



Gender, race, and perceived risk: the 'white male' effect

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Abstract *Risks tend to be judged lower by men than by women and by white people than by people of colour. Prior research by Flynn, Slovic and Mertz [Risk Analysis, 14, pp. 1101–1108] found that these race and gender differences in risk perception in the United States were primarily due to 30% of the white male population who judge risks to be extremely low. The specificity of this finding suggests an explanation in terms of sociopolitical factors rather than biological factors. The study reported here presents new data from a recent national survey conducted in the United States. Although white males again stood apart with respect to their judgements of risk and their attitudes concerning worldviews, trust, and risk-related stigma, the results showed that the distinction between white males and others is more complex than originally thought. Further investigation of sociopolitical factors in risk judgements is recommended to clarify gender and racial differences.*

Key words: risk perception, gender, race, trust, white male effect

Introduction

Risks tend to be judged as lower by men than by women (see, for example, Brody, 1984; Steger and Witt, 1989; Gwartzney-Gibbs and Lach, 1991; Gutteling and Wiegman, 1993; Stern *et al.*, 1993; Flynn *et al.*, 1994). However, progress has been slow in explaining gender differences in perceived risk, and few studies have examined how differences are related to other characteristics of individuals, such as race. Flynn *et al.* (1994) suggest that the role of gender or race in perceived risk may relate to sociopolitical factors. The main aim of the present paper is to examine how gender and race are related to a range of sociopolitical factors thought to influence risk perceptions. The study reported here was designed to oversample minority populations and address a range of sociopolitical issues. Data suggest that general attitudes toward the world and its social organization (which we shall refer to as worldviews and trust) and stigma are different for white males compared with other groups and that this effect is more complex than previously indicated by Flynn *et al.* We also note that gender and race are politically sensitive issues, and raising them in public discussions about risks (where there is often much at stake) can be emotionally intense and difficult. Therefore, a second aim of this paper is to provide data about how people of different genders and races perceive risks.

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Traditionally, one explanation for differences in risk perceptions is based on an assumption of differences in rationality and education. According to the 'irrationality' perspective, risk perceptions that deviate from estimates of fatality rates or other 'objective' indices are thought to arise from a lack of understanding of complex scientific and technical information (see Cohen, 1983; Cross, 1998). Some risk regulators and health risk communicators seem to believe that arming people with more information should reduce their scientific illiteracy and improve their decision making. That is, risk perceptions would be more accurate if people used more complete information about product or technology attributes (Bettman *et al.*, 1987). Others seem to believe that if people just listened to the facts, they would reach the same conclusions as experts (Wandersman and Hallman, 1993). However, extensive efforts to educate the public about risks and risk assessment, such as advertisement campaigns for nuclear power, have failed to move public opinion to coincide with the experts. When measured by expert views, the public overestimates some risks and underestimates others (Adler and Pittle, 1984; see also Svenson *et al.*, 1985). Furthermore, addressing risk controversies with technical solutions may contribute to conflict (Kunreuther and Slovic, 1996).

Research on gender differences suggests that discrepancies in risk perceptions of men and women may not reflect differences in rationality or education (Gardner and Gould, 1989). For instance, Barke *et al.* (1997) showed risk perception differences between men and women scientists. Thus, men and women with considerable technical understanding of risk and knowledge of risk assessment procedures still differ in their risk perceptions. Similar data were reported by Slovic *et al.* (1997), who found that among members of the British Toxicology Society, females were far more likely than males to judge societal risks as moderate or high (see also Kraus *et al.*, 1992; Slovic *et al.*, 1995). Furthermore, biased risk judgements have been demonstrated within expert populations, suggesting even the most highly educated are influenced by the specific context of risk estimation questions. For example, McNeil *et al.* (1982) showed that framing outcomes in terms of the probability of survival rather than the probability of death affected physicians' preferences for different lung cancer treatments, despite the survival and death probabilities being objectively equivalent.

Another common explanation for gender differences in risk perceptions is based on biological differences. However, recent research (for example, Flynn *et al.*, 1994; and see also Slovic, 1997) has reduced the salience of a purely biological approach. Flynn, Slovic, and colleagues found that: (i) nonwhite males and females are more similar in their perceptions of risk than are white males and females; and (ii) white males are different from everyone else in their perceptions and attitudes toward risk. Biological explanations imply that the differences between men's and women's risk perceptions would transcend racial boundaries.

In the study by Flynn *et al.* (1994), 1,512 Americans were asked, for each of 25 hazard items, to indicate whether the hazard posed (1) *little or no risk*, (2) *slight risk*, (3) *moderate risk*, or (4) *high risk* to society. Results showed that the percentage of high-risk responses was greater for women than men on every item. Similar analyses showed that the percentage of high-risk responses was greater among people of colour than among white respondents for every item studied. The most striking result, however, is shown in Figure 1, which presents the mean risk ratings separately for white males, white females, nonwhite males, and nonwhite females. For all 25 hazards, white males' risk perception ratings were consistently much lower than the means of the other three groups.

