

Risk Assessment & Risk Reduction in Environmental Policy

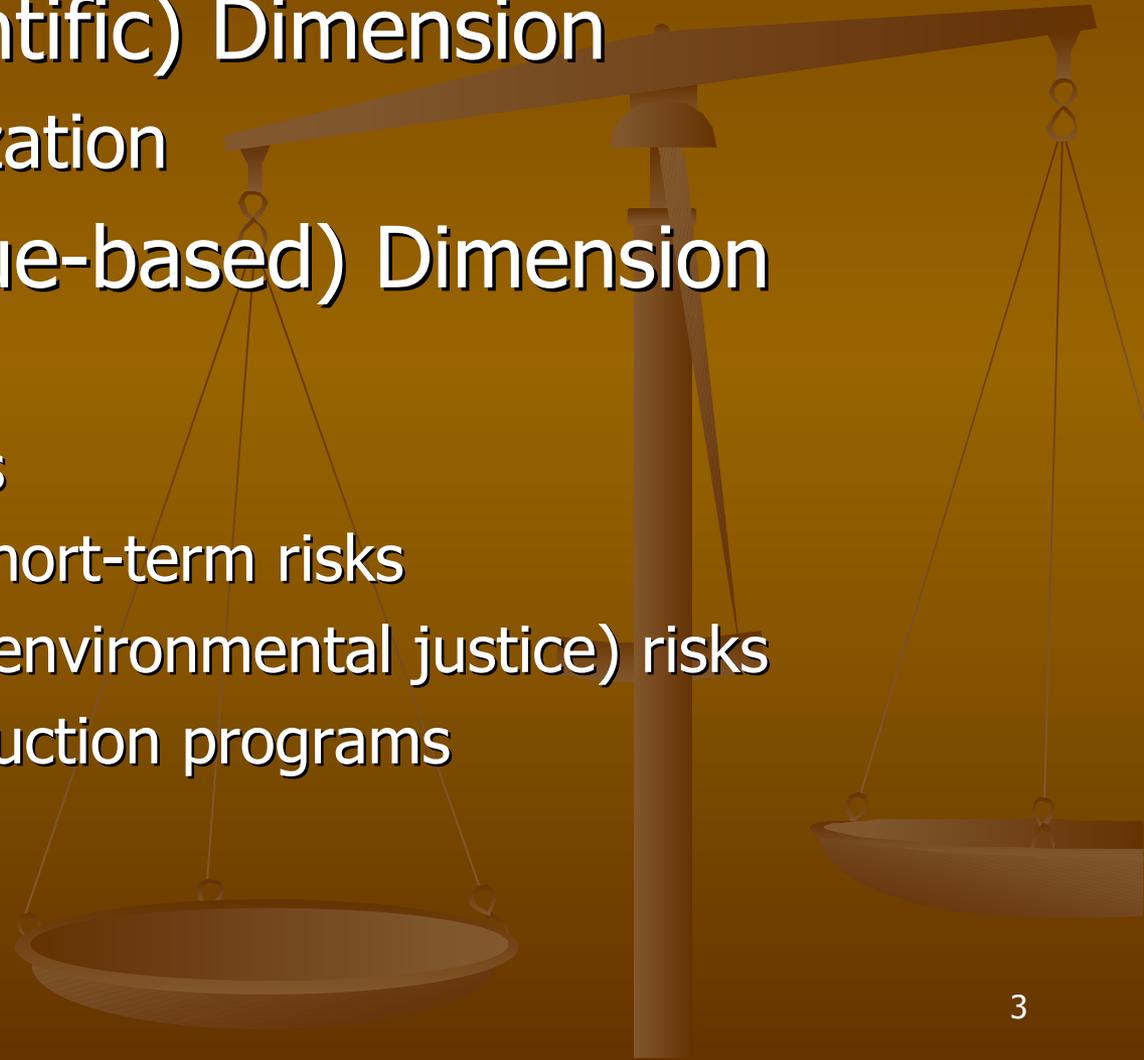


Risk in Environmental Policy

- The likelihood of an adverse outcome
 - To human health
 - To ecological health (?)
- Risk reduction priorities
- Risk tradeoffs & Risk-balancing
 - Everything we do carries some risk
 - Case of chlorinated water [Putnam, et al.]
- Risk-based statutes & regulations
 - E.O 12866 [Clinton 1993]

