

Generic Lessons About Public Acceptance of New Technologies

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THREE KEY POINTS:

- **LIKELIHOOD OF ACCEPTANCE OF ANY NEW TECHNOLOGY (INNOVATION)—IS EXTREMELY SMALL.**
- **THERE ARE COMMONALITIES BETWEEN ACCEPTANCE OF LARGE OR COMPLEX TECHNOLOGIES, THAT HAVE WIDE-SPREAD RISKS, AND SMALLER, MORE INDIVIDUALLY MATCHED TECHNOLOGIES.**
 - A. BASIC PSYCHOLOGICAL FACTORS**
 - B. VARIETY OF SOCIAL FACTORS**
- **THE GENERAL PERSPECTIVE FOR ANTICIPATING OR PROMOTING NEW TECHNOLOGIES, THE RATIONAL ACTOR PERSPECTIVE, IS OFTEN MISLEADING.**

- **WHAT ARE COMMONALITIES BETWEEN ACCEPTANCE OF LARGE OR COMPLEX TECHNOLOGIES, THAT HAVE WIDE-SPREAD RISKS, AND SMALLER, MORE INDIVIDUALLY MATCHED TECHNOLOGIES?**

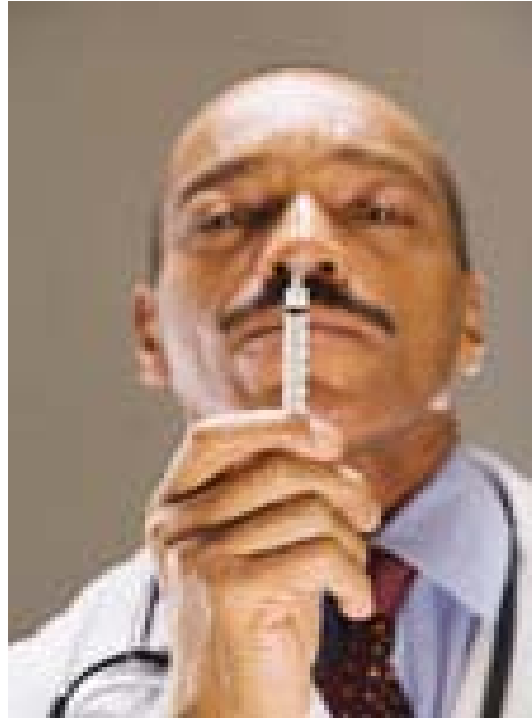
A. BASIC PSYCHOLOGICAL FACTORS

- 1. PSYCHOLOGICAL OVERLOAD**
- 2. FRAMING EFFECTS**

B. VARIETY OF SOCIAL FACTORS

- 1. INTERPERSONAL INFLUENCE**
- 2. SOCIAL STATUS**

HYPODERMIC NEEDLE MODEL OF TARGETED BEHAVIORAL CHANGE



**PROBLEM: PEOPLE OFTEN MAKE SUB-OPTIMAL DECISIONS
WHY? PEOPLE DON'T HAVE ACCURATE, RELEVANT INFORMATION**

**SOLUTION: A SHOT OF ACCURATE, MOTIVATING INFORMATION IS
SUFFICIENT TO PRODUCE DESIRED BEHAVIORAL CHANGE**

HYPODERMIC NEEDLE MODEL OF TARGETED BEHAVIORAL CHANGE

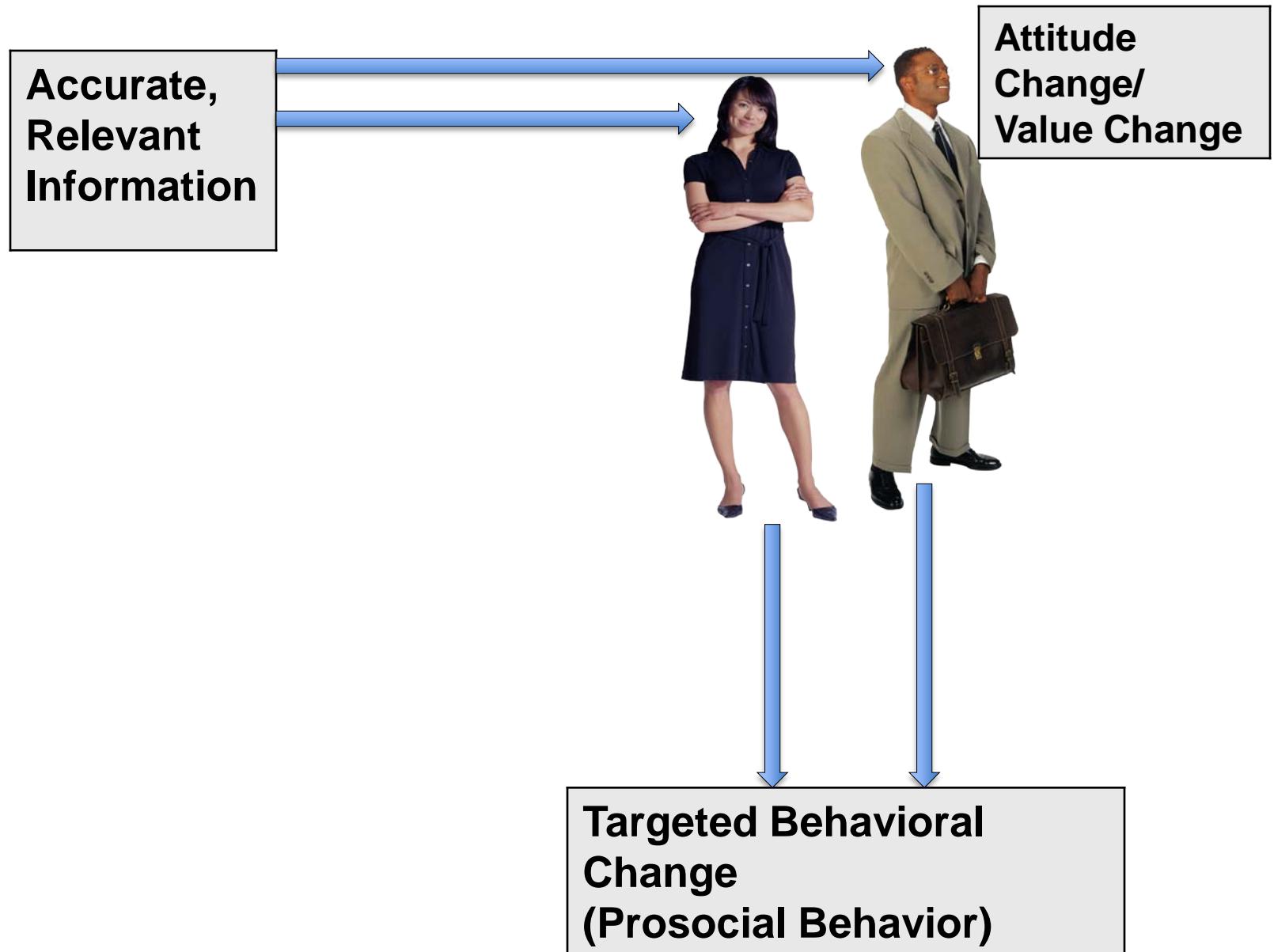


Table 2. Estimated percentage of total U.S. individual/household energy consumption that can be saved by 27 actions, by action type, 2005

Curtailment	Energy saved (percent)	Increased efficiency	Energy saved (percent)
Transportation			
Motor vehicle use			
Carpool to work with one other person	Up to 4.2	Buy a more fuel-efficient automobile (30.7 vs. 20 mpg EPA average-adjusted composite)	13.5
Alter driving (avoid sudden acceleration and stops)	Up to 3.2	Get frequent tune-ups, including air filter changes	3.9
Combine errand trips to one-half of current mileage	Up to 2.7	Buy low-rolling resistance tires	1.5
Cut highway speed from 70 to 60 mph	Up to 2.4	Maintain correct tire pressure	1.2
Inside the home			
Heating and air conditioning			
