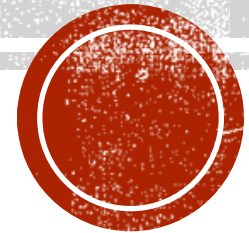


PSYCHOLOGY OF RISK PERCEPTION

Meghnaa Tallapragada, Ph.D



GMO INFORMATION & RELIANCE ON COGNITION

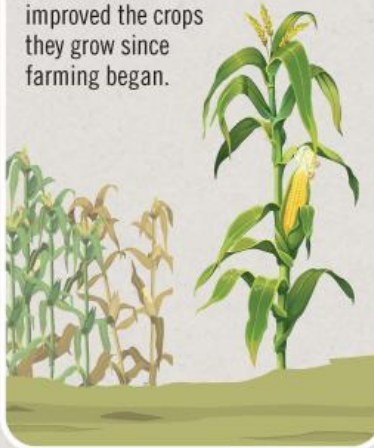
What Is a GMO?

GMOs are the product of a specific type of plant breeding where precise changes are made to a plant's DNA to give it characteristics that cannot be achieved through traditional plant breeding methods.



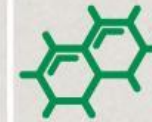
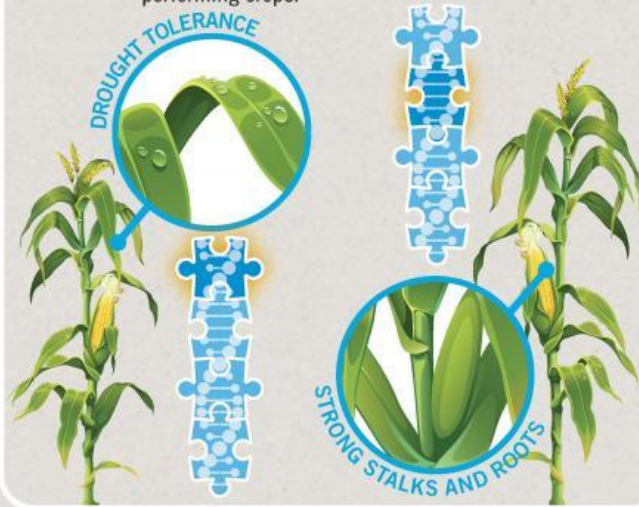
SELECTIVE BREEDING

Plant breeders look for, select and cross-breed the best performing plants in the field, similar to how farmers have naturally improved the crops they grow since farming began.



ADVANCED BREEDING

Breeders identify and tag desirable characteristics (traits) within a plant genome. They use this information to pick which plants to cross-breed and create better performing crops.

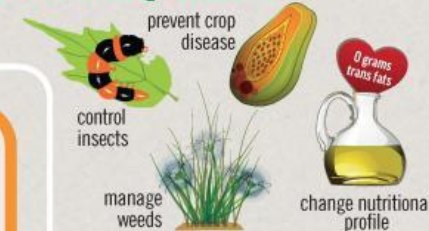


GM PLANT BREEDING

If a plant needs a trait that can't be achieved through advanced breeding, a gene can be turned off or moved, or a gene from another source can be inserted.



GMOs can help farmers ...