This 'white male' effect seemed to be caused by about 30% of the white male sample that judged risks to be extremely low. When these low-risk white males (LRWM) were compared with the rest of the respondents, they were found to be better educated, had higher household incomes, and were politically more conservative. They also held very different attitudes,

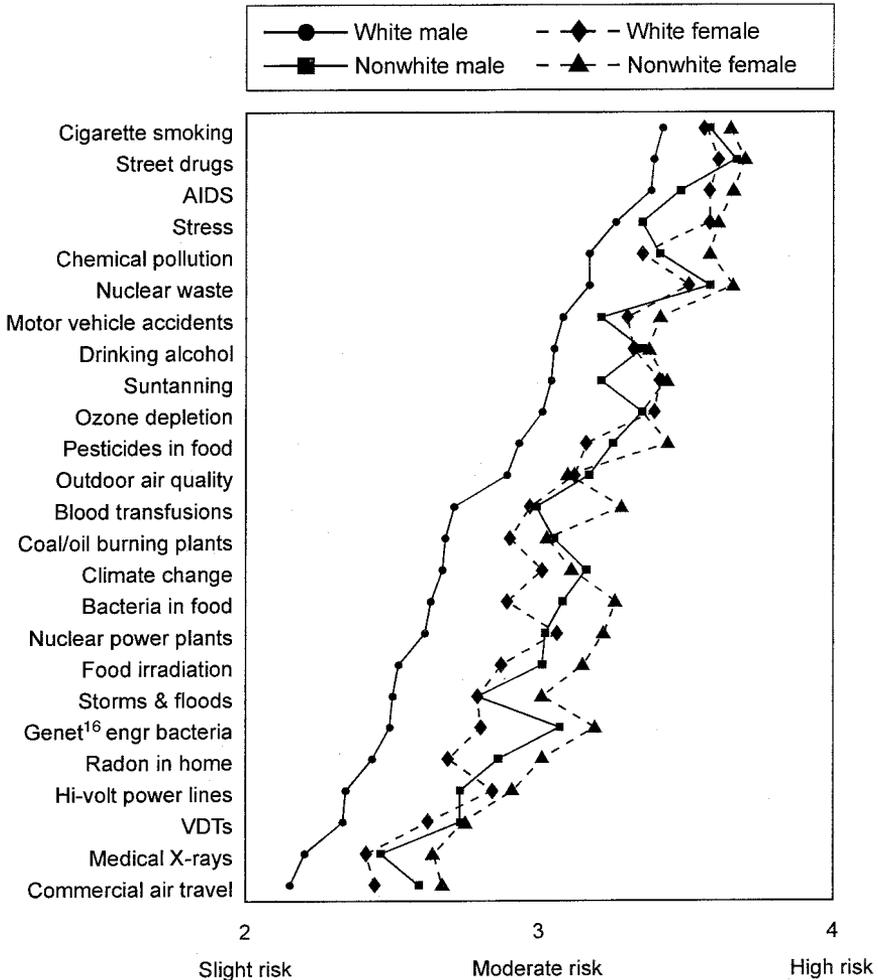


Figure 1. Mean risk-perception ratings by race and gender. Source: Flynn et al. (1994). Reprinted with permission.

characterized by trust in institutions and authorities and by anti-egalitarianism, including disinclination toward giving decision-making power to citizens in areas of risk management.

The role of sociopolitical factors: people vary in their worldviews, trust, and control

The results described above led to the hypothesis that differences in worldviews, trust, control, and other sociopolitical factors could be key determiners of gender and race differences in risk judgments and that risk perceptions may reflect deep-seated values about technology and its impact on society (Barke et al., 1997). White males may perceive less risk than others because they are more involved in creating, managing, controlling and benefiting from technology. Women and nonwhite men may perceive greater risk because they tend to be more vulnerable, have less control, and benefit less. Indeed, some research suggests that risk perceptions are related to individuals' levels of decision power (for example, whether they have high or low ability to influence decisions about the use of hazards such as liquefied

petroleum gas) and their interest in a hazard (for example, direct, indirect, or adversarial) (see, for example, Kuyper and Vlek, 1984; Baird, 1986; Bord and O'Connor, 1997).

Understanding how sociopolitical factors differ by gender and race is important because it would help explain why attempts to impose the *élite* view of the world have often failed to improve public acceptance of risks. In the present research we expected to find that white males differ from others in that they have lower risk perceptions across a range of hazards and tend to endorse hierarchical and anti-egalitarian views.

Method

The present paper reports data collected as part of a national telephone survey designed to test hypotheses about risk perceptions over a range of hazards. The survey contained questions about worldviews, trust, and a range of demographic variables. Also included were questions designed to assess the respondent's recognition of potential adverse effects from risk-induced stigmatization of places and products associated with transport of chemical and radioactive wastes (see, for example, Gregory *et al.*, 1995).

Procedure

A stratified random sample of household members over 18 years of age in the United States was surveyed by telephone from September 27, 1997 through February 3, 1998. A total of 1,204 completed interviews were obtained with an overall response rate of 46.8%. Interviewing was conducted within a sample of US households and three racial/ethnic groups (African-American, Hispanic, and Asian) were oversampled to permit reliable analyses of differences among these minorities. Race and ethnicity were combined in one question for the survey: 'What is your race or ethnic background? Do you consider yourself White, Hispanic, Black, Asian, American Indian, multiracial or multiethnic, or other?' This procedure relies on self-definition, which as Cooper (1994) points out is the 'only legal basis for racial classification' in the United States. The final survey database contains responses for 672 white Caucasians, 217 African-Americans, 180 Hispanics, 101 Asians, and 34 respondents of Native American, multiracial/ethnic, or other origin. Interviews were conducted in English and Spanish. The mean age was 43.5 years and 45% were males and 55% were females. The average interview length was approximately 35 minutes. Data displays that include both race and gender characteristics are unweighted. All other uses of the data are weighted to the US census estimates of the 1997 US population in terms of race and gender, resulting in a weighted sample size of 859 respondents. The data are weighted so that individual ethnic/racial groups within the non-white group will be representative of the US non-white population.

