

# Appraisals and emotions in climate change perceptions

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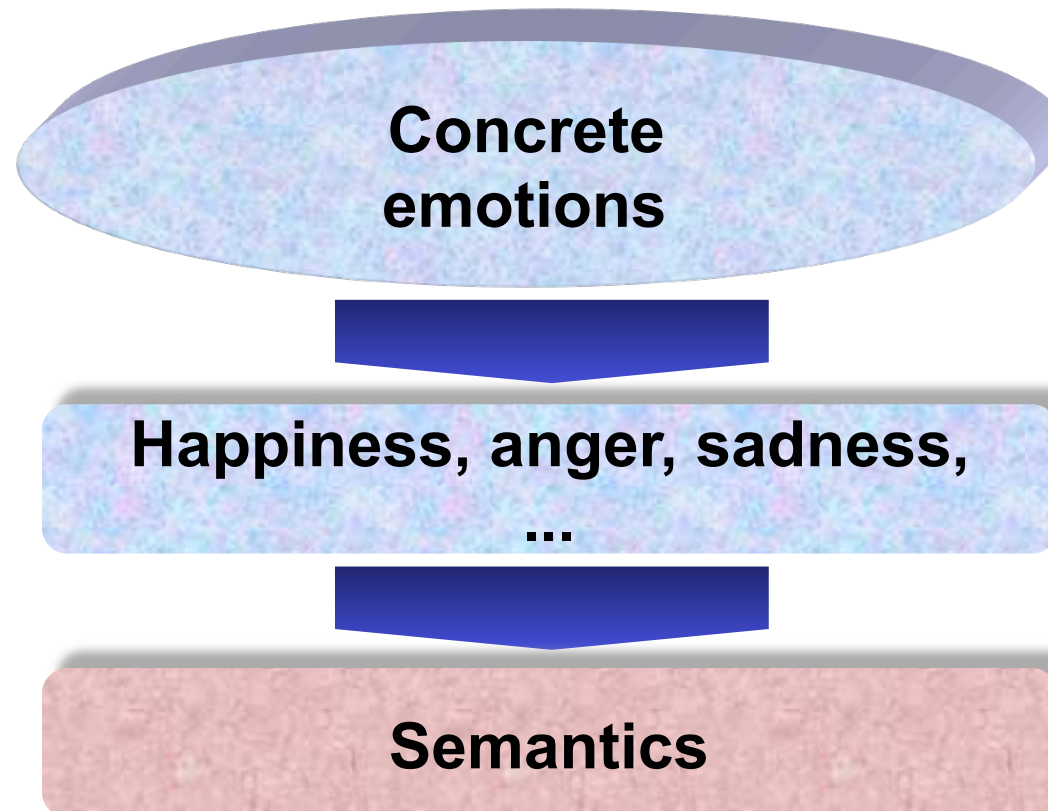
## Topics

- Characteristics of and emotional reactions to climate change
- People's evaluation of climate change and other environmental risks
  - Mental representation
  - Evaluative judgments
  - Emotional reactions
  - Behavior
- Summary and conclusions