Heat: Turn down thermostat from 72° F to 68° F during the day and to 65° F during the night	2.8	Heat: Install/upgrade attic insulation and ventilation ¹	Up to 5.0
A/C: Turn up thermostat from 73° F to 78° F	0.6	A/C: Install/upgrade attic insulation and ventilation ¹	Up to 2.0
Subtotal	3.4		Up to 7
		Heat: Install a more efficient heating unit (92 percent efficient)	2.9
		A/C: Install a more efficient A/C unit (SEER 13 or EER 12)	2.2
Subtotal			5.1
		Heat: Replace poor windows with high-efficiency windows	Up to 2.8
		A/C: Replace poor windows with high-efficiency windows	Up to 0.9
Subtotal			Up to 3.7
		Heat: Caulk/weather-strip home	Up to 1.9
		A/C: Caulk/weather-strip home	Up to 0.6
Subtotal			Up to 2.5
Space conditioning subtotal			Up to 18.3

Table 2, continued

Curtailment	Energy saved (percent)	Increased efficiency	Energy saved (percent)
Water heating			
Turn down water heater thermostat from 140° F to 120° F	0.7	Install a more efficient water heater (EFS .7 unit)	1.5
Lighting			
Do not leave one 60-watt bulb on all night	0.5	Replace 85 percent of all incandescent bulbs with equally bright compact fluorescent bulbs	4.0
Replace two 100-watt kitchen bulbs with 75-watt bulbs	0.3		
Refrigeration/freezing			
Turn up the refrigerator thermostat from 33° F to 38° F and the freezer thermostat from -5° F to 0° F	0.5	Install a more efficient unit (replace a 19-21.4 cubic feet top-freezer unit bought between 1993 and 2000 with a new Energy Star unit)	1.9
Clothes washing and drying			
Change washer temperature settings from hot wash, warm rinse to warm wash, cold rinse	1.2	Install a more efficient washer (replace a 2001 or older non-Energy Star washer with a new Energy Star unit)	1.1
Line-dry clothing (do not use dryer) 5 months of the year	1.1		
Color TV			
Watch 25 percent fewer hours of TV each day	0.6	Purchase (or trade in) 52" Projection HD TV instead of a 48" Plasma HD TV	1.3

¹ Roughly 80 percent of older homes are underinsulated, according to the U.S. Department of Energy. "Save Hundreds on Energy Costs," *Consumer Reports*, October 2007, 27.