Survey design

The survey contained questions on a wide variety of environmental and health hazards. Only the items relevant to this article are described here.

All respondents were asked to consider health and safety risks 'to you and your family' and to indicate whether there is *almost no risk*, *slight risk*, *moderate risk*, or *high risk* from each of 13 hazardous activities and technologies (for example, blood transfusions; motor vehicles; nuclear power plants; vaccines). We shall refer to these data as *perceived risk to individuals*, in contrast to the next series of questions in which all respondents were asked to indicate (on the same four-category scale) the level of health and safety risks from 19 hazards for 'the

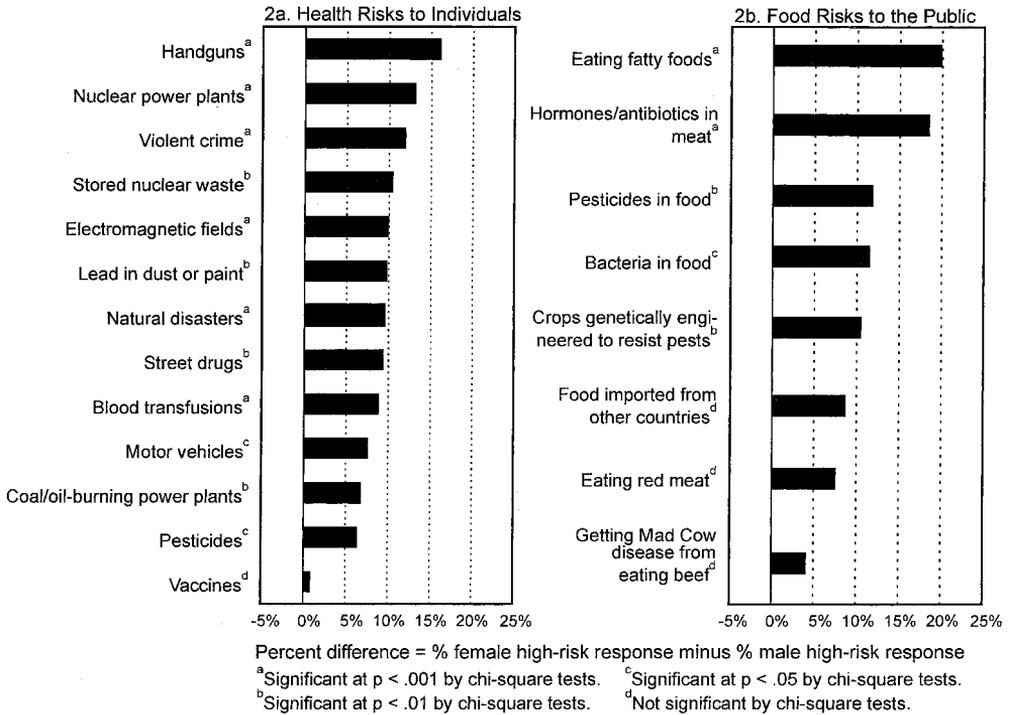


Figure 2. Percentage difference in high-risk responses of males and females for (a) perceived health risks to individuals ('you and your family') and (b) perceived food risks to the American public. Source: 1997 National Risk Survey, $N = 859$, data weighted for race and gender.

American public as a whole' (including most of the 13 hazards for which perceptions of risk to individuals and their families were elicited). A general risk perception index was calculated for each respondent by averaging ratings of risk to the public across the 19 hazards.

An additional eight items specifically about food hazards (for example, bacteria in food, hormones and antibiotics in meat, eating fatty foods) were rated for their risks to the public on the four-category scale described above.

Finally, all respondents were asked a series of questions regarding the effects of stigma, worldviews, trust, and demographics (including gender and race).

Results

Risk perceptions

Gender differences. We found differences in the high-risk responses of males and females [see Figure 2(a)] with the percentage of high-risk responses greater for females on every item. A similar pattern was found for ratings of health risks to the American public, and ratings of the public risks of food hazards [see Figure 2(b)].

Racial differences. Likewise, examining the differences between the percentages of whites and nonwhites who rate a hazard as a 'high risk' to individuals, the percentage of high-risk responses was greater for nonwhites on every item [see Figure 3(a)]. A similar pattern was found for ratings of health risks to the American public, and ratings of the public risks of food hazards [see Figure 3(b)].

