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## Development of Gender Differences in Risk Perception

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Development of Gender Differences in Risk Perception

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Running Head: GENDER RISK PERCEPTION

Abstract

Women have, in many studies, rated environmental and health hazards as more risky and less acceptable than men rate the same risks. Biologically-based sex differences fail to provide an adequate explanation, however, as gender differences do not hold true in non-white populations. Ratings by minority males and females, in fact, both correspond roughly to those of white females. Other possible explanations, such as differences in familiarity, are also refuted, as gender differences are found when there are no differences in familiarity. Some explanations cite different socialization patterns for men and women, but this would probably be expected among minority populations as well. Differences may be best explained by a combination of socialization and sociopolitical factors such as power, control and vulnerability.

A pilot study was conducted, with a sample of mostly white participants, which replicated parts of the study by Flynn, Slovic, and Mertz (1994). Results showed a gender difference in risk ratings ( $p = .06$ ). A strong negative correlation ( $r = -.3155$  with  $p = .0001$ ) was found between risk ratings and scores on a measure of trust in government and industry. This supports the sociopolitical difference explanation.

This explanation is further supported by a similar study of high school students which found no gender differences and risk scores significantly higher than those of the first sample ( $p = .001$ ). Further research is suggested.

Introduction

Although we rarely think about the dangers of daily life unless something brings them to our attention, many life-threatening hazards are present all of the time. Some are natural such as diseases and earthquakes. Many others are created by modern society, such as automobiles and industrial pollution. A person cannot get out of bed in the morning without subjecting him/herself to an infinite variety of possible life-threatening accidents. And one cannot stay in bed without subjecting oneself to other risks. Even eating food carries the potential for poisoning or choking (and refraining from eating obviously carries hazards of its own).

Although risks in themselves are unavoidable, the way those risks are perceived influences our actions. If a person perceives a risk as unacceptably high, he/she might go to great lengths to avoid it (avoiding high-crime areas of the city, for example, or participating in demonstrations and lobbying for stricter controls on industrial pollution).

The way that the general public perceives risk situations is very different from the way experts generally categorize risks. While experts tend to think in terms of deaths per year or some other quantifiable statistic, many other factors are usually considered when the non-expert judges whether or not a risk is acceptable and how far he/she is willing to go to avoid it.

Bem (1971) explained the way non-experts often judge risks. The expected value of a particular action, which is objective

and statistically based, the one experts use, often gives way to it's expected utility. This includes the expected value, but also takes into account a person's subjective values and perceptions.

Slovic (1987) identified many of these factors and the way they work together in a person's judgment of a given risk. Some of these contributing factors are whether exposure to the risk is voluntary or forced, what benefits are gained from accepting the risk, and how catastrophic the possible consequences are and whether they threaten future generations. For example, although automobile travel is statistically one of the most life endangering activities in our society, it is voluntary and well understood, the possible consequences are not particularly catastrophic (compared to a nuclear meltdown, for example) and there is not much threat to future generations from our present actions. People usually consider these and the benefits gained from automobile travel and continue to use cars.

Research on perception of risk has repeatedly found that women, on average, tend to view most hazards as more risky and less acceptable than men, who tend to view risks as smaller and more acceptable. (Flynn, Slovic & Mertz, 1994; Gutteling & Wiegman, 1993) Several possible explanations have been raised to explain this phenomenon.

#### **Sociopolitical Factors**

Flynn, et al. (1994) asked participants in their study to rate a variety of environmental health risks on a four point

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scale from "almost no risk" to "high health risk." Results showed significantly lower ratings by white men than white women. Those gender differences did not appear, however, among non-white participants. In fact, nonwhite men and women alike rated risks similarly to white women, with white men's ratings significantly lower than all three other groups. These results suggest that gender differences in this area are not biologically sex related, but may instead be related to sociopolitical factors such as status, control, and vulnerability.