Risk Assessment & Analysis

- Objective (Scientific) Dimension
 - Risk characterization
- Subjective (Value-based) Dimension
 - What to do?
 - Uncertain Risks
 - Long-term v. short-term risks
 - Distributional (environmental justice) risks
 - Costly Risk reduction programs

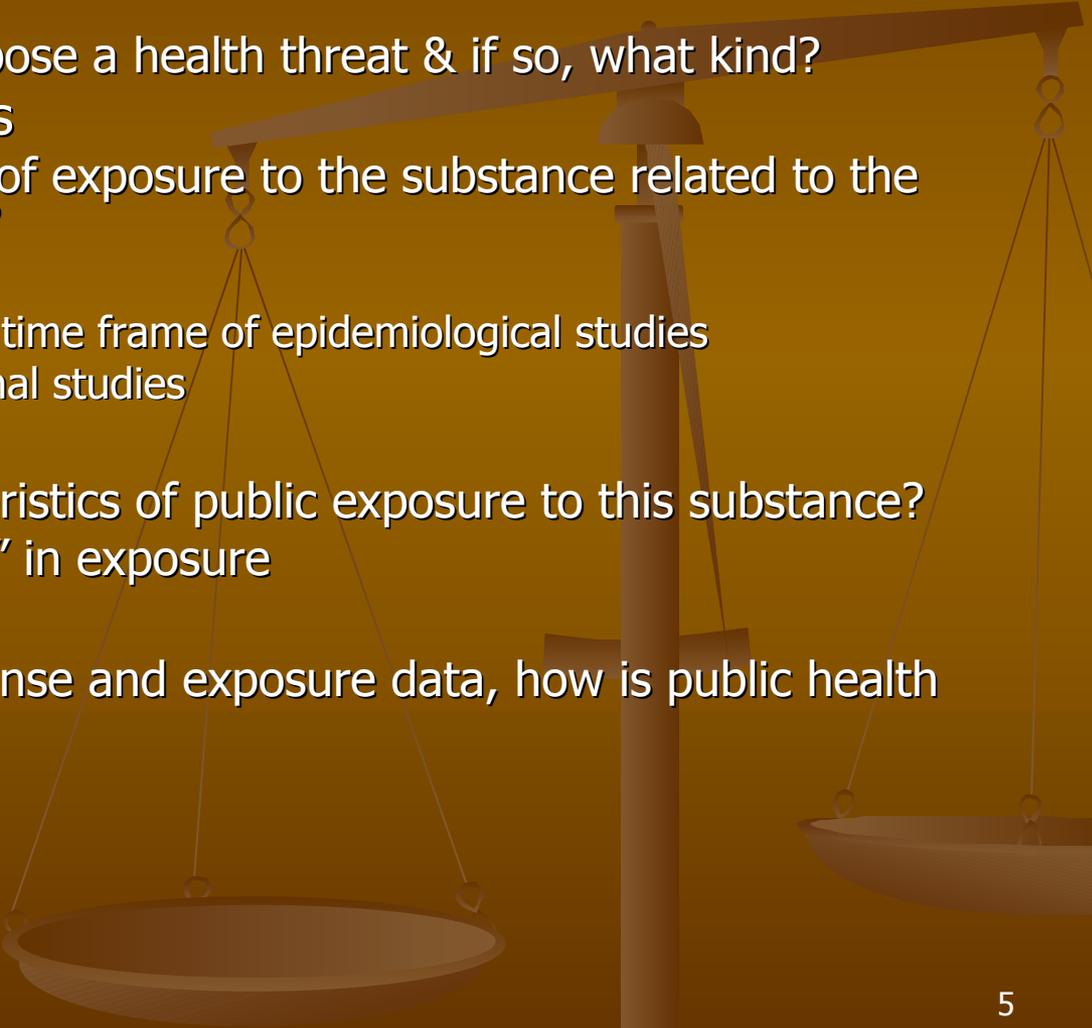


Defining Characteristics of “Environmental” Risk

- The probability of an adverse outcome
- Type & severity of adverse outcome
- The size of the exposed population
- Certainty of risk estimates
- Timing of adverse outcomes
- Distribution of adverse outcomes