NOTES: The potential savings listed in this table apply only to individuals and households that have not already taken the action. Adding up savings across actions can overestimate aggregate savings because of interactions between some actions. For example, the energy saved by caulking/weather-stripping a home will be less if a more fuel-efficient furnace is also installed. The estimates in the "Increased Efficiency" column assume that consumers replace old equipment when it wears out rather than discarding functioning equipment. If consumers replace equipment before the end of its useful life, part of the energy they save by using the more efficient equipment is cancelled out by the energy used to manufacture the new equipment. Data for electric heating elements, small appliances, and small motors could not be disaggregated for further analysis.

Please see *Environment's* Web site, www.environmentmagazine.org, for a description of calculation strategies and methods and a complete list of sources.

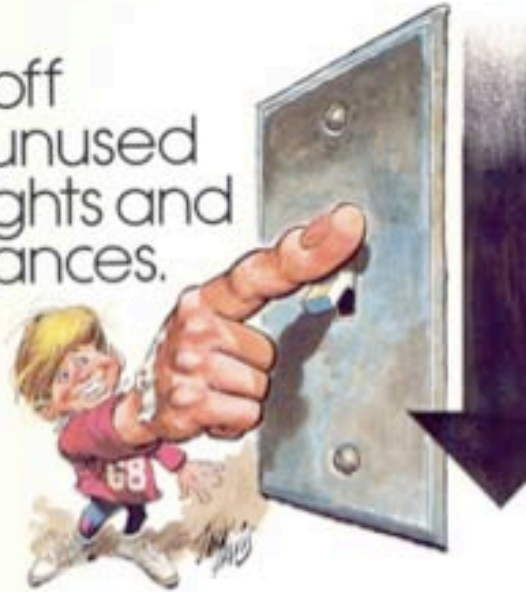


Hold your speed under 50.



Lower your thermostat to 68.

Turn off all unused lights and appliances.



DON'T BE FUELISH

OFFICE OF ENERGY CONSERVATION OF THE FEDERAL ENERGY OFFICE

THE FOUNDATION OF THE RATIONAL ACTOR PERSPECTIVE CONSISTS OF A HIERARCHY OF NORMATIVE EXPECTATIONS, INCLUDING:

- **TRANSITIVITY: AN OBVIOUS ONE THAT ASSUMES THAT IF $A > B$ AND $B > C$, THEN $A > C$**
- **INVARIANCE: THAT DIFFERENT REPRESENTATIONS OF THE SAME CHOICE PROBLEM SHOULD YIELD THE SAME ACTION PREFERENCE**

IN PRACTICE THESE AND EVERY OTHER EXPECTATION ARE VIOLATED

THE FRAMING OF CHOICE: AN EXAMPLE

IMAGINE THAT THE U.S. IS PREPARING FOR THE OUTBREAK OF AN UNUSUAL ASIAN DISEASE, WHICH IS EXPECTED TO KILL 600 PEOPLE.