To further support this, Flynn, et al. took a sub-group of those white males who rated risks as especially low. He compared their reported attitudes to those of the remaining respondents. The extreme low risk sub-group members were more likely to express attitudes which supported science and technology and preferred trusting of government and experts to manage environmental hazards over giving decision-making power to citizens. They reported more confidence in their own control of risks to their health and the ability of future generations to take care of themselves when faced with the health consequences of today's technology. These results may suggest that the low risk-raters (white men) may be more closely tied to science and technology and receive greater benefits from them, supporting a sociopolitical explanation for risk perception differences.

#### **Socialization**

Gutteling and Wiegmen (1993) surveyed perceptions of three environmental hazards in the Netherlands and also found a

significant difference between men and women. Their results did not support the hypothesis that gender differences arose from women's lack of familiarity with technology, as women did not consistently report lower familiarity, although they did report greater assessed unacceptability. They also found that women reported more feelings of insecurity related to all three risks than men. The authors explained their results in terms of socialization processes which encourage women to take a more dependent role and be less inhibited about feelings of anxiety, while men are not allowed to show their weaknesses and are taught to deny fear. Women, therefore, express greater insecurity and weakness with regards to risks and are less accepting of hazards because they feel weaker in their abilities to deal with and control them.

### **Environmentalism**

Steger and Witt (1989) and Stern, Dietz and Kalof (1993) studied risk perceptions of environmental hazards through assessment of environmental activism and the fact that more women consider themselves environmentalist and are active in the environmental movement. This is linked to women's assessments of risks as higher and more unacceptable than men's. Both studies suggested that gender differences result from socialization processes.

Steger and Witt found women to report beliefs which corresponded with the "spaceship earth" view of the "New Environmental Paradigm," which emphasizes the interconnectedness of all living things on earth. This is compatible with a



nurturing and relationship-oriented socialization of women.

It is contrasted with men's socialization which places more emphasis on objective rules and regulations, further supported by findings which link men's environmental activism to policy revision and issue specific knowledge. More local, grass-roots activists are women while political lobbyists and major, nation-wide environmental groups are run by men.

Stern, Dietz and Kalof (1993) identified three value orientations which lead to action in support of environmental quality: egoistic, social-altruistic, and biospheric. They, like Flynn, et al., suggested that a subordinate or minority status leads women to be more sensitive to the environmental consequences of human activity. Relationship-centered socialization, as discussed by Steger and Witt, also contributes. These factors lead to a more altruistic and biospheric orientation, explaining why women tend to be more sensitive to environmental hazards than men. Activist men tend to be more motivated by egoism, giving their activism different forms of manifestation.

All of this literature together points toward an explanation for gender differences in risk perception which combines socialization and sociopolitical factors. Female socialization patterns which emphasize relationships and dependency are combined with lack of power and control and a greater sense of vulnerability while male patterns of independence, confidence and control combine with a societal reality which may provide greater rewards for men in trade for the greater risks of

industrial society. All of these factors (and possibly others) seem to create a situation in which men perceive the same situations as less risky and more acceptable than women.

### Development

If gender-appropriate risk perceptions are, at least partially a reflection of socialization, one would expect to find these gender differences developing along with other gender socialized traits. But very little has been done to examine risk perception from a developmental perspective. According to the Gender Intensification Hypothesis (Steinberg, 1993), socialization to behave in sex appropriate ways begins at birth. As children enter puberty, however, pressures begin to intensify, especially for girls. Around this time, achievement behavior becomes more sex-stereotyped (girls avoid math and science) and girls become more competent at and invested in forming intimate relationships. Peer acceptance becomes more and more important and, as teens begin to date, sex-role identity becomes an increasingly important aspect of identity. (Steinberg, 1993)

One study of optimistic bias, the tendency to rate risks as lower for yourself than for other people, found that sixth grade participants did exhibit significant bias (similar to that of adults), especially on controllable and stigmatizing events (such as drug use and AIDS). No gender differences were found in amount of optimistic bias, but they did not report actual risk perception ratings, so we don't know how boys and girls ratings related to one another. (Whalen, et al., 1994)

Another study by Quadrel, Fischhoff and Davis (1993) found

that the commonly held conception that adolescents engage in more risky behaviors because they think they are invulnerable and not really at risk is not true. Adolescents in their study rated risks at similar levels to adults (the authors suggested adolescents may engage in more risky behavior because they get more social benefits from taking those risks). Results were not, however, reported by sex, only by age group. The fact that adolescent risk perceptions were adult-like in other ways, however, along with ideas like the Gender Intensification Hypothesis, suggest that by mid- to late-adolescence, teens might be expected to exhibit the gender differences in risk perception that have been found among adults.