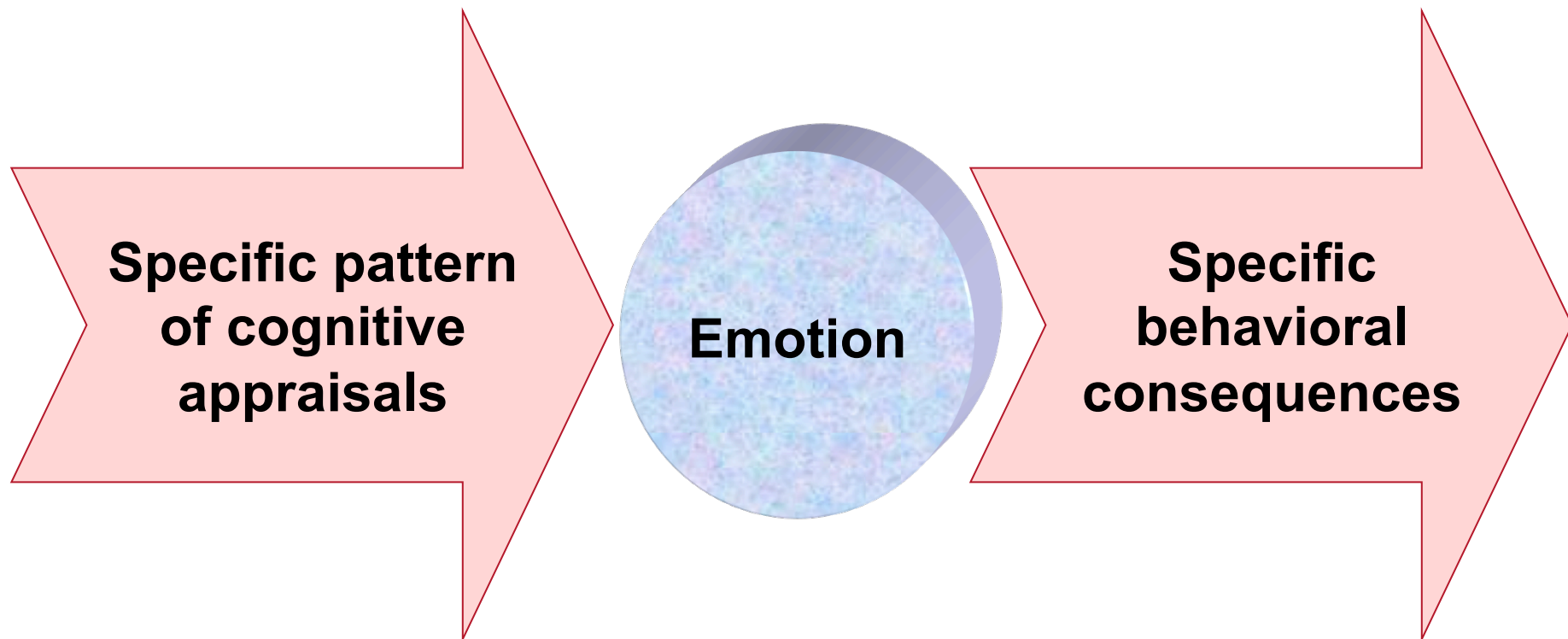
# Structure of Emotions

Concrete emotions imply specific semantics



# Structure of Emotions

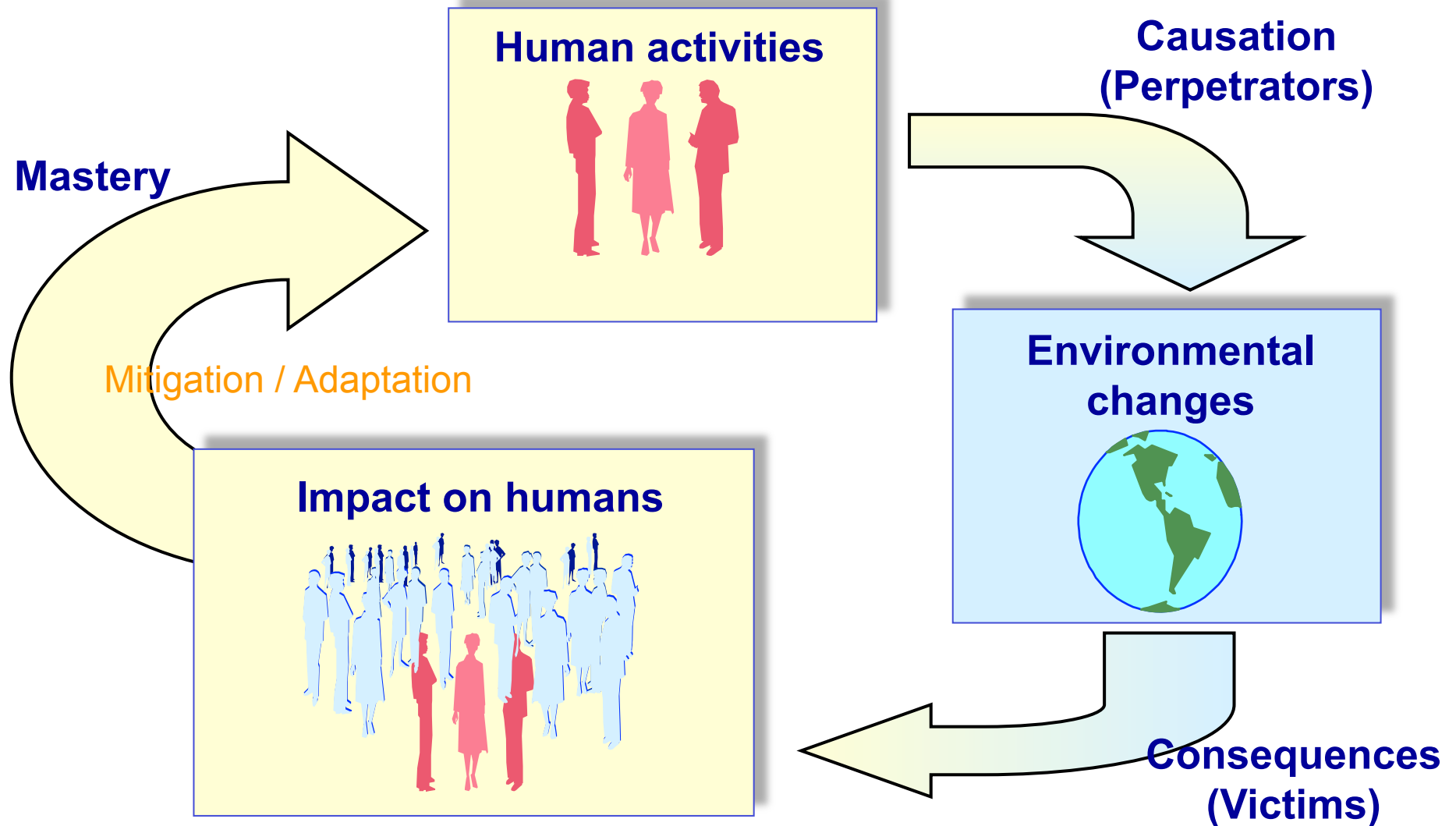
## Appraisal theories of emotion, basic model



z. B. Frijda (1993); Ortony, Clore & Collins (1988); Smith & Elsworth (1985),