Source: John D. Graham & Jonathan Bert Wiener (1995) *Risk vs. Risk* (Cambridge, MA: Harvard University Press)

Scientific Dimension of Risk Assessment



1. Hazard Identification

- Could this substance pose a health threat & if so, what kind?

2. Dose-Response Analysis

- How does the degree of exposure to the substance related to the degree of toxic effect?
- Missing data problem
 - Uncertainties & long time frame of epidemiological studies
 - Uncertainties of animal studies

3. Exposure Assessment

- What are the characteristics of public exposure to this substance?
- Social/cultural "biases" in exposure

4. Risk Characterization

- Combining dose-response and exposure data, how is public health affected?

Subjective Dimension of Risk Assessment

- What is “Sound” Science?
 - How much science do we need to make the “right” decision?
 - Who should bear the regulatory burden until we have “enough information?”
- Risk Philosophy
 - Precautionary Principle: Assume toxicity until proven safe.
 - If in doubt, then regulate.
 - Business bears the burden
 - Free Market Principle: Assume it is safe until a hazard is identified.
 - If in doubt, do not regulate.
 - Public bears the burden

Subjective Dimension of Risk Assessment

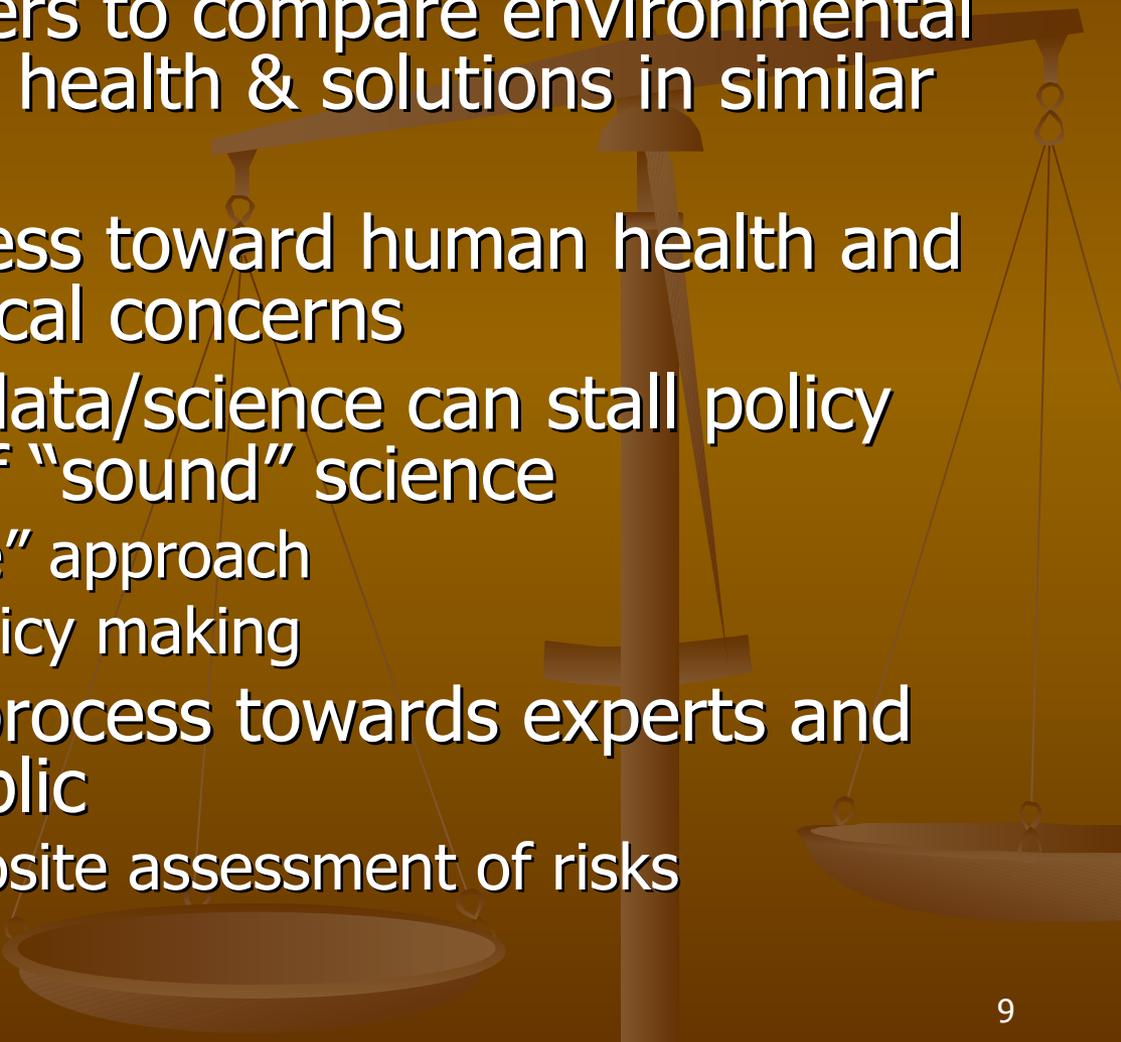
- Risk Reduction Priorities
 - Natural vs. human-induced risks
 - Geographic, social, and class-biased risk burdens
 - Immediate vs. long-term risks
 - Certain vs. uncertain risks
- What is “Acceptable” Risk?
 - EPA: 4000 additional lifetime deaths from arsenic-induced cancer