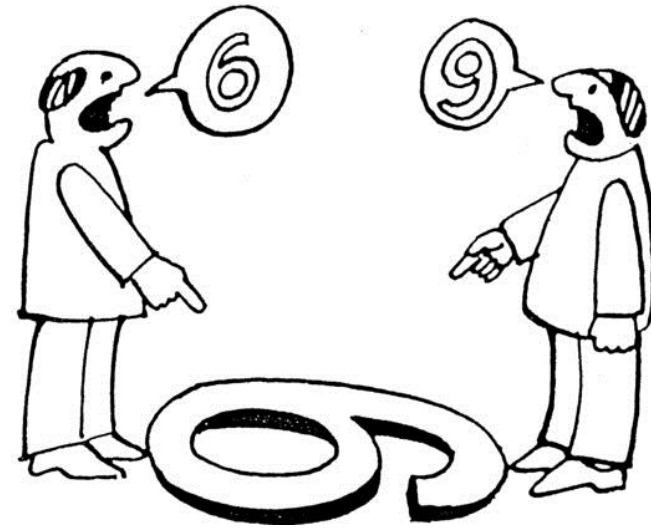
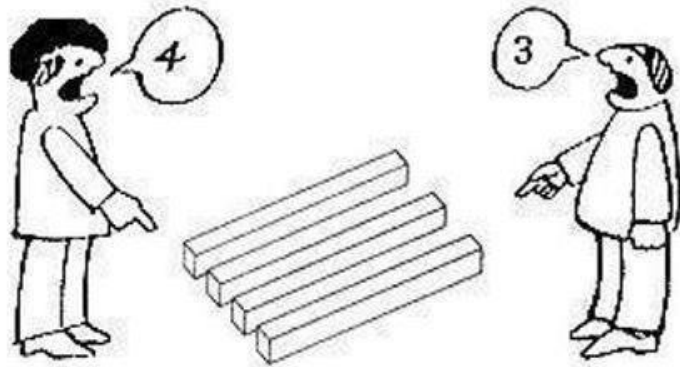
There are nine GMO crops available in the U.S. today with one more approved and coming to market soon