A set of studies by Carney (1971), conducted in 1968 and 1969, measured risk perception of certain hazards (mostly drug related) and the perceived effectiveness of different preventative and controlling actions. Adult groups (parents, teachers, and other concerned professionals), college students, and junior and senior high school students were all given a similar survey. Although age groups differed on what actions were thought to be effective controls, all ages rated risks similarly (adult ratings for self were lower, but ratings for young people were close to what the young people rated for themselves).

Carney reported all junior and senior high school students' mean risk ratings without indicating sex differences. For effectiveness of controlling actions, however, he separated scores by age (junior vs. senior high) and sex. Senior high

females consistently rated effectiveness higher than males.

No differences are apparent for the junior high students, however. Although this doesn't tell us anything about risk perception differences, it does locate the development of a gender distinction for a somewhat related measure between junior and senior high school.

It could be expected that, if gender differences in risk perception arise from socialized gender roles and related personality traits, that they would begin to appear by late childhood and early adolescence.

### Methods and Results

A two-part study was conducted which replicated parts of Flynn, et al.'s study. First, a group of students enrolled in an Environmental psychology class at Western Washington University were asked to rate a selection of 16 hazards taken from the Flynn, et al. study. The risks were mostly environmental, with three health risks involving alcohol use, AIDS and its transmission. They also rated how closely they agreed with five statements from the trust portion of Flynn, et al.'s study. (See Appendix A for survey). These subjects were then asked to administer the same survey to at least eight other people outside of the class. The total number of surveys analyzed was 245. All of the respondents were above the age of 19, ranging up into their sixties. Most were white, with only 20 classifying themselves as non-white, and probably from middle class backgrounds (university students and their friends).

Results showed a significant difference between the risk ratings of male and female respondents ( $F = 3.54$ ,  $p = .06$ ). Risks were rated on a four point scale, with 1 = almost no health risk, 2 = slight health risk, 3 = moderate health risk, and 4 = high health risk. The mean risk rating by males was 2.16. The mean rating by female subjects was 2.42. There was also a very significant negative correlation between risk ratings and trust scores, which were measured by agreement with the statement ( $r = -.3155$ ,  $p = .0001$ ).