Risk Tradeoffs

Compared to Target Risk, the Countervailing Risk Affects:	Compared to Target Risk, the Countervailing Risk is:	
	SAME TYPE	DIFFERENT TYPE
SAME POPULATION	Risk Offset	Risk Substitution
DIFFERENT POPULATION	Risk Transfer	Risk Transformation

Source: John D. Graham & Jonathan Bert Wiener (1995) *Risk vs. Risk* (Cambridge, MA: Harvard University Press)

Policy Impact of Risk Emphasis



- Forces policy makers to compare environmental dangers to human health & solutions in similar terms
- Biases policy process toward human health and away from ecological concerns
- Delays in getting data/science can stall policy making in name of “sound” science
 - Favors “wait & see” approach
 - crisis-triggered policy making
- Biases the policy process towards experts and away from the public
 - Tend to have opposite assessment of risks



Perceptions of Risk

Which Matters More: Science or
Politics?

“Chemicals in the Environment Pose and Increasing Risk to Society”

	Liberal	Moderate	Conservative
Agree	15	31	14
Disagree	1	18	19

Source: Nevin Cohen (1997) “The Politics of Environmental Risk,” *Policy Studies Journal*, Vol. 25, No. 3, pp. 470-484.

“Animal Models are a Valid Method for Assessing Risk”



	Liberal	Moderate	Conservative
Agree	9	20	12
Disagree	4	21	24

Source: Nevin Cohen (1997) “The Politics of Environmental Risk,” *Policy Studies Journal*, Vol. 25, No. 3, pp. 470-484.

“Racial Minorities Face More Environmental Risks”



	Liberal	Moderate	Conservative
Agree	13	26	9
Disagree	3	15	24

Source: Nevin Cohen (1997) “The Politics of Environmental Risk,” *Policy Studies Journal*, Vol. 25, No. 3, pp. 470-484.