For more information, visit www.GMOAnswers.com



PERCEPTION

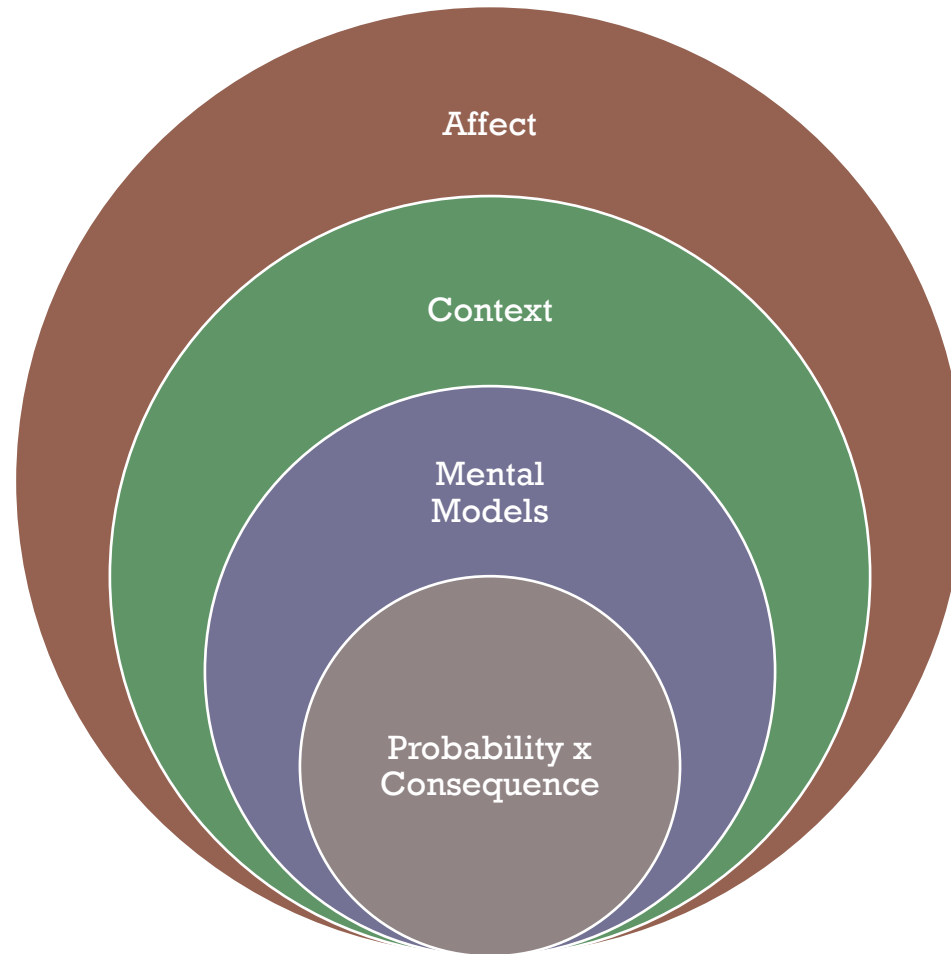


PROFESSIONAL ASSESSMENT OF RISK

Probability x
Consequence



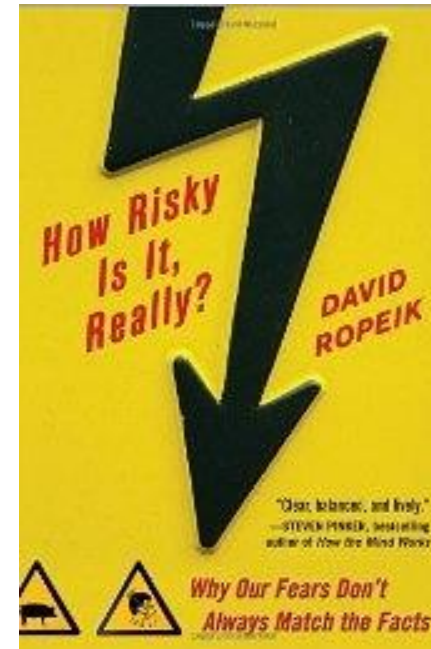
PUBLIC CONCEPTIONS OF RISK



RISK PERCEPTION

- “Risk perception is a mix of facts and feelings, intellect and instinct, reason and gut reaction.”

- David Ropeik



TWO COMPONENTS TO RISK PERCEPTION

- Cognitive components – thoughts

- Understanding of the likelihood/consequences of the hazard
- Mental models of how/why the particular hazard poses a threat
- Understanding of the contexts surrounding the hazard

- Affective components – feelings

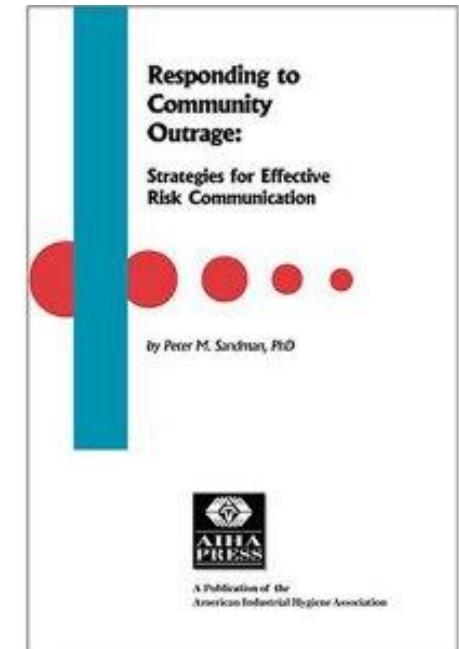
- Dread
- Outrage
- Fear
- Worry
- Frustration
- Sadness
- Anger
- Disgust
- Protectiveness
- Others. . .



TWO COMPONENTS TO RISK PERCEPTION

- **Cognitive components – thoughts**
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- **Affective components – feelings**
 - Dread
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 - Protectiveness
 - Others. . .



Risk = Hazard + Outrage



TWO COMPONENTS TO RISK PERCEPTION

■ Cognitive components – thoughts

- Understanding of the likelihood/consequences of the hazard
- Mental models of how/why the particular hazard poses a threat
- Understanding of the contexts surrounding the hazard

■ Affective components – feelings

- Dread
- Outrage
- Fear
- Worry
- Frustration
- Sadness
- Anger
- Disgust
- Protectiveness
- Others. . .

