of other research on risk perception. One such study asked respondents to rate twenty-five public-health risks, where women rated all the items as more risky than men. In another study, women tended to feel more insecure about risks, and found risks less acceptable than men when asked about living near polluted soil, a chemical plant, or a radioactive-waste storage site.

Theories Abound

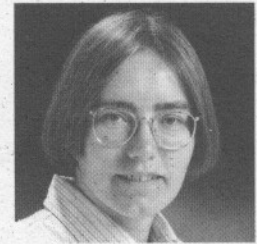
Although attempts have been made to explain these significant gender differences, researchers have yet to come to any firm conclusions. Some suggest that because women give birth, protect, and care for their children, they may naturally tend to be more nurturing than men; therefore they may be more concerned about hazards that may harm their families. Other researchers believe that women may feel less inhibited than men in expressing feelings of vulnerability and fear. In contrast, men may be socially taught that fear is a sign of weakness, and any feelings of fear or insecurity (e.g., hazard perceptions) should be minimized. Other theories suggest that women find involuntary hazards to be more believable since they are more vulnerable to violence than men.

Another possible explanation is that women are less familiar with science and technology than men, and are generally more fearful of it, especially in relation to nuclear power and chemicals. Some theories suggest that women tend to con-

tribute less, and may directly benefit less from technology than men. This means that women may not understand, or may not perceive benefits to society from potentially hazardous technologies, so they are more fearful and wary of these technologies.

A related theory based on worldviews is that people tend to use these views to maintain their beliefs and moral systems. People with egalitarian worldviews tend to be distrustful of people in positions of authority, and want more equal shares of resources in society. Therefore they may see environmental risks as unacceptable, especially if the risks have an uneven impact on different members of society, or if the risks are imposed without the affected parties' consent.

While our study does not allow us to come to any concrete conclusions on this matter, it appears that the role of gender in risk perception is more profound than can be explained by either the "nurturing" or "worldview" hypotheses. We did find that respondents (male and female) with children at home were more likely to believe in hazards (Table 1). We also found that women were more likely than men to have children at home, and were more likely to hold egalitarian worldviews. However, in a multivariate analysis (not reported here) gender remains a significant predictor of



Roberta Glass
Research Assistant



Nicole Pasternak, M.S.
Research Assistant

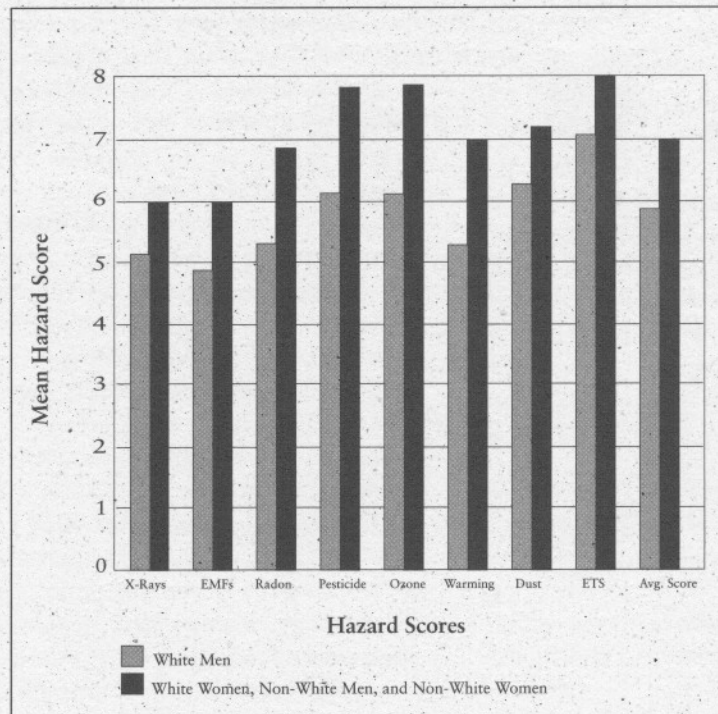


Figure 2
Mean Hazard
Scores by
Race and
Gender

Lisa Green

Tom Rinaldi

information from the media and doctors. Of course, these two categories are very crude and there are many respondents (as indicated in Table 1) who do not fit into this simplistic dichotomy.