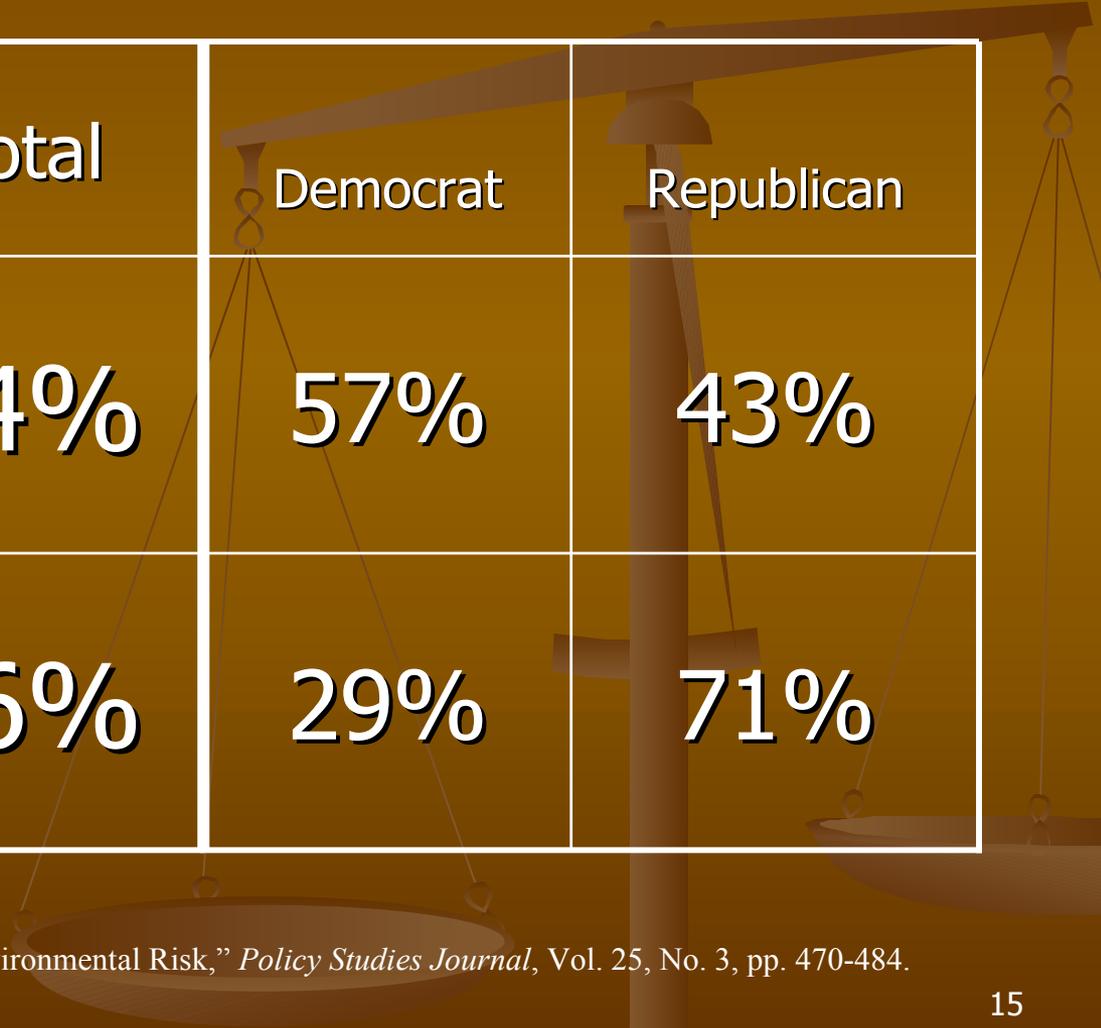
“Risk assessment results are more believable than conclusions reached by local residents”

	Total
Agree	74%
Disagree	17%

- No differences between parties or by gender

Source: Nevin Cohen (1997) “The Politics of Environmental Risk,” *Policy Studies Journal*, Vol. 25, No. 3, pp. 470-484.