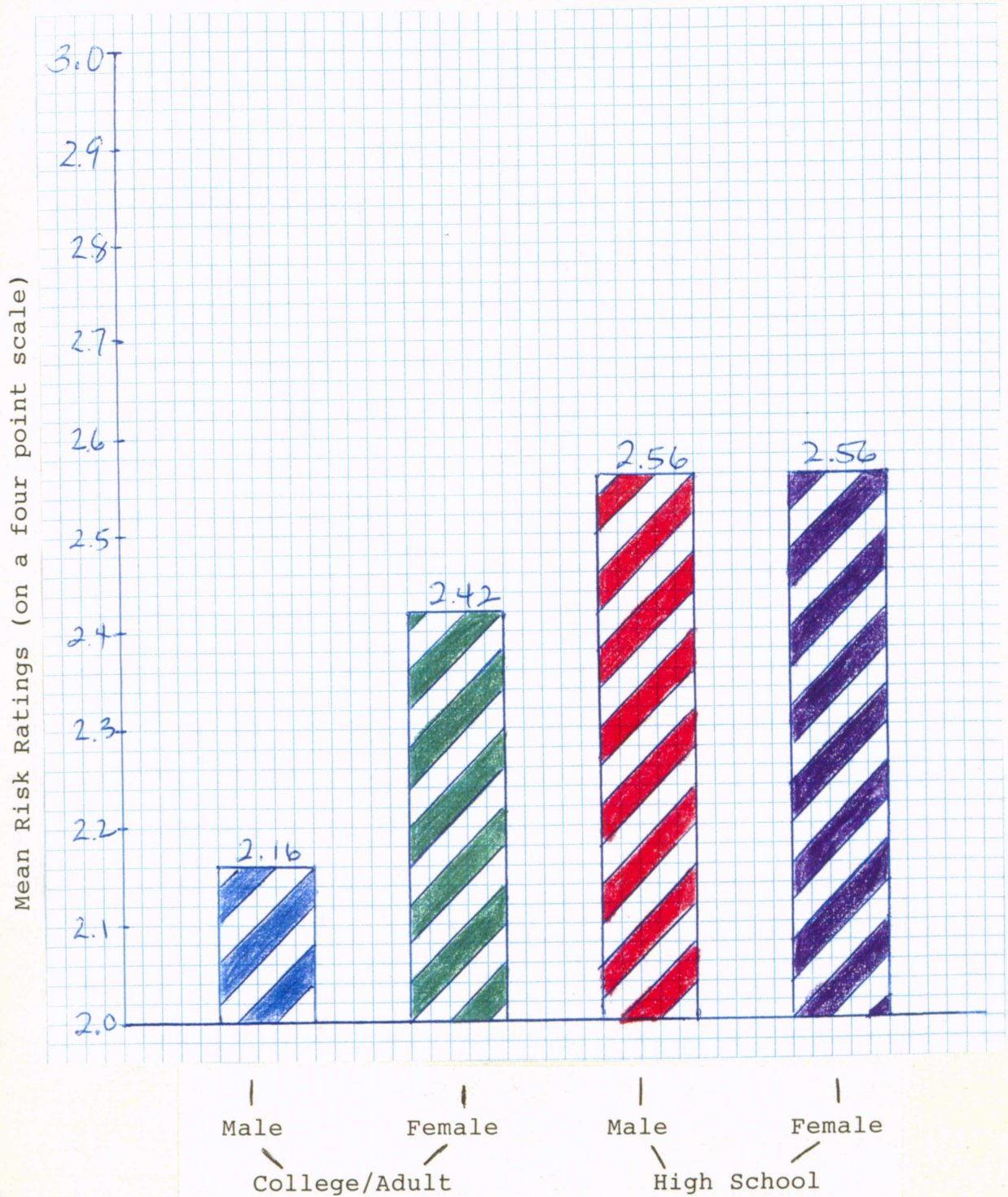
A similar survey was given to two health classes at Ferndale High School. Subjects were 10th, 11th and 12th graders with ages ranging from 15 through 18 (most were either 17 or 18). A total of 40 surveys were analyzed. The survey was different in that subjects were asked to rate the risks of medical x-rays and bacteria in food rather than radon and genetically engineered bacteria. This was done to insure that most subjects would be at least familiar with the existence of the risks. Cigarette smoking, illegal drug use and automobile travel were also rated, but these ratings were removed from the survey before analysis so that results would be more comparable to the findings of the previous sample. (See Appendix B)

In the high school sample, no gender differences were found. The mean rating by both males and females was 2.56. No correlation was found between risk ratings and the trust scale.

A comparison of the older and younger samples found a significant main effect ( $F = 12.36$ ,  $p = .001$ ). As shown in Figure 1, the older sample rated the risks lower.

Figure 1

Mean Risk Rating X Age and Gender Groupings



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Figure 1 about here  
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### Discussion

Previously, the question of when and how gender differences in risk perception had not been directly investigated. Conclusions were based on indirect inferences from other correlating data. The lack of gender differences in high school students points away from the socialization explanation. As discussed earlier, socialized gender traits tend to emerge strongly in early adolescence, increasing with time. If risk perception differences were associated to socialized gender role expectations, we would expect them to be fairly strong in 17 and 18 year old students.