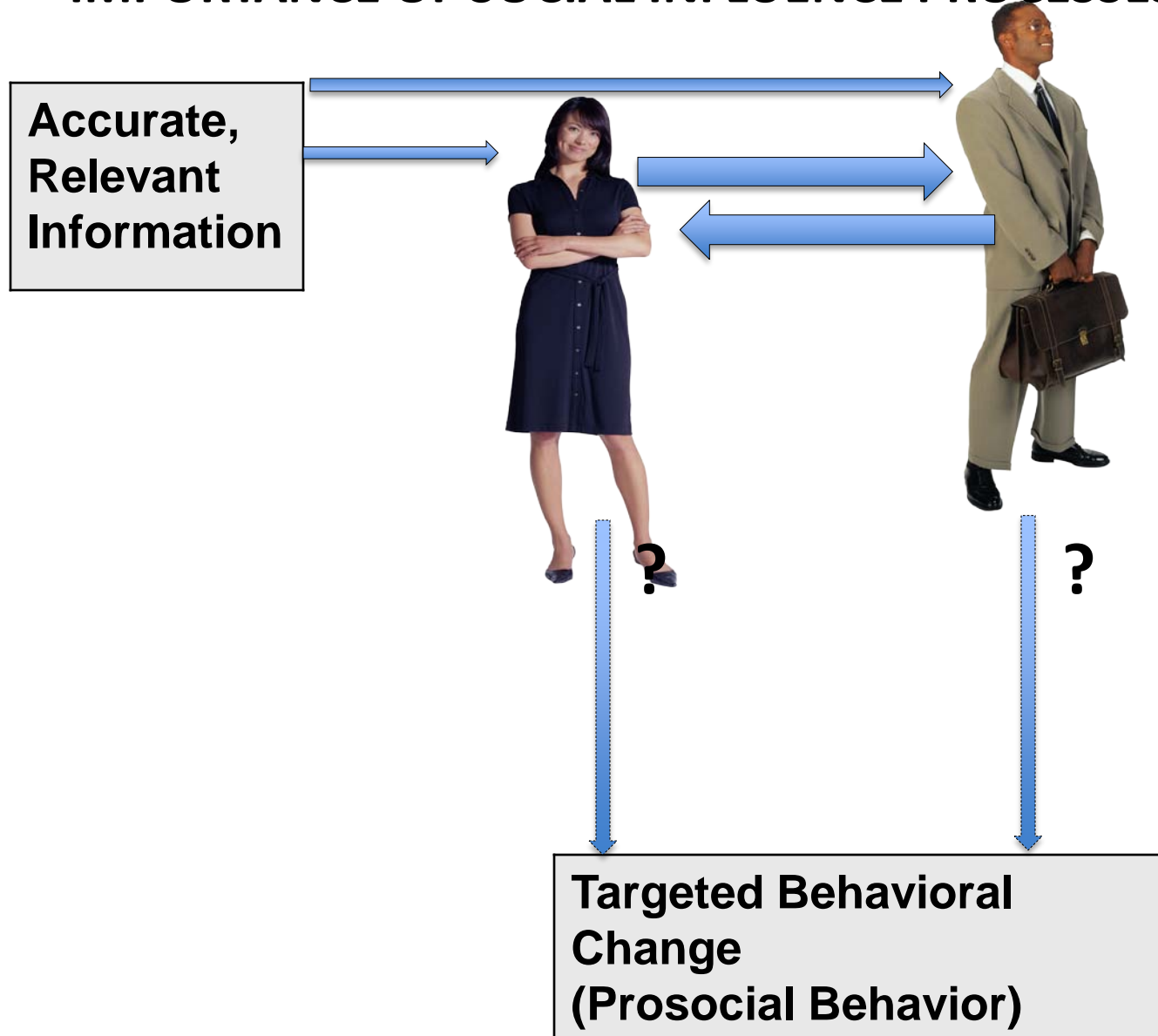
TWO ALTERNATIVE PROGRAMS TO COMBAT THE DISEASE HAVE BEEN PROPOSED. ASSUME THAT THE EXACT SCIENTIFIC ESTIMATE OF THE CONSEQUENCES OF THE PROGRAMS ARE AS FOLLOWS:

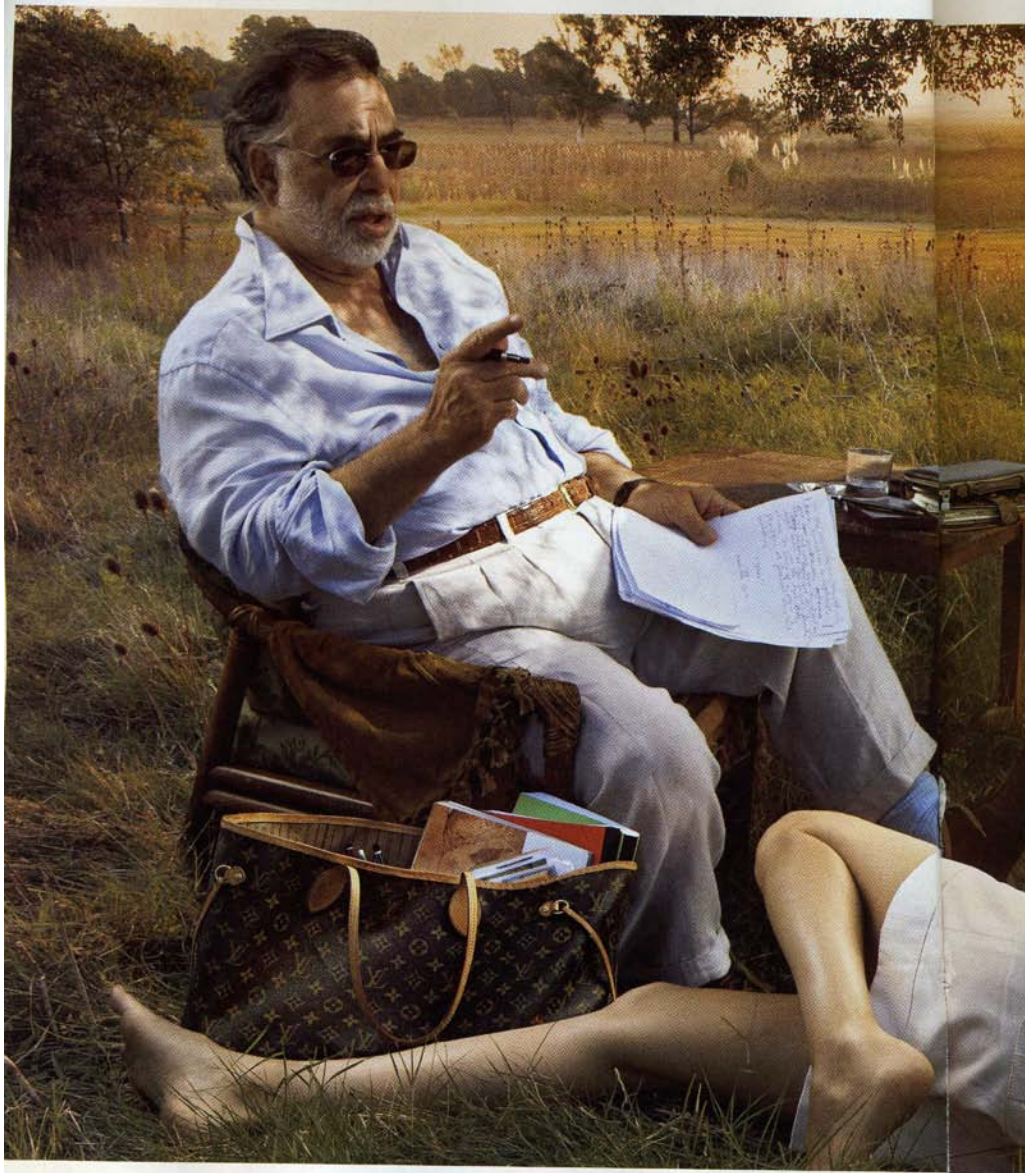
IF PROGRAM (A) IS ADOPTED 200 PEOPLE WILL BE SAVED.