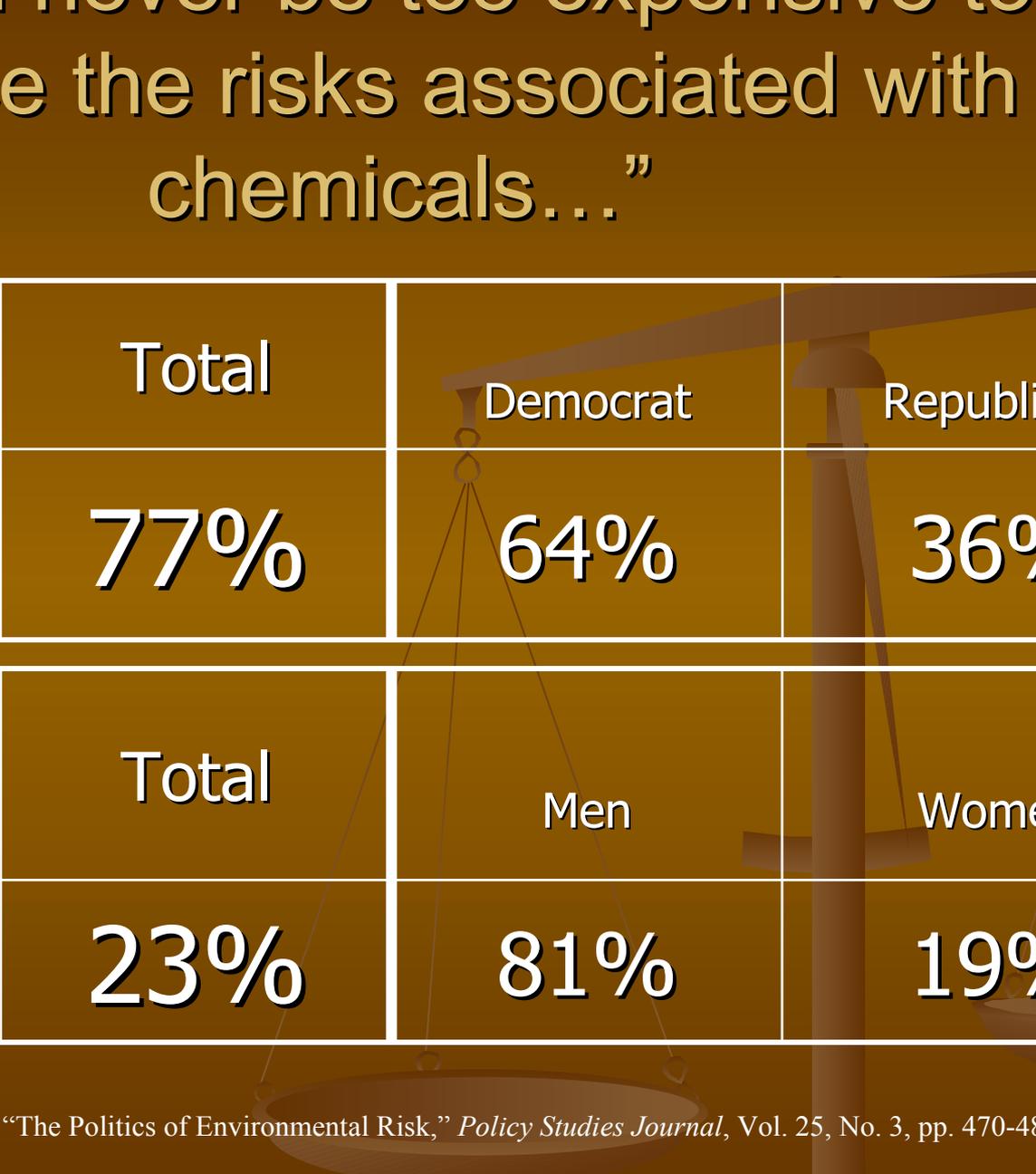
“Decisions about siting a HWF should be made primarily based on neighbors’ concerns, not risk numbers...”



	Total	Democrat	Republican
Agree	74%	57%	43%
Disagree	26%	29%	71%

Source: Nevin Cohen (1997) “The Politics of Environmental Risk,” *Policy Studies Journal*, Vol. 25, No. 3, pp. 470-484.

“It can never be too expensive to reduce the risks associated with chemicals...”