Risk = Thoughts about hazard + feelings about the hazard



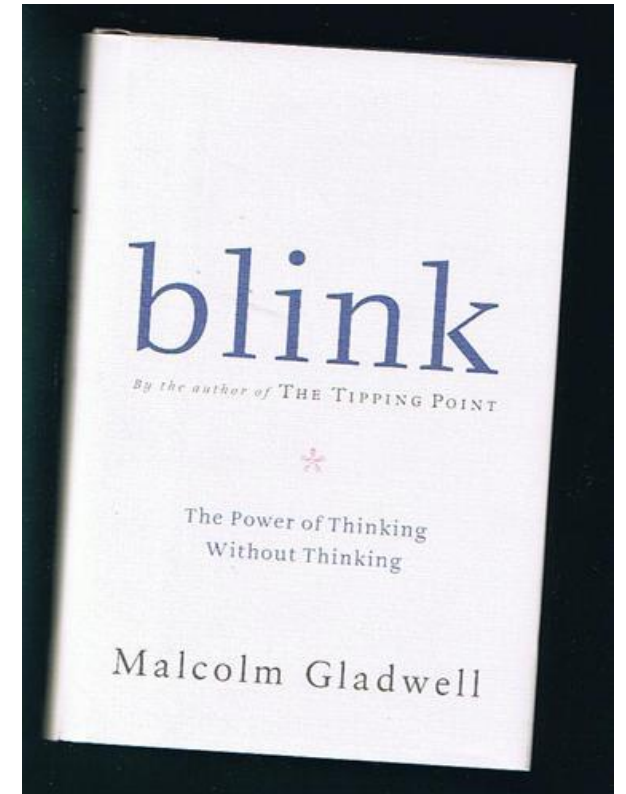
COGNITION AND AFFECT

- Many psychologists (and especially economists) who incorporate affect into their theories of risk and decisions believe that affect is the byproduct of cognition.
- People evaluate the information they are given, which leads to an overall affective reaction (i.e. fear, anger, dread, outrage).



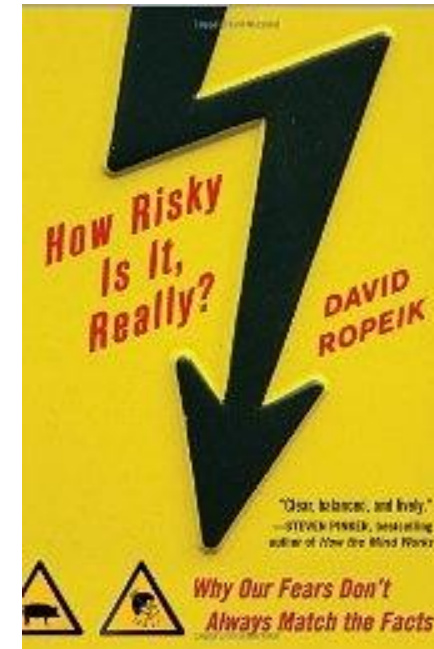
COGNITION AND AFFECT

- However, research suggests that people have a remarkably poor understanding of what influences their perceptions and behaviors.
- They can't say
 - Why they feel the way they do.
 - Why they made a particular choice.
 - Why they act the way they do.



RISK PERCEPTION

“The feelings/instinct/gut have the greater influence.”
- David Ropeik

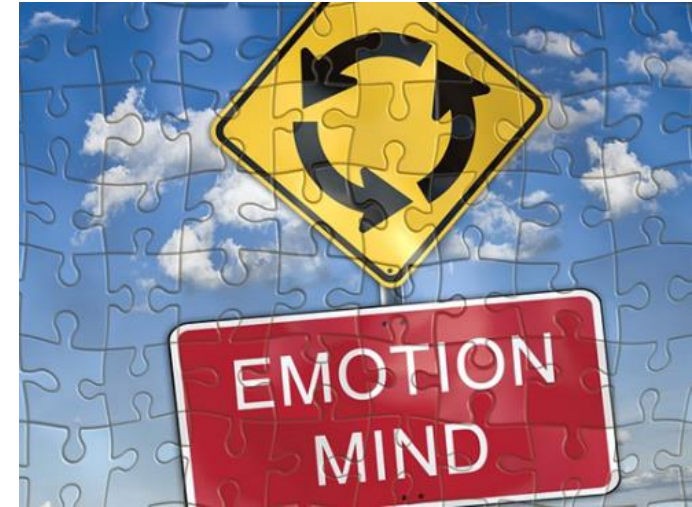


Activist's Messages Often Rely on Affect



AFFECT CAN COME FIRST

- It seems clear that affect can also drive future cognition.
 - First impressions matter.
 - “Curb appeal”
 - Cyclical thinking
 - I like it because it is good, and it is good because I like it.