IF PROGRAM (B) IS ADOPTED, THERE IS 1/3 PROBABILITY THAT 600 PEOPLE WILL BE SAVED, AND 2/3 PROBABILITY THAT NO PEOPLE BE SAVED.

WHICH OF THE TWO PROGRAMS WOULD YOU FAVOR?

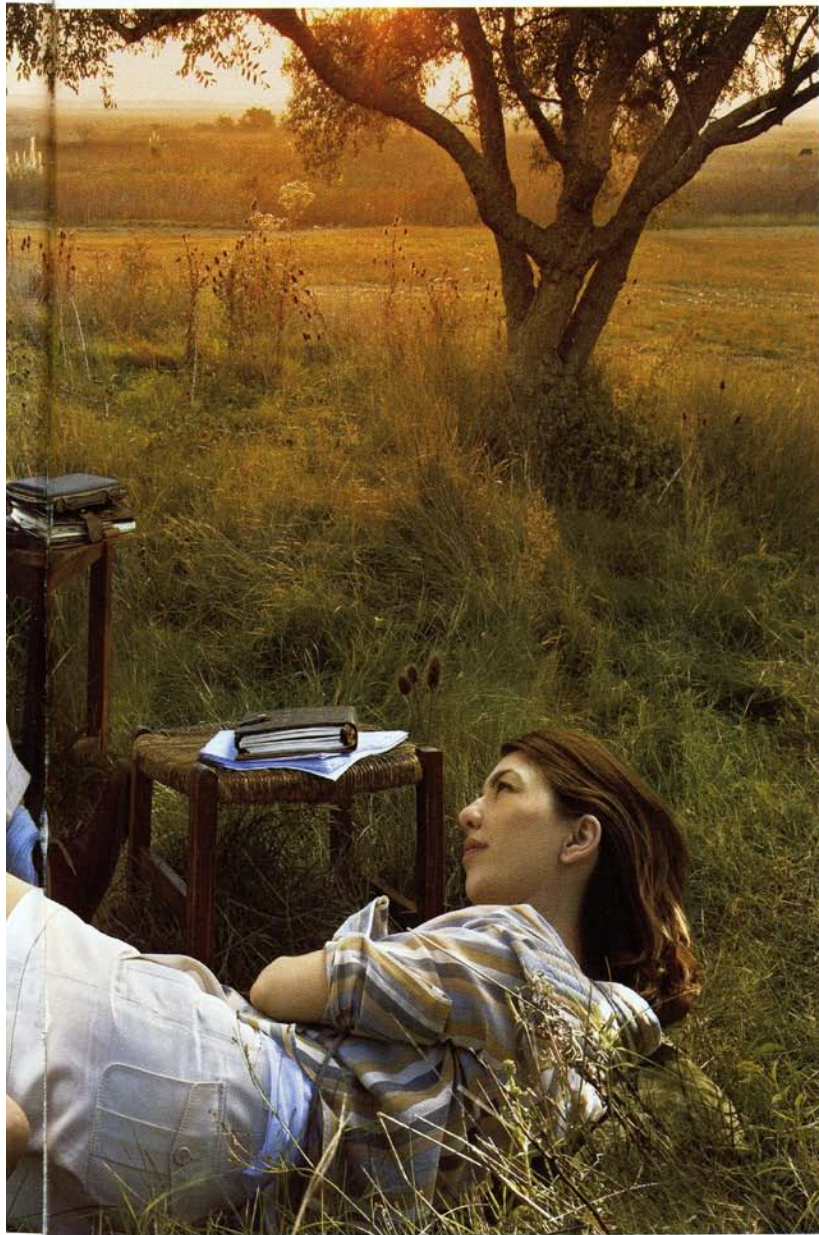
IMPORTANCE OF SOCIAL INFLUENCE PROCESSES





Inside every story, there is a beautiful journey. Early evening, Buenos Aires, Argentina.