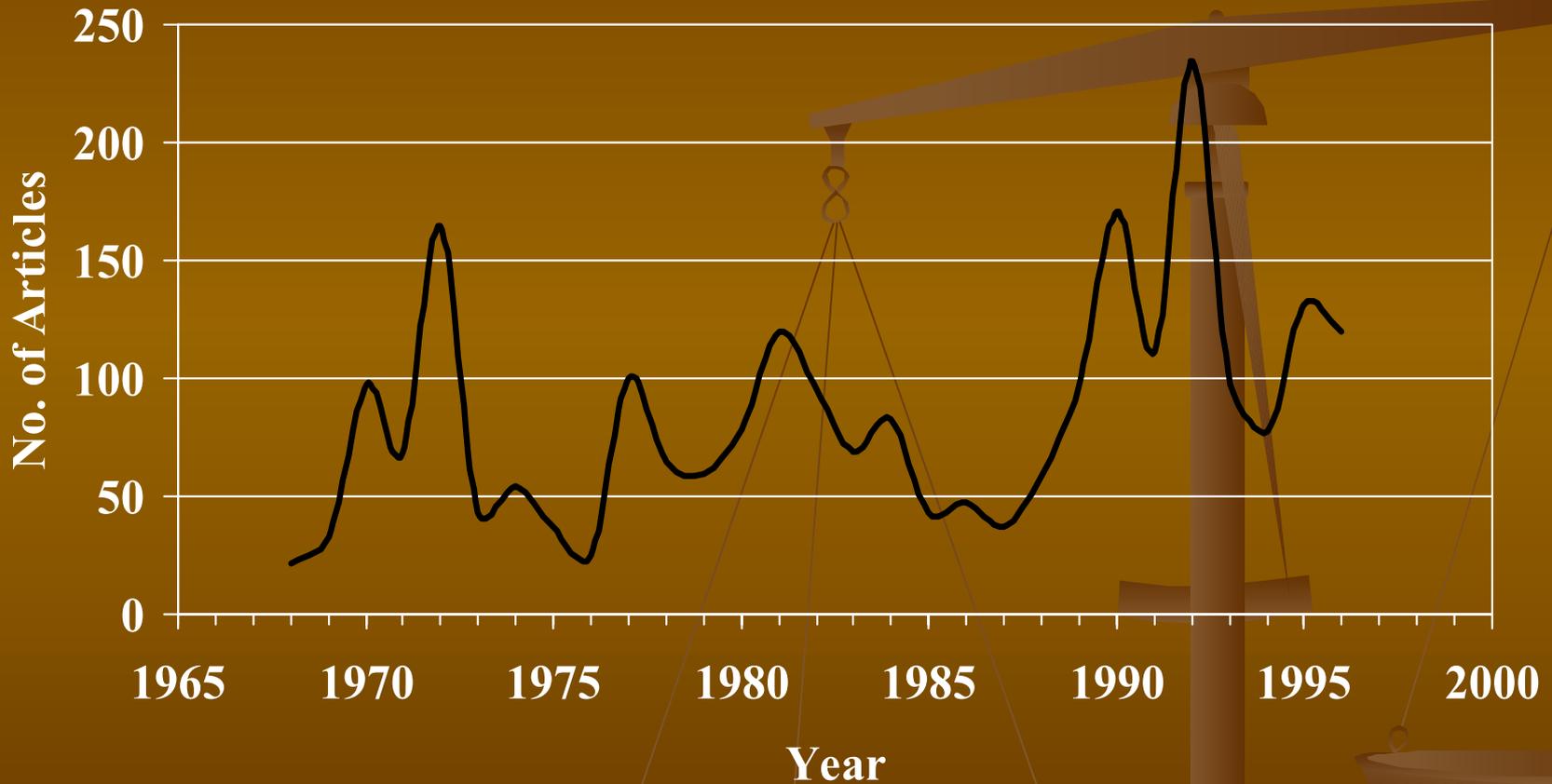
	Total	Democrat	Republican
Agree	77%	64%	36%

	Total	Men	Women
Disagree	23%	81%	19%

Source: Nevin Cohen (1997) “The Politics of Environmental Risk,” *Policy Studies Journal*, Vol. 25, No. 3, pp. 470-484.

Environmental Coverage

NYT Index



Source: Ronald Shaiko (1999) *Voices and Echoes for the Environment*, (NY: Columbia University Press), p. 36.