The Gender Gap

Gender is a remarkably strong predictor of confidence in health hazards. Sixty-nine percent of the "believers" are women, while only 31 percent of the "skeptics" are women (Table 1). This powerful association of gender with hazard confidence is consistent with findings of other research on risk perception. One such study asked respondents to rate twenty-five public-health risks, where women rated all the items as more risky than men. In another study, women tended to feel more insecure about risks, and found risks less acceptable than men when asked about living near polluted soil, a chemical plant, or a radioactive-waste storage site.

Theories Abound

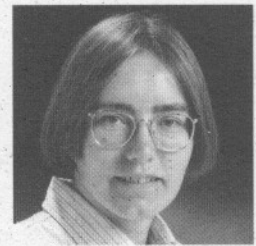
Although attempts have been made to explain these significant gender differences, researchers have yet to come to any firm conclusions. Some suggest that because women give birth, protect, and care for their children, they may naturally tend to be more nurturing than men; therefore they may be more concerned about hazards that may harm their families. Other researchers believe that women may feel less inhibited than men in expressing feelings of vulnerability and fear. In contrast, men may be socially taught that fear is a sign of weakness, and any feelings of fear or insecurity (e.g., hazard perceptions) should be minimized. Other theories suggest that women find involuntary hazards to be more believable since they are more vulnerable to violence than men.

Another possible explanation is that women are less familiar with science and technology than men, and are generally more fearful of it, especially in relation to nuclear power and chemicals. Some theories suggest that women tend to con-

tribute less, and may directly benefit less from technology than men. This means that women may not understand, or may not perceive benefits to society from potentially hazardous technologies, so they are more fearful and wary of these technologies.

A related theory based on worldviews is that people tend to use these views to maintain their beliefs and moral systems. People with egalitarian worldviews tend to be distrustful of people in positions of authority, and want more equal shares of resources in society. Therefore they may see environmental risks as unacceptable, especially if the risks have an uneven impact on different members of society, or if the risks are imposed without the affected parties' consent.

While our study does not allow us to come to any concrete conclusions on this matter, it appears that the role of gender in risk perception is more profound than can be explained by either the "nurturing" or "worldview" hypotheses. We did find that respondents (male and female) with children at home were more likely to believe in hazards (Table 1). We also found that women were more likely than men to have children at home, and were more likely to hold egalitarian worldviews. However, in a multivariate analysis (not reported here) gender remains a significant predictor of