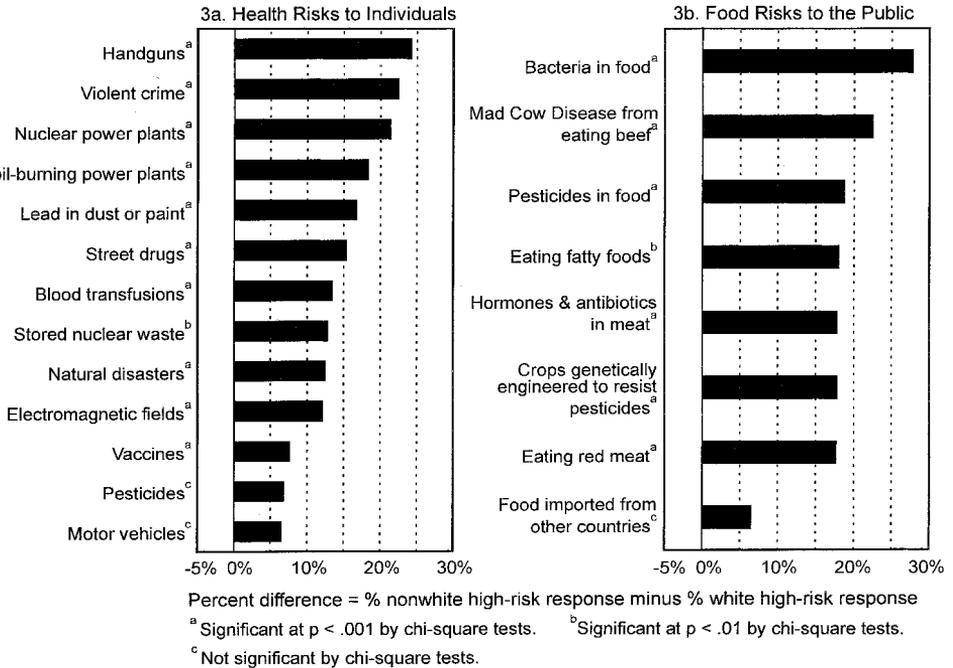


Figure 3. Percentage difference in high-risk responses of whites and nonwhites for (a) perceived health risks to individuals ('you and your family') and (b) perceived food risks to the American public. Source: 1997 National Risk Survey, N = 859, data weighted for race and gender.

The white male effect. Examining the differences between the percentages of white males and the rest of the sample who rated hazards as a 'high risk' to individuals and to the public, we found high-risk responses were lower for white males on every item (see Figures 4 and 5). That is, white males were always less likely to rate a hazard as posing a 'high risk.' This was particularly true for handguns, nuclear power plants, second-hand cigarette smoke, multiple sexual partners, and street drugs.

Similarly, white males differed from others in their ratings of perceived risks to individuals and the public. Mean ratings of risks to individuals were lower for white males than for white females, nonwhite males, and nonwhite females [see Figure 6(a)]. A similar pattern was found when ratings of risks to individuals were considered separately for males and females in each racial group [see Figure 6(b)], although the Asian males scored lower (2.68) than white males (2.80) in rating the risks of motor vehicles.

The mean ratings of risks to the American public showed that white males differed from white females, nonwhite males and nonwhite females [see Figure 7(a)]. Nonwhite females show the highest risk estimates for several hazards (for example, lead in dust or paint, blood transfusions). When perceived public risk ratings are considered separately for males and females in each racial group [see Figure 7(b)], Asian males show similar or lower perceptions of public risks than white males for several hazards (for example, motor vehicles, tap water, vaccines, cellular phones). Some hazards (for example, pesticides) display greater variance in risk ratings across the groups than others (for example, motor vehicles).

Perceptions of risk to the American public from food hazards showed that, compared with white females and nonwhite males and females, white males had lower mean ratings for all items [see Figure 8(a)]. Nonwhite females again show the highest risk estimates for several items (for example, bacteria and pesticides in food). When ratings from males and

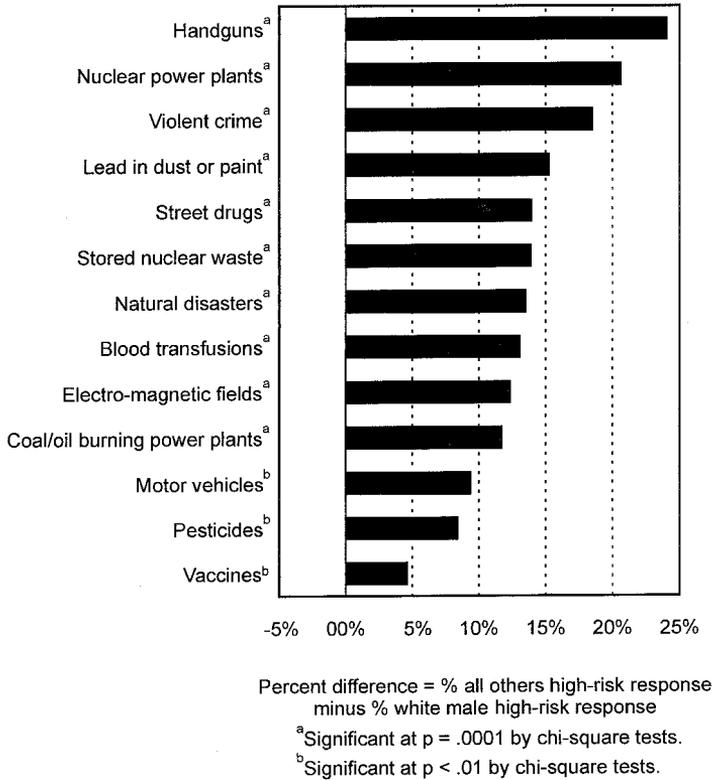


Figure 4. Percentage difference in high-risk responses of white males and others: perceived health risks to individuals ('you and your family'). Source: 1997 National Risk Survey, $N = 859$, data weighted for race and gender.

females were considered separately for each racial group, the 'white male' effect was less apparent. Asian males gave less risky ratings than white males did for several food hazards, such as imported food, eating red meat, and hormones/antibiotics in meat [see Figure 8(b)].