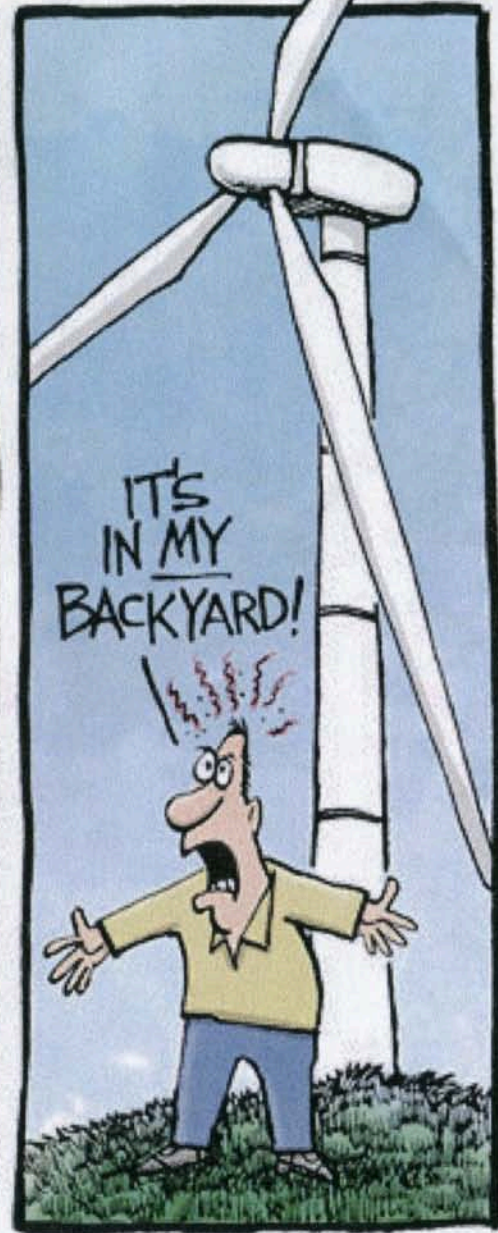
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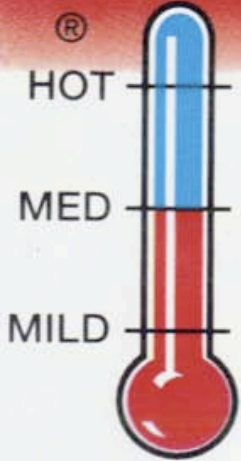
ARGUMENTS AGAINST -



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SINCE
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La Victoria®