Murray Hill House Before



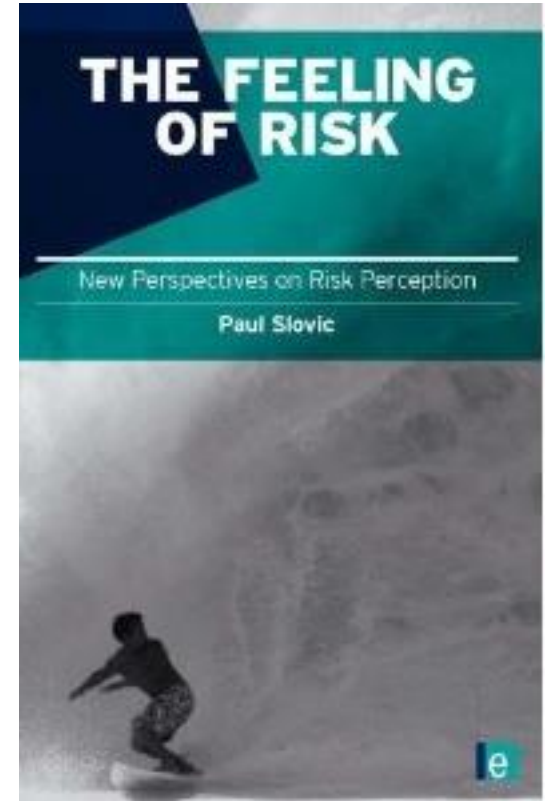
Murray Hill House After

<http://www.bradofficer.com/curb-appeal-crucial-jacksonville-real-estate-market/>



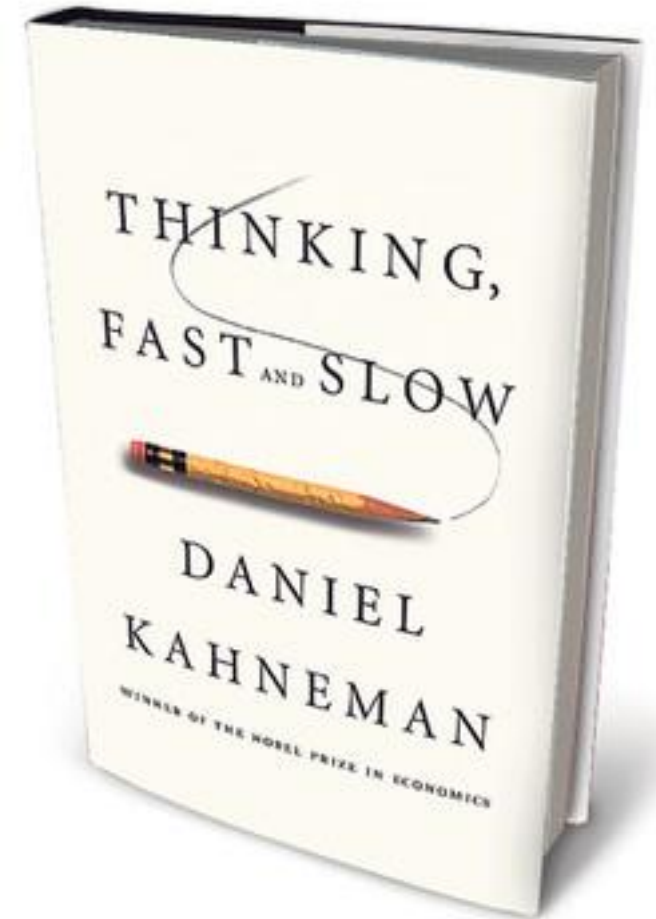
RISK AS FEELINGS

- Affect (feelings) influences:
 - Judge risks
 - Make decisions
- Information “conveys positive and negative feelings”
 - Finucane et al. - the “**affect heuristic**”



HEURISTICS

- Mental or judgment shortcuts
 - Anchoring: reliance on first piece of information to “anchor”
 - Condition 1: $1 \times 2 \times 3 \times 4 \times 5 \times 6 \times 7 \times 8$
 - Median estimate: 512
 - Condition 2: $8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$
 - Median estimate: 2250
 - Peak-end rule: remember the peak moment and the end moment