Behavioural intentions

Gender and racial differences were also evident on items measuring behavioural intentions about risky activities and technologies (administered to only half of the sample; weighted $N = 426$). For example, responses to the statement 'If I were hospitalized and my physician recommended a blood transfusion, I would accept blood from a blood bank' showed that a higher proportion of females than males disagreed or strongly disagreed that they would accept blood (44.3% vs. 23.6%, data weighted for race and gender, $N = 426$). Hispanic people disagreed or strongly disagreed more than whites (44.7% for Hispanics vs. 30.5% for whites); likewise African-American people disagreed or strongly disagreed more than whites (43.6% for African-Americans vs. 30.5% for whites; in these comparisons the data were weighted for gender only, $N = 611$). White males were less likely to disagree or strongly disagree than Asian females (23.0% for white males vs. 42.9% for Asian females) but more likely to disagree or strongly disagree than Asian males (17.6%) (data unweighted). All differences were significant at $p < 0.05$ by chi-square tests, except for Asian males versus white males.

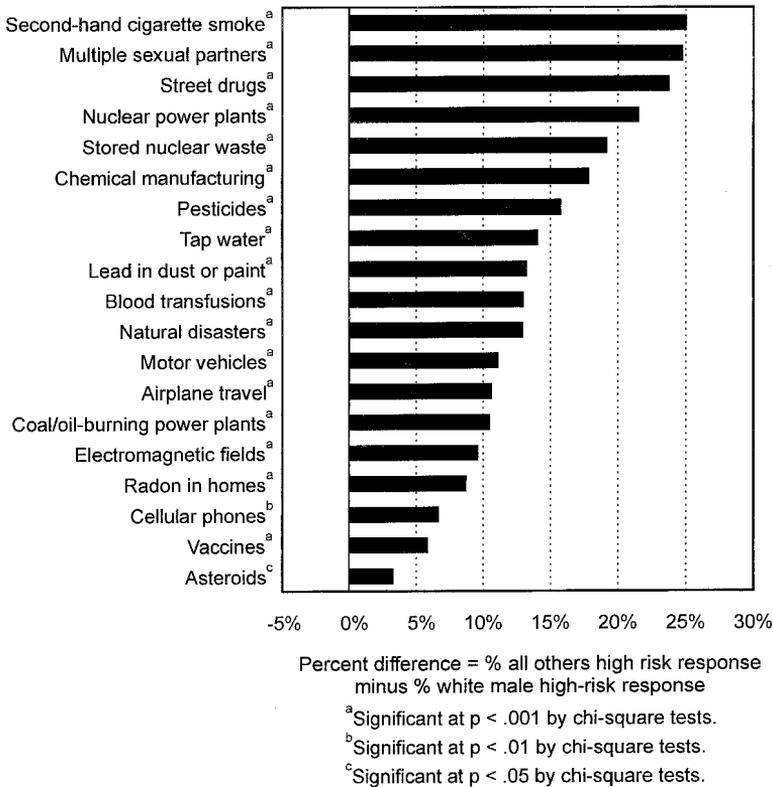


Figure 5. Percentage difference in high-risk responses of white males and others: perceived health risks to American public. Source: 1997 National Risk Survey, $N = 859$, data weighted for race and gender.

Sociopolitical factors

What differentiates white males from the rest of the sample? Turning to attitudes, we found that white males seemed to demonstrate different views from others on a range of questions about worldviews, trust, and potential for chemical and radioactive waste hazards to stigmatize places and products. [For the items below, all analyses used data weighted for race and gender to match the US population as a whole, $N = 859$. All differences are significant by chi-square tests at $p < 0.05$, with the exception of item (c) where $p = 0.05$.]

Worldviews. White males displayed more hierarchical and individualistic views and less fatalistic and egalitarian views. Fatalism is reflected in statement (a) below; hierarchical views by statements (b) and (c); egalitarianism by (d) and (e); individualistic views by (f) and (g). Specifically, when compared to all other respondents, white males were more likely to:

- (a) disagree that 'I have very little control over risks to my health' (83.4% vs. 76.3%);
- (b) disagree that 'I often feel discriminated against' (81.3% vs. 67.6%);
- (c) agree that when a risk is very small, it is OK for society to impose that risk on individuals without their consent (20.8% vs. 15.6%);
- (d) disagree that the world needs more equal distribution of wealth (40.1% vs. 23.3%);
- (e) agree that we have gone too far in pushing equal rights (49.8% vs. 37.5%);
- (f) agree that people with more ability should earn more (88.9% vs. 81.6%); and