SERVING
SUGGESTION

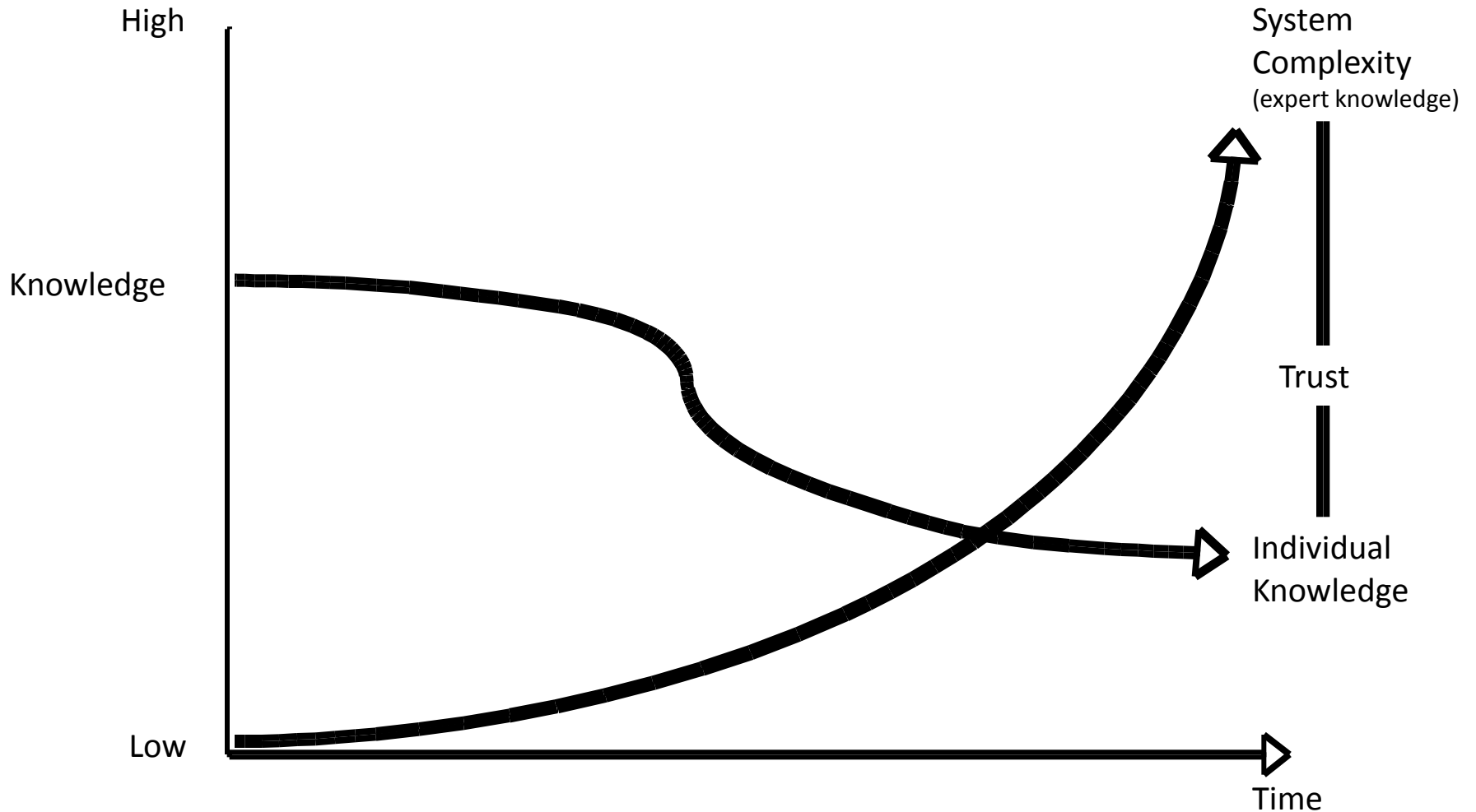


Red
TACO SAUCE

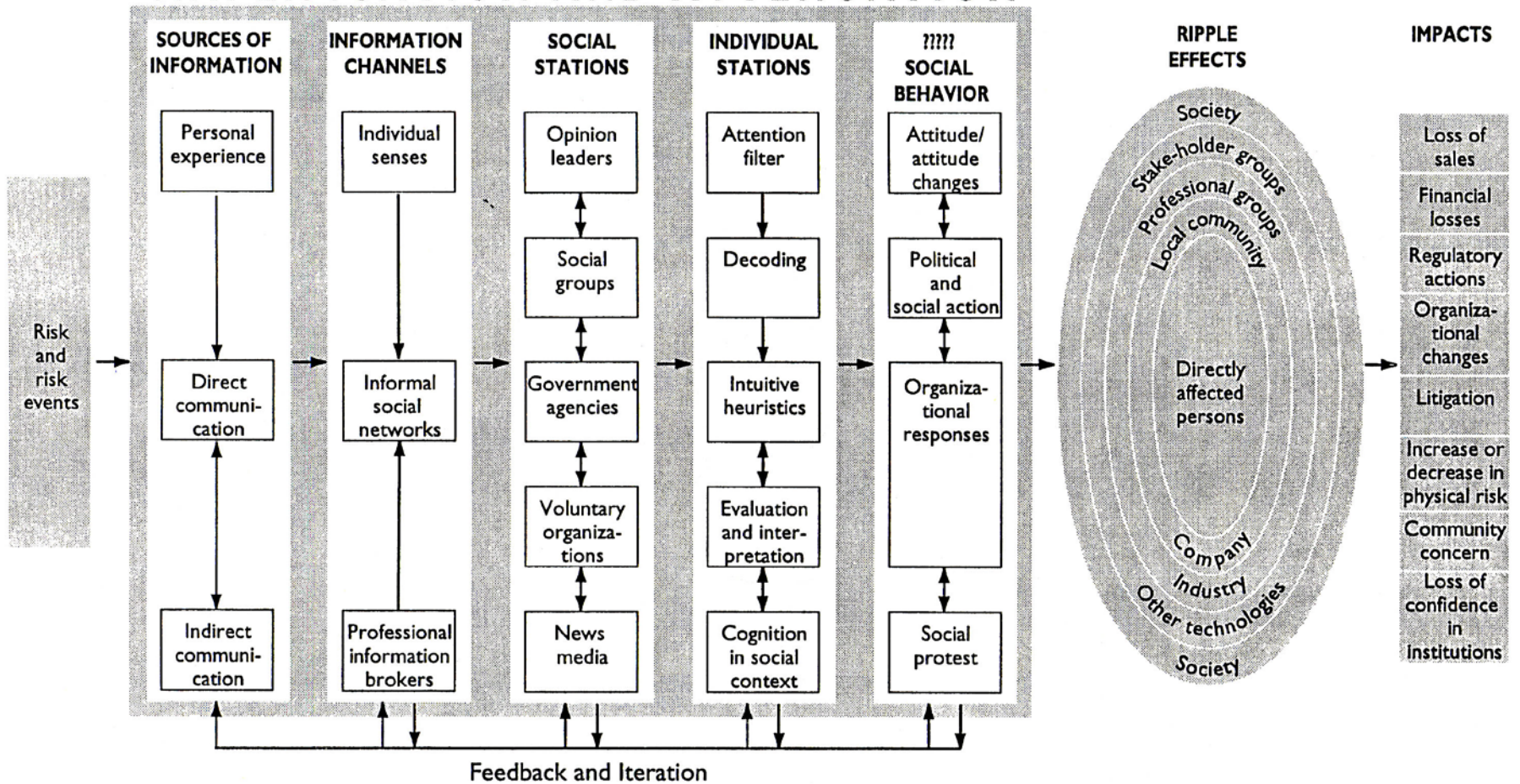
NET WT.
12 OZ.
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MEDIUM