“Safe”

- Voluntary
- Individually controlled
- Exposure can be perceived
- Familiar
- Natural
- Not dreaded
- Not memorable
- Consequences obscure
- Chronic
- Consequences delayed
- Consequences reversible
- No risk to future generations
- Known to experts
- Fair
- No alternatives
- Morally irrelevant
- Anonymous victims
- Unable to blame someone
- Trustworthy sources
- Responsive process

“Risky”

Coerced
Controlled by others
Exposure is invisible
Exotic
Industrial
Dreaded
Memorable
Can imagine consequences
Catastrophic
Consequences immediate
Irreversible consequences
Risk to future generations
Unknown
Unfair
Alternatives available
Morally relevant
Can empathize with victims
Able to blame someone
Untrustworthy sources
Unresponsive process



ASSESSING RISK: AFFECT

- Voluntariness
- Control
- Perceptibility of Exposure



ASSESSING RISK: AFFECT

- Familiarity



ASSESSING RISK: AFFECT

- Natural or Industrial?



ASSESSING RISK: AFFECT

- Purposeful or accidental?



ASSESSING RISK: AFFECT

- Dreadfulness of the Consequences



ASSESSING RISK: AFFECT

- Risk to Future Generations



ASSESSING RISK: AFFECT

Known to experts

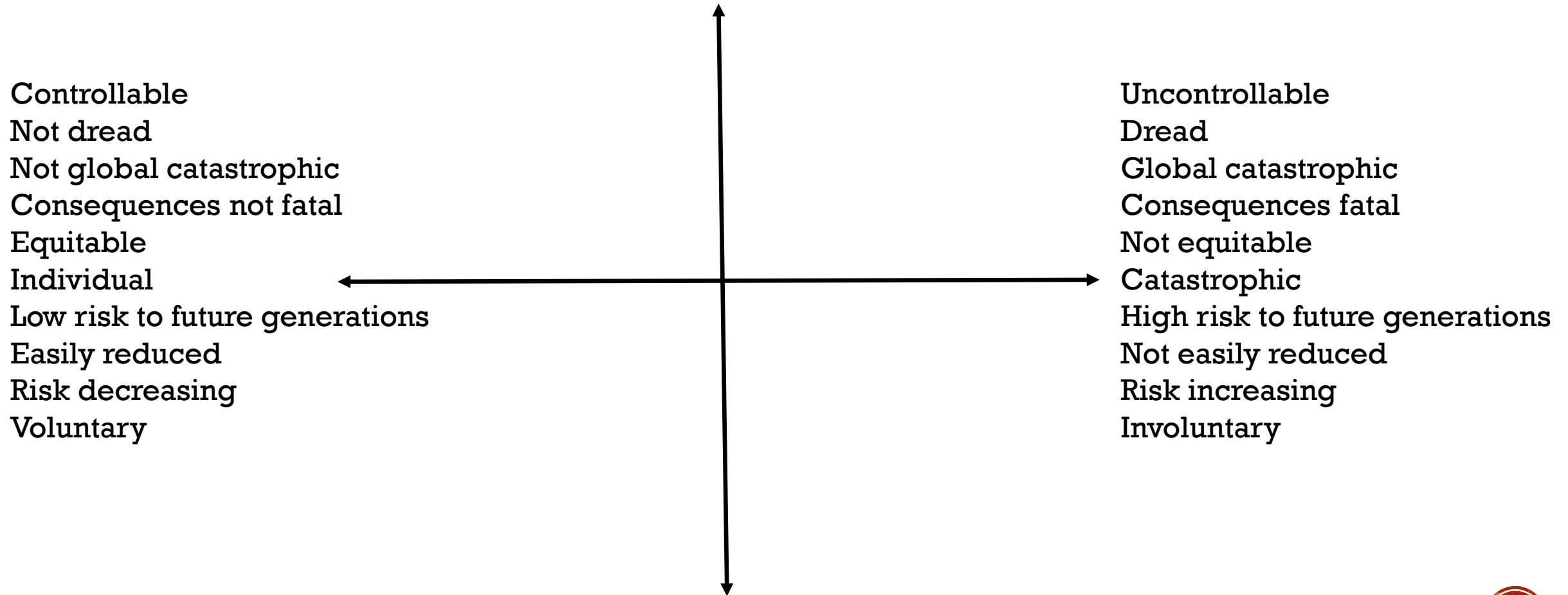


Moral dimensions

Can empathize with victims



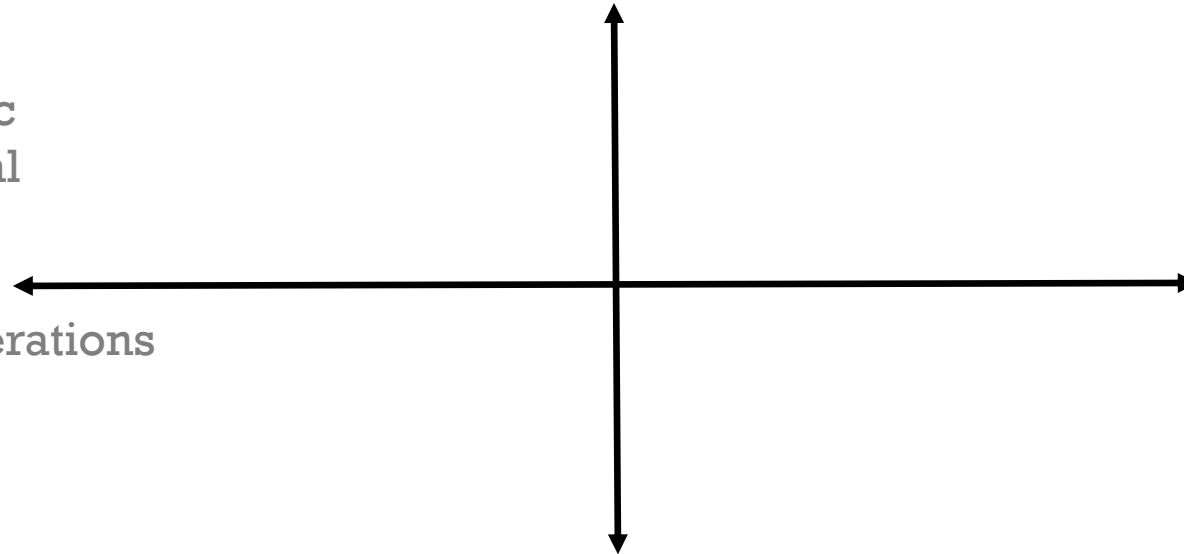
PSYCHOMETRIC MODEL OF RISK PERCEPTION



PSYCHOMETRIC MODEL OF RISK PERCEPTION

Not observable
Unknown to those exposed
Effect delayed
New risk
Risks unknown to science

Controllable
Not dread
Not global catastrophic
Consequences not fatal
Equitable
Individual
Low risk to future generations
Easily reduced
Risk decreasing
Voluntary