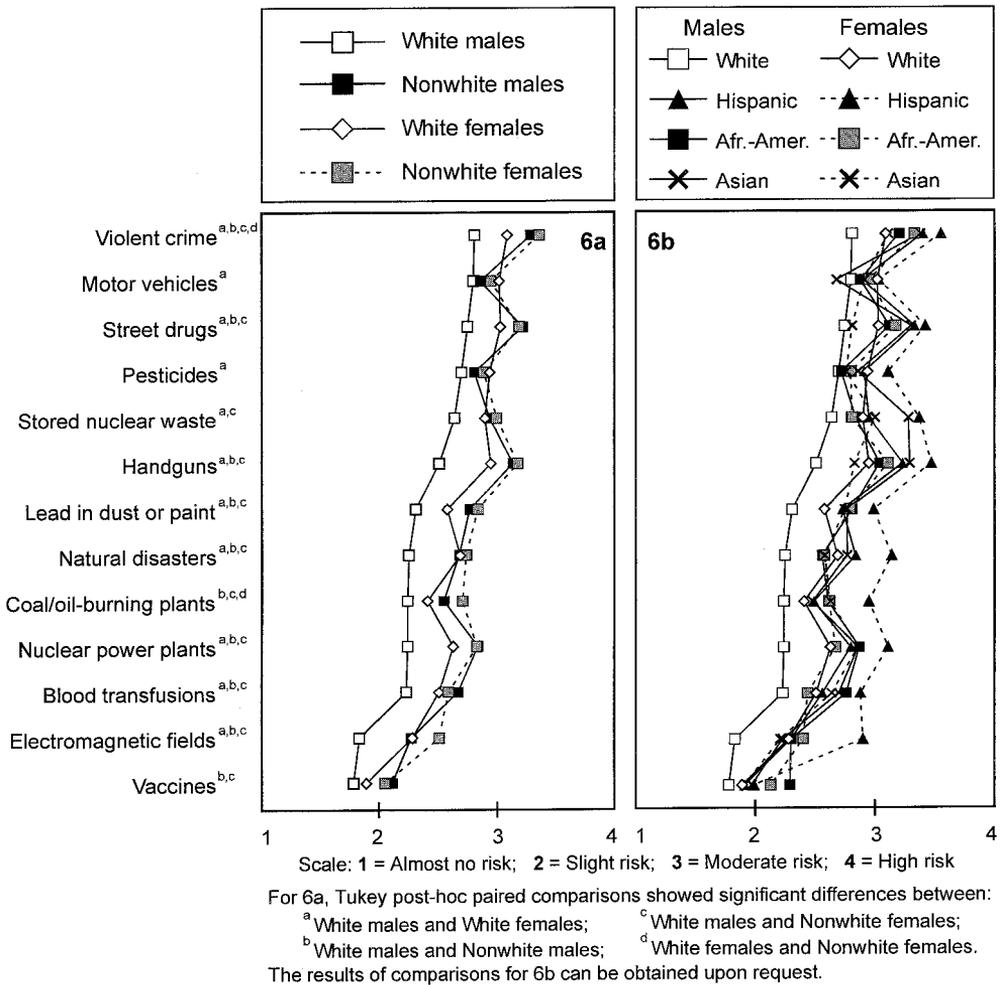


Figure 6. Mean ratings of perceived risks to individuals and their families for (a) white and nonwhite males and females (data weighted for race and gender, $N = 859$), and (b), white, Hispanic, African-American, and Asian males and females (data not weighted, $N = 1170$). Source: 1997 National Risk Survey.

(g) disagree that the government should make rules about people's personal risk-taking activities (86.8% vs. 74.6%).

Trust. White males seemed more trusting of technological hazards and less trusting of government, possibly because they prefer to be in control of policy and decision making. They were more likely than the others to:

- (a) disagree that people living near a nuclear power plant should be able to vote and to close the plant if they think it is not being run safely (34.3% vs. 12.9%); and
- (b) disagree that the federal government can be trusted to properly manage the risks from technology (74.7% vs. 67.8%).

Stigma. White males were far less worried about adverse public responses from risk exposure to chemical and radioactive waste hazards. They were more likely than the others to:

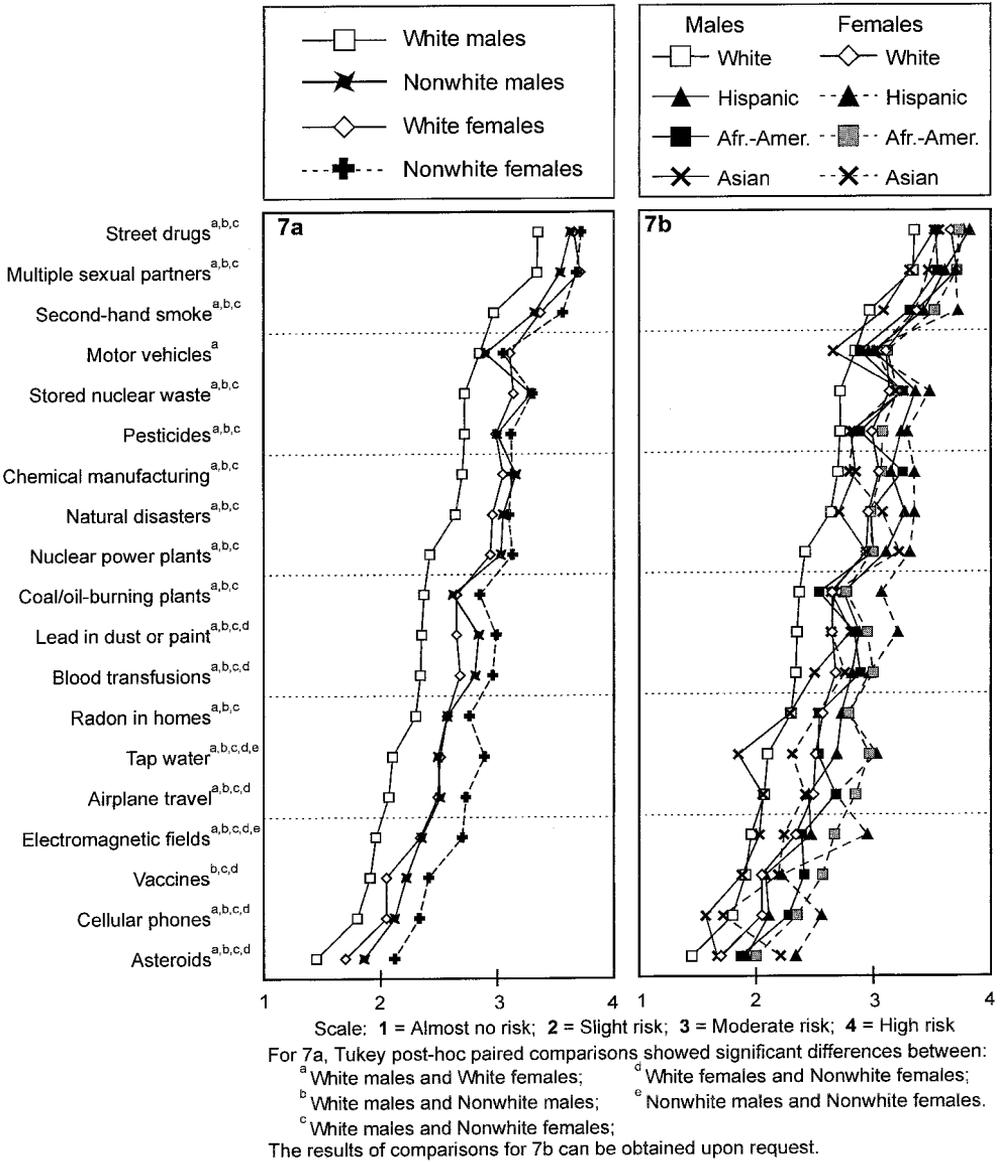


Figure 7. Mean ratings of perceived risks to the American public for (a) white and nonwhite males and females (data weighted for race and gender, N = 859), and (b) white, Hispanic, African-American, and Asian males and females (data not weighted, N = 1170). Source: 1997 National Risk Survey.

- (a) disagree that the selection of an existing highway for future transportation of nuclear and chemical waste would lower the value of nearby homes (40.5% vs. 16.4%); and
- (b) disagree that farm products are less acceptable to the public when radioactive waste is transported past farms (59.9% vs. 32.0%).

Other social and demographic variables

Since gender and race are correlated with other variables such as age, income, education, and

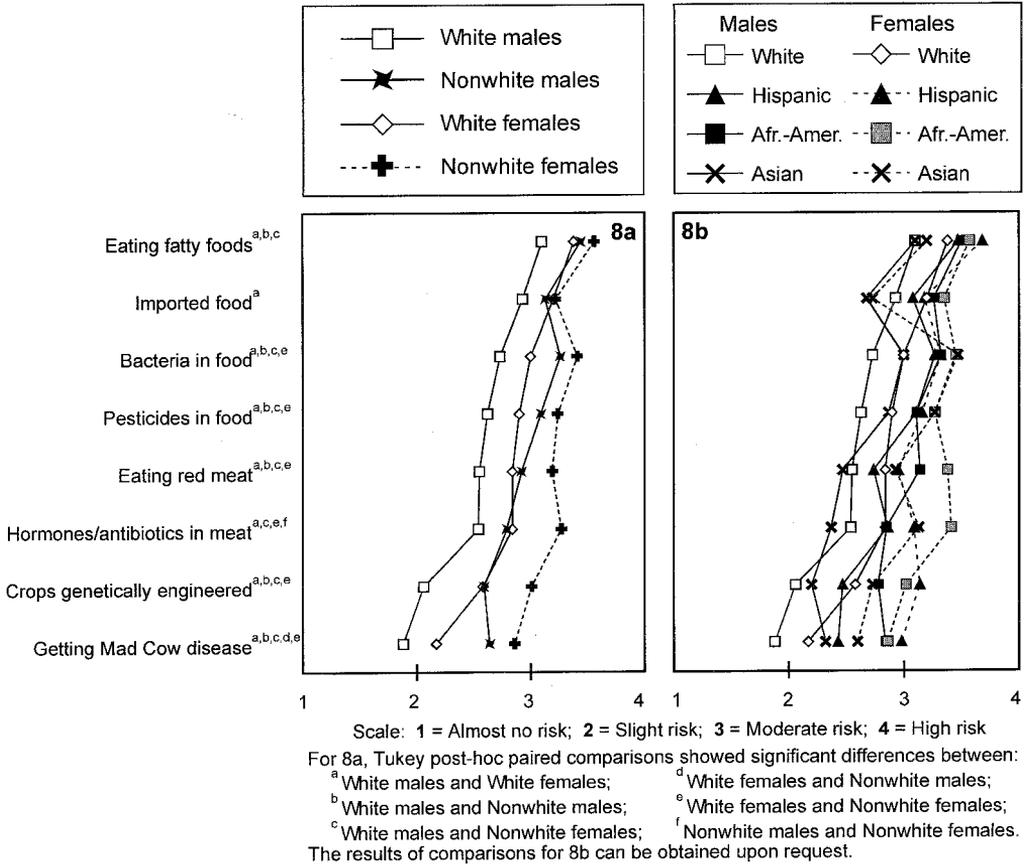


Figure 8. Mean ratings of perceived risks to the American public for (a) white and nonwhite males and females (data weighted for race and gender, $N = 859$), and (b) white, Hispanic, African-American, and Asian males and females (data not weighted, $N = 1170$). Source: 1997 National Risk Survey.

political orientation, we conducted regression analyses to see if gender and race were still significant predictors of overall risk perceptions after these other variables were controlled statistically. The analyses showed that gender, race, and 'white male' remained highly significant predictors of the hazard index, even when the other variables were controlled statistically.