Role of Trust in Divergence Between Technological Complexity and Individual Knowledge



AMPLIFICATION AND ATTENUATION



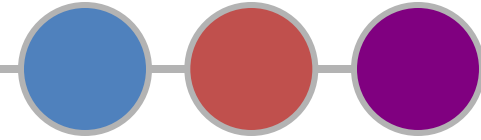
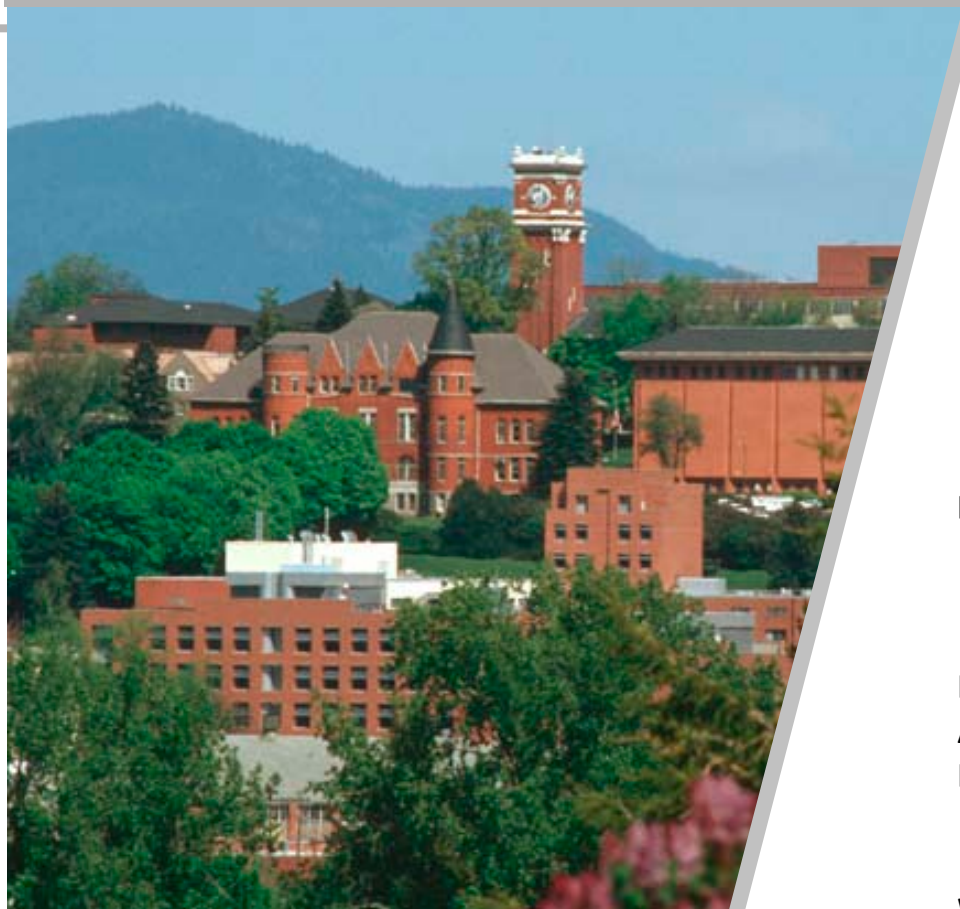
The Social Amplification of Risk Framework

Kasperson, Roger E, Ortwin Renn, et al. (1988), *Risk Analysis*.

Understanding **RISK**

*Informing
Decisions
in a
Democratic
Society*

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LIGHTING: FACTORS IN ADOPTING *CFL LIGHT BULBS

BENEFITS:

ECONOMICS: ENERGY/COST SAVINGS (USE 75% LESS)

ECOLOGY: REDUCE CO² EMISSIONS

BARRIERS:

COMFORT: LONG WARM UP TIME
BUZZING NOISE
POOR LUMINESENCE

COST: INITIAL COST IS HIGH
A. MUST UNDERSTAND LIFETIME

COSTING

B. MUST BE ABLE TO AFFORD

ECOLOGY: TOXIC CHEMICALS: MERCURY



***COMPACT FLUORESCENT
LIGHT BULBS**