This points us back to the role of sociopolitical power suggested by Flynn, et al. (1994). High school students, regardless of gender, have approximately equal amounts of power in society. Male and female college students and other adults have more power than high school students and, as a result, probably experience a greater sense of control over their environments and the associated risks. The fact that both male and female adults rated risks lower than the high school students supports the role of sociopolitical power in risk judgments.

The higher risk ratings of high school students goes against our traditional idea of teenagers' perceived invulnerability and further supports the research of Quadrel, et al. (1993),

discussed earlier. It seems clear that teenage high risk taking behavior is not because of perceived invulnerability. Teenagers in fact may feel even more vulnerable than adults.

Further research is warranted in the risk perceptions of younger children as well as teenagers. A more complete map of risk perception pattern development will allow us to make more informed inferences about what factors influence the way those perceptions eventually develop. Also, if teenagers in fact perceive the world as more risky than adults, why do they engage in more risky behaviors? More investigation needs to be done into the ways our risk judgments form and how those judgments influence our actions.



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## Appendix A

### Survey used by adult sample

#### Scale:

- 1 = almost no health risk
- 2 = slight health risk
- 3 = moderate health risk
- 4 = high health risk

#### AIDS

Nuclear waste

Chemical pollution

Suntanning

Ozone depletion

Drinking alcohol

Pesticides in food

Outdoor air quality

Blood transfusions

Climate change

Nuclear power plants

Coal/oil plants

Genetically engineered bacteria

Storms and floods

Hi-voltage power lines

Radon in homes

Trust scale: (rated by degree of agreement with statements)

A. "Future generations can take care of themselves when facing risks imposed on them from today's technologies."

B. "Government and industry can be trusted with making the proper decisions about risks from nuclear power."

C. "We can trust the experts and engineers who build, operate, and regulate nuclear power plants."

D. "Technological development is destroying nature."\*\*

E. "We have little control over risks to our health."\*\*

\*\*Ratings on D and E were scored negatively (high agreement equals low trust).

Appendix B

Survey for high school sample

Grade: \_\_\_\_\_

Age: \_\_\_\_\_

Sex: (circle one)      Male      Female

Please rate each of the following health risks on the following scale according to your own personal assessment:

- 1 = almost no health risk
- 2 = slight health risk
- 3 = moderate health risk
- 4 = high health risk

Illegal Drug Use \_\_\_\_\_ \*

Cigarette Smoking \_\_\_\_\_ \*

Drinking Alcohol \_\_\_\_\_

AIDS \_\_\_\_\_

Nuclear Waste \_\_\_\_\_

Chemical Pollution \_\_\_\_\_

Suntanning \_\_\_\_\_

Ozone Depletion \_\_\_\_\_

Automobile Travel \_\_\_\_\_ \*

Outdoor Air Quality \_\_\_\_\_

Pesticides in Food \_\_\_\_\_

Blood Transfusions \_\_\_\_\_

Global Warming \_\_\_\_\_

Nuclear Power Plants \_\_\_\_\_

Coal/Oil Plants \_\_\_\_\_

Bacteria in Food \_\_\_\_\_

Storms and Floods \_\_\_\_\_

X-Rays (medical) \_\_\_\_\_

High-Voltage Power Lines \_\_\_\_\_

(\* - data removed before analysis)

Rate your level of agreement with each of the following statements:

- 1 = strongly disagree
- 2 = disagree
- 3 = agree
- 4 = strongly agree

\_\_\_\_\_ Government and industry can be trusted with making the proper decisions about risks from nuclear power.

\_\_\_\_\_ Technological development is destroying nature.

\_\_\_\_\_ We have very little control over risks to our health.

\_\_\_\_\_ We have gone too far in pushing equal rights in this country.

\_\_\_\_\_ Local residents should have the authority to close a nuclear power plant if they think it is not run properly.

\_\_\_\_\_ If a risk is very small it is okay for society to impose that risk on individuals without their consent.