Discussion

As expected, our survey revealed that men rate a wide range of hazards as lower in risk than do women. This result is consistent with gender differences found previously in many studies (for example, Brody, 1984; Steger and Witt, 1989; Gwartney-Gibbs and Lach, 1991; Gutteling and Wiegman, 1993; Stern *et al.*, 1993; Flynn *et al.*, 1994). Our survey also revealed that whites rate risks lower than do nonwhites. Nonwhite females often gave the highest risk ratings. The group with the consistently lowest risk perceptions across a range of hazards was white males, a result replicating the earlier research by Flynn *et al.* (1994). A few exceptions were found: compared with white males, Asian males gave lower risk ratings to six items (motor vehicles, tap water, cellular phones, imported food, eating red meat, and

hormones/antibiotics in meat). Furthermore, we found sizeable differences between white males and other groups in sociopolitical attitudes. Compared with the rest of the sample, white males were more sympathetic with hierarchical, individualistic, and anti-egalitarian views, more trusting of technology managers, less trusting of government, and less sensitive to potential stigmatization of communities from hazards. These positions suggest greater confidence in experts and less confidence in public-dominated social processes.

Our data support the view that differences cannot be explained entirely from a biological perspective. Explanations based on biological factors would require men and women to show discrepancies in their risk perceptions regardless of race. Clearly, this is not the case, at least for the environmental and health hazards studied here. Sociopolitical explanations are made more salient by our finding that compared with others, white males seem to promote individual achievement, initiative, and self-regulation, trust in experts and risk proponents, and intolerance of community-based decision and regulation processes. As a consequence, we speculate that the world seems safer and hazardous activities seem more beneficial to white males than to other groups. For people who place less weight on the importance of individual achievement, and more weight on distributing wealth equitably and endorsing community-based regulation, many hazardous technologies and activities are viewed as posing great risks. Compared with white males, many females and nonwhite males tend to be in positions of less power and control, benefit less from many technologies and institutions, are more vulnerable to discrimination, and therefore see the world as more dangerous. Further investigation of the role of a broad array of sociopolitical factors in risk judgments is recommended to clarify gender and racial differences. It may be that the low risk white males see different things at risk than do other citizens.

Although our data showed that white males stood apart from others, the data also revealed substantial heterogeneity in risk perceptions among the race and gender groups that comprised the 'other' category. That is, risk perceptions varied considerably across African-American, Asian, and Hispanic males and females. The heterogeneity implies that risk perceptions depend importantly on the characteristics of the individuals facing the risk. Researchers should examine more closely the variation across individuals within these groups. Although resources did not permit finer analyses in the present study, Flynn *et al.* (1994) found that about 30% of their white males had extremely low risk perceptions. Their results suggest that race/gender groupings may be decomposed further into subgroups with particularly high or low risk perceptions.

Furthermore, while there is a tendency for gender and racial groups to align along social and political attitudes, it does not rule out the idea that sociopolitical attitudes also vary within groups. That is, perhaps some individuals are more prone than others to endorsing individualism or egalitarianism, regardless of gender or race. Some white males may be closer to typical Hispanic women in their views on the value of community-based regulation and equitable distribution of wealth. Some African-American women may be closer to typical white males in their endorsement of individual achievement and reward. Clearly, aligning particular sociodemographic groups with certain perspectives may overlook the possibility that there is variation across individuals regarding their sociopolitical attitudes and associated risk perceptions.

Viewing risk as a social construct dependent on characteristics of individuals raises important questions. What might be found in societies not dominated by white males? Are women bigger risk takers in matrilineal societies and are there some Asian or African countries where nonwhites perceive lower risk than do whites? Furthermore, even within societies seemingly dominated by the white male perspective, there seem to be some hazardous activities for which women are willing to take the greatest risks (such as smoking).

Can differences in worldviews, feelings of trust, and sensitivity to potential product and community stigmatization, explain risk perception differences across cultures and sub-cultures?

Furthermore, given that we found risk perceptions varied more for some hazards (for example, tap water, genetically engineered crops) than for other hazards (for example, stored nuclear waste, eating fatty foods), the type of hazard typically examined in risk perception research should be considered. Our findings of lower risk ratings by Asian males than by white males on several items suggested an interaction between characteristics of the hazard being rated and of the individual doing the rating. It seems possible that we may have found white women to have the lowest risk perceptions if household rather than technical risks were studied, for instance.

Research on the heterogeneity of risk perceptions across various socio-cultural groups has important practical implications. Despite knowing very little about the risk perceptions and sociopolitical attitudes of minority groups, they are perhaps precisely the people who might be at greatest risk (and who might receive most benefit) from some activities or technologies. Without understanding the complex factors influencing perceptions, risk communicators and regulators cannot tailor their messages or policies appropriately to the target populations.

Overall, efforts to explain risk perception differences among people of different genders and races would be best addressed by incorporation of what we can learn about social roles, status differentiation, political values, and concepts of fairness. Attempts to re-align risk perceptions according to the white male view of the world are likely to be unsuccessful. We expect that risk controversies can be better avoided and/or resolved when discussions and negotiations include the full spectrum of interested and affected parties. Some may fear such an approach may be more expensive because of the transaction costs. However, the current stalemates in managing numerous hazardous conditions from nuclear power to chemical contamination cleanups show that social conflict has extremely high costs, economic and otherwise. Whether decision-sharing approaches that depend upon compromise and negotiation work as well or better than the current approaches is a question that can be answered with empirical research. Investigators should be careful, however, to pay close attention to the inevitability that just as risk perceptions are based on a wide range of value-laden judgements, views on how to define the economic and health benefits and costs will be disparate. Acknowledging the complexity of perspectives within an already diverse sample of US residents is the first step towards increasing the efficiency and effectiveness of social decision making in general, and risk management and communication in particular.

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