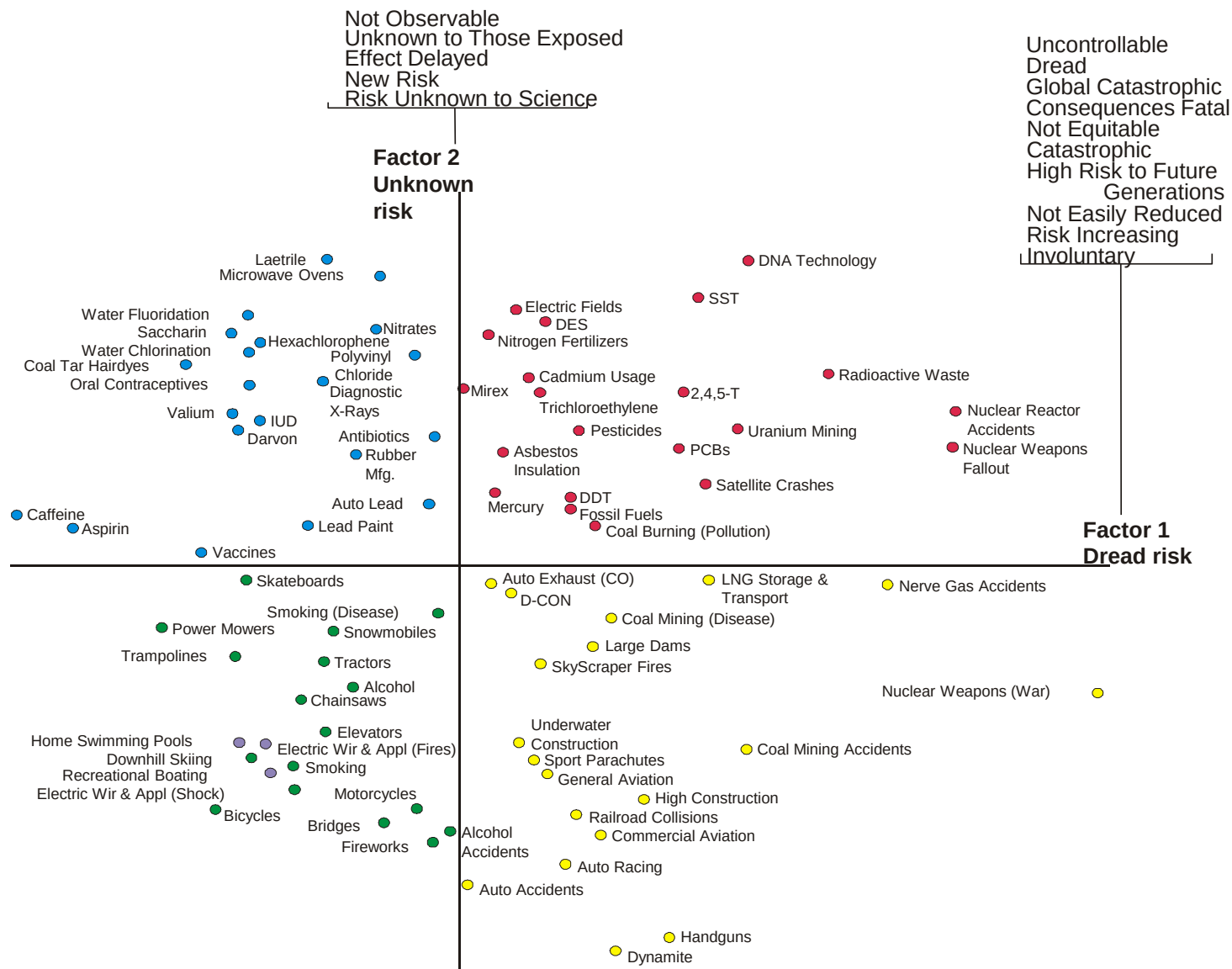


Uncontrollable
Dread
Global catastrophic
Consequences fatal
Not equitable
Catastrophic
High risk to future generations
Not easily reduced
Risk increasing
Involuntary

Observable
Known to those exposed
Effect immediate
Old risk
Risks known to science



PSYCHOMETRIC MODEL OF RISK PERCEPTION



Adapted from:

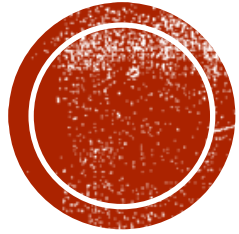
[Slovic, P. \(1987\). Perception of risk. Science, 236, 280-285.](#)



REMEMBER!

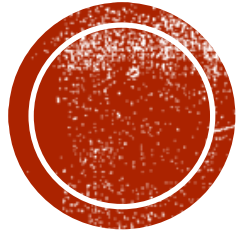
- Risk: Cognitive & Affective components
- Research on Risk Perceptions
 - History: Chauncey Starr (1969)
 - Heuristics
 - Models: Outrage model and Psychometric model
- Understand risk perception because:
 - Anticipate public responses to risks
 - Improve risk communication to publics





HOW IS RISK PERCEIVED IN YOUR SPECIFIC RESEARCH/REGULATORY FOCUS?

This week, take perspective.



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