Roberta Glass
Research Assistant



Nicole Pasternak, M.S.
Research Assistant

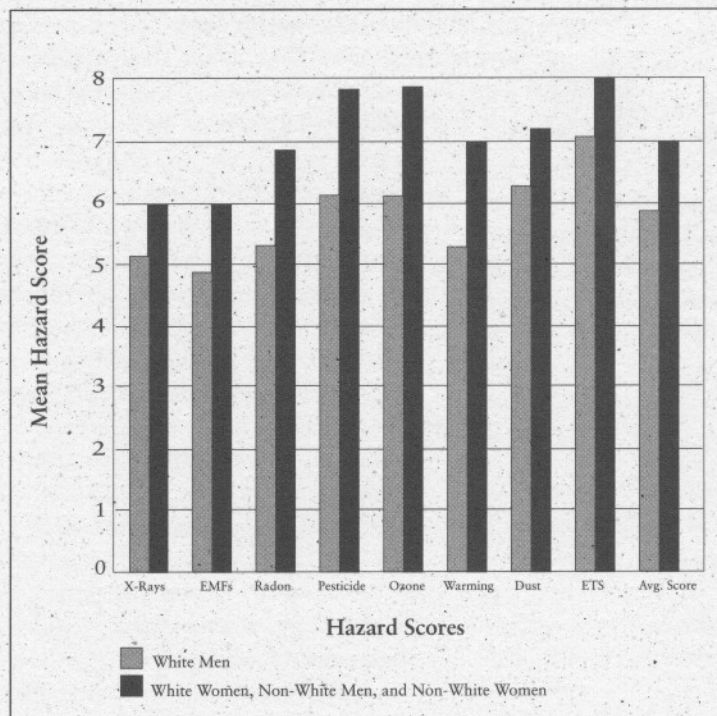


Figure 2
Mean Hazard
Scores by
Race and
Gender

confidence in hazards, even after controlling for the presence of children in the home and the worldview of the respondent. More research is needed to understand why gender plays such a powerful role in perception of hazards.

White Males versus Everyone Else?

The interaction between race and gender also significantly influences hazard-confidence scores. Figure 2 compares the mean hazard-confidence scores of white men, to white women, non-white men, and non-white women. The mean hazard-confidence score for white men is significantly different from all other groups. In addition, there are no significant differences between white women, non-white men, and non-white women. This same pattern holds for each of the hazards individually (except in the case of dust and particles, where white and non-white women differ significantly). The difference in risk perceptions between white men and everyone else has also been found by other researchers.

Since there is no discernible difference in the hazard perceptions of non-white men and non-white women, new questions arise in finding an explanation for the unique perceptions of white men. A biological explanation for gender differences seems (at best) incomplete because, if true, the differences between non-white men and non-white women would be similar to those between white men and white women. To explain the unique viewpoints of white men, socioeconomic and sociopolitical theories

have been posited. White men are overwhelmingly the largest group of people in positions of power, often with first-hand experience and knowledge of potentially hazardous industrial technologies. Their acceptance of risky technologies may also be a result of the benefits they derive from these technologies (though one wonders whether women and non-whites might have similar viewpoints if they had the same power, experience, access to knowledge, and benefit from technologies). More research needs to be conducted on whether, and, if so, how the positions of power, knowledge, and privilege now held by white males in society breed skepticism about hazard claims.

Practical Import

In our opinion, the apparent roles of gender and race in hazard perception suggest some very practical steps that government and industry can take to enhance the deliberative qualities of risk management and communication. Risk-related institutions run predominantly by white males may be too insular in perspective to fully appreciate how the public will react to hazard claims heard in the media. Women and non-white professionals should be aggressively recruited into leadership roles at risk management institutions that have historically been dominated by white males. Although this same conclusion might be advocated on pure equity grounds, we believe that the responsiveness of future risk management may be a useful supplementary argument for those who are not fully persuaded on the basis of equity alone.

Harvard Center for Risk Analysis
Harvard School of Public Health
718 Huntington Avenue
Boston, Massachusetts 02115

617 432-4497



100% recycled paper,
all post-consumer fiber.

FURTHER READING:

J. Flynn, P. Slovic, and C.K. Mertz. "Gender, Race, and Perception of Environmental Health Risks." *Risk Analysis*. 1994 14 (6):1101-08.

J.M. Gutteling and O. Wiegman. "Gender-Specific Reactions to Environmental Hazards in the Netherlands." *Sex Roles*. 1993 28 (7/8):433-46.

E. Peters and P. Slovic. "The Role of Affect and Worldviews as Orienting Dispositions in the Perception and Acceptance of Nuclear Power." *Journal of Applied Social Psychology*. 1996 26:1427-53.

PEER REVIEWERS:

James K. Hammitt, Ph.D.

Lorenz Rhomberg, Ph.D.

For more information on the survey, contact the Harvard Center for Risk Analysis by mail at 718 Huntington Avenue, Boston, MA 02115, or phone at (617) 432-4497.