

Perceived Risk

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One prominent result of modern research is the development of sophisticated decision-making processes. These tools are finding their way into many facets of other research areas as well as into the public's hands. One good example is their application in risk-assessment techniques.

Since personal and social values can conflict with empirical knowledge, risk-assessment methods are being developed to help policy-makers and individuals make rational and cost-effective choices. Careful choices are essential in business, day-to-day life, and, of course, in policy development.

Risk assessments are based on knowledge of past scientific research and on information about current patterns of human behavior. The process is becoming one of the most viable methods of reviewing alternative solutions, behaviors, or responses to problems.

Assessment of risks is **not** designed to make judgments but to illuminate options. Therefore, there is no single correct choice or solution to a problem. Furthermore, decisions about risks frequently involve individual's personal preferences and values of the society-at-large.

To be effective, the decision-making process must be based on logic that is consistent in the application of the process. These *decision frameworks* must be carefully and explicitly developed. Non-universal values must be excluded. Although this is not totally possible, the more objective the framework that can be constructed, the better the decision. This will allow choice to be made rationally, using as much data as possible and all information that is available.

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Perceived risk is a function of information, knowledge, values and perception. The following exercise/activity is designed to illustrate that in many situations there is **no** correct answer, only **best** alternative choices.

Determining Perceived Risk

This activity is designed to help you appreciate hazards and the skill in the assessment of risk. After completing this activity, you will recognize that some risks are more readily controlled than others and that for some the risk is unknown. The assignment has five parts.

Part A: Personal Perceptions (Individually)

A list of potential hazards with which we are all familiar is provided (see Appendix A, the Perceived Risk Data Sheet on p. 238). Your task is to rank order the hazards according to your perception of the risk associated with each. For example, the hazard you rank #1 would be the item you feel represents the most risk; the second most risky would be #2, etc. Record your rank order in column A of the Perceived Risk Data Sheet.

Part B: Determining Consensus (Group of 5 students)

Discuss the hazard items in your group. Share the reasons why you ranked the hazard as you did. By consensus, *not a vote*, establish a new rank order for the items that reflects the group's perception. Record the rank order obtained by consensus in column B of the data sheet. When your group is in agreement, continue on to the next part of the activity.

Part C: Observable to Unknown (Group of 5 students)

In your group, classify each item on a continuum. The *decision framework*

you will use to classify the hazards involves a variety of characteristics. You should use a scale of -5 to +5.

Start by identifying those hazards or technologies that the group believes:

- Are **not** observable
- Are **unknown** to those individuals that might be exposed
- Seem to have a delayed effect
- Are a new risk or a risk **unknown** to science.

Rate these hazards in the negative range of the scale (-5 to 0). For example, those hazards or technological effects about which we have the least information would be classified as a negative (minus) 5.

The hazards or technologies that you feel are more well-known should be classified at the other end of the continuum of *decision framework*. Hazards or technological effects that:

- Are observable
- Are known to those who are exposed
- Have an immediate affect on persons or the environment
- Are old risks that are well-known to science and society.

When your group is in agreement, continue on to the next part of the activity.

Part D: Controllable to Dreadfulness (Group of 5 students)

A second part of the *decision framework* involves a different set of perceptions. Record your classification of the hazards for this portion of the decision framework in column D of the data sheet.

In your group, classify each hazard on a continuum such as you did for Part C. Use 0 to a -5 scale for those hazards that:

- Are uncontrollable
- Generate a high dread or fear
- Hold potential catastrophic

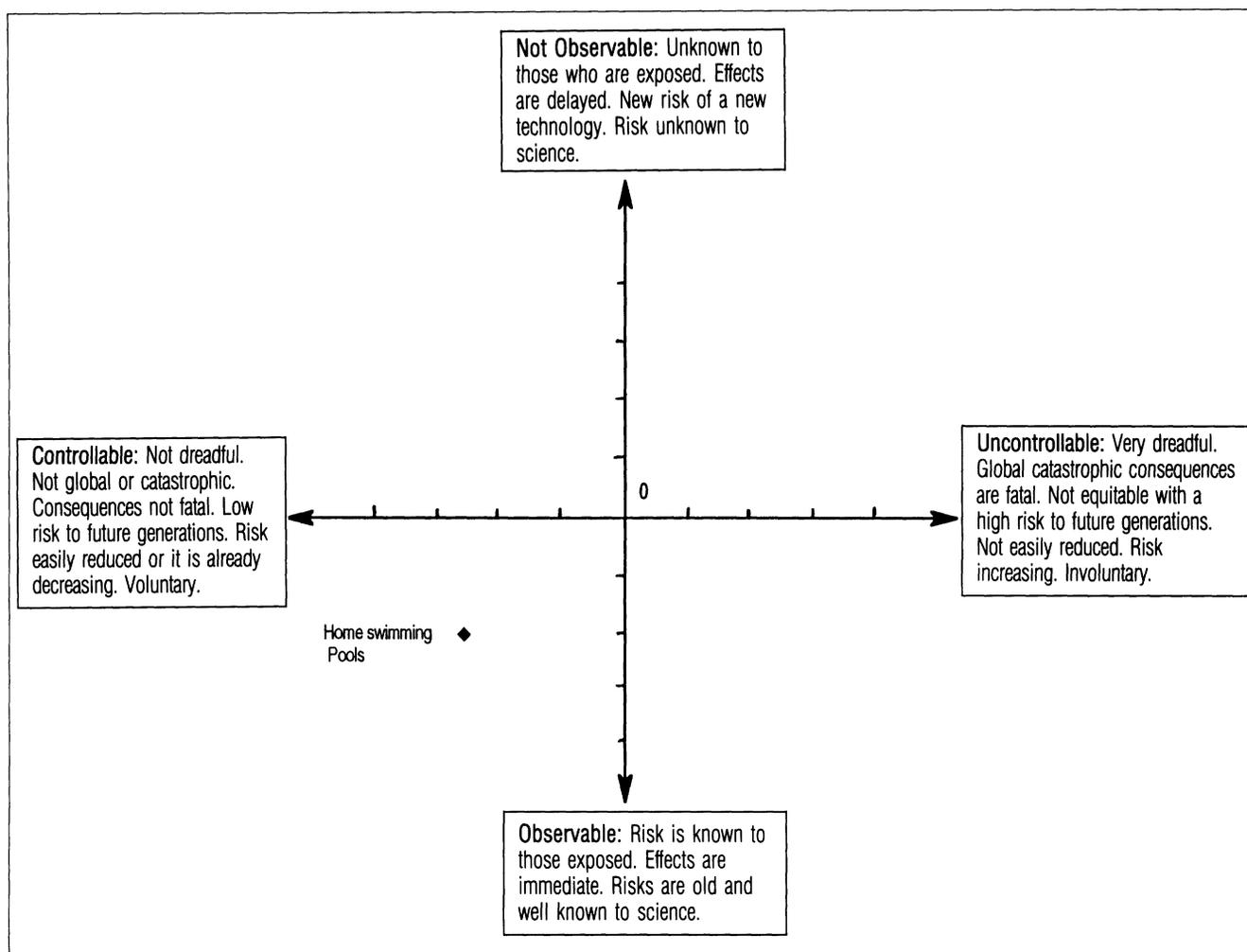


Figure 1. Risk Space Form.

consequences with high risk to future generations

d. Are probably increasing.

At the other end of the continuum evaluate the hazards using the scale from 0 to +5 to indicate whether the hazard:

- Is controllable
- Is not global or catastrophic and does not have fatal consequences
- Is a risk to future generations that can be easily reduced
- Is decreasing.

When your group is in agreement, continue on to the next part of the activity.

Part E: Mapping Perceived Risks (Small groups of 5 students)

Read the following example carefully. The mapping of home swim-

ming pools as a hazard is described below for your information.

Suppose that you classified home swimming pools as -2.5 (for their observable danger and immediate effects) in Part C. Refer to the "Risk Space" Form (see Figure 1). The vertical axis indicates the extent to which the hazard is understood; we measure *down* the axis 2.5 units.

Consider the consequences of the risk of home swimming pools and the potential for controlling the hazard as you did in Part D. Suppose you rated pools as -2.5 on the "dreadfulness" scale. (The horizontal axis of the Risk Space Form is the indication of the hazard's "dreadfulness.")

To map the placement of "home swimming pools," move to the left (minus) of the vertical axis approximately 2.5 units. Home swimming pools, as a hazard, would be mapped as shown on the Risk Space Form.

Using your classification of the various hazards, "map" all the hazards on the Risk Space Form (Figure 1). When your group is in agreement and has finished the map, check your work against the map available from your instructor.

Comments to the Teacher

The Risk Space Form provided to the students should be a copy of the axes without the various hazards (Figure 1).

An overhead transparency of the Risk Space Diagram modified after M. Granger Morgan, 1993 (Figure 2) should serve as the basis for closure discussion. The class should review the overall placements of the hazards and discuss the implications. Point out that the risks plotted in the upper right quadrant of the "risk space" are most likely to provoke calls for government

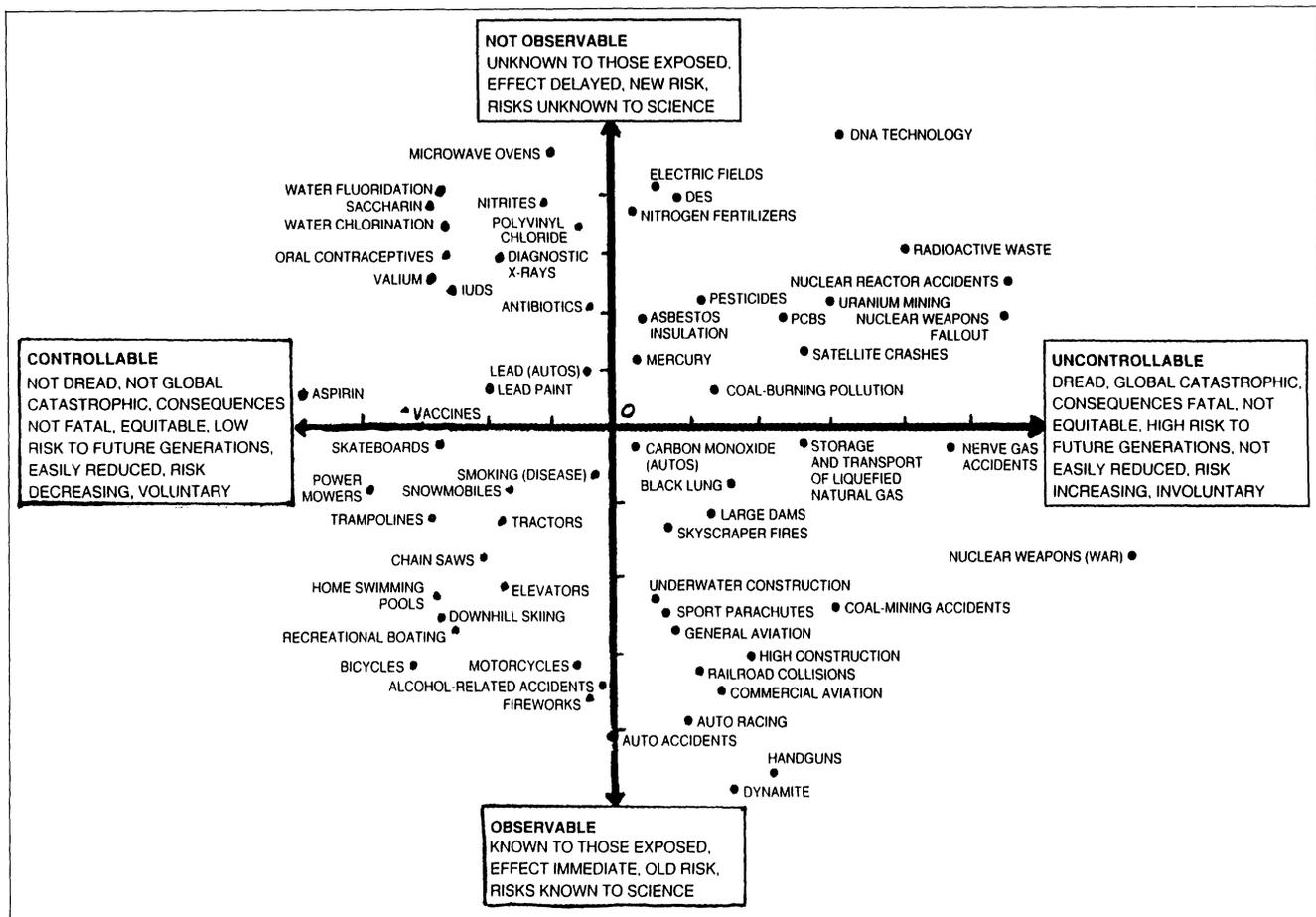


Figure 2. Risk Space Diagram for a variety of hazards (after M. Granger Morgan, *Risk Analysis and Management, Scientific American*, July 1993, p. 41.)

regulation. The issue to address is whether governmental regulation is appropriate or not. Then point out that proposed regulations for the lower left quadrant of risks would likely provoke charges from the public that any laws developed from such risk assessment might infringe on personal freedoms.

A good follow-up to the issue of perceived risk is the video produced

by ABC Television, *Are We Scaring Americans To Death?*

References

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APPENDIX A
Perceived Risk Data Sheet

A	"Hazard"	B	C	D
_____	AEROSOL SPRAY CANS	_____	_____	_____
_____	ALCOHOLIC BEVERAGES	_____	_____	_____
_____	ANTIBIOTICS	_____	_____	_____
_____	AVIATION (COMMERCIAL)	_____	_____	_____
_____	BICYCLES	_____	_____	_____
_____	ELECTRICAL POWER	_____	_____	_____
_____	FOOD PRESERVATIVES	_____	_____	_____
_____	FOOD COLORING	_____	_____	_____
_____	HANDGUNS	_____	_____	_____
_____	HIGH SCHOOL FOOTBALL	_____	_____	_____
_____	MOTOR VEHICLES	_____	_____	_____
_____	MOTORCYCLES	_____	_____	_____
_____	NUCLEAR POWER	_____	_____	_____
_____	ORAL CONTRACEPTIVES	_____	_____	_____
_____	PESTICIDES	_____	_____	_____
_____	POWER MOWERS	_____	_____	_____
_____	SMOKING	_____	_____	_____
_____	SURGERY	_____	_____	_____
_____	VACCINATIONS	_____	_____	_____
_____	X-RAYS	_____	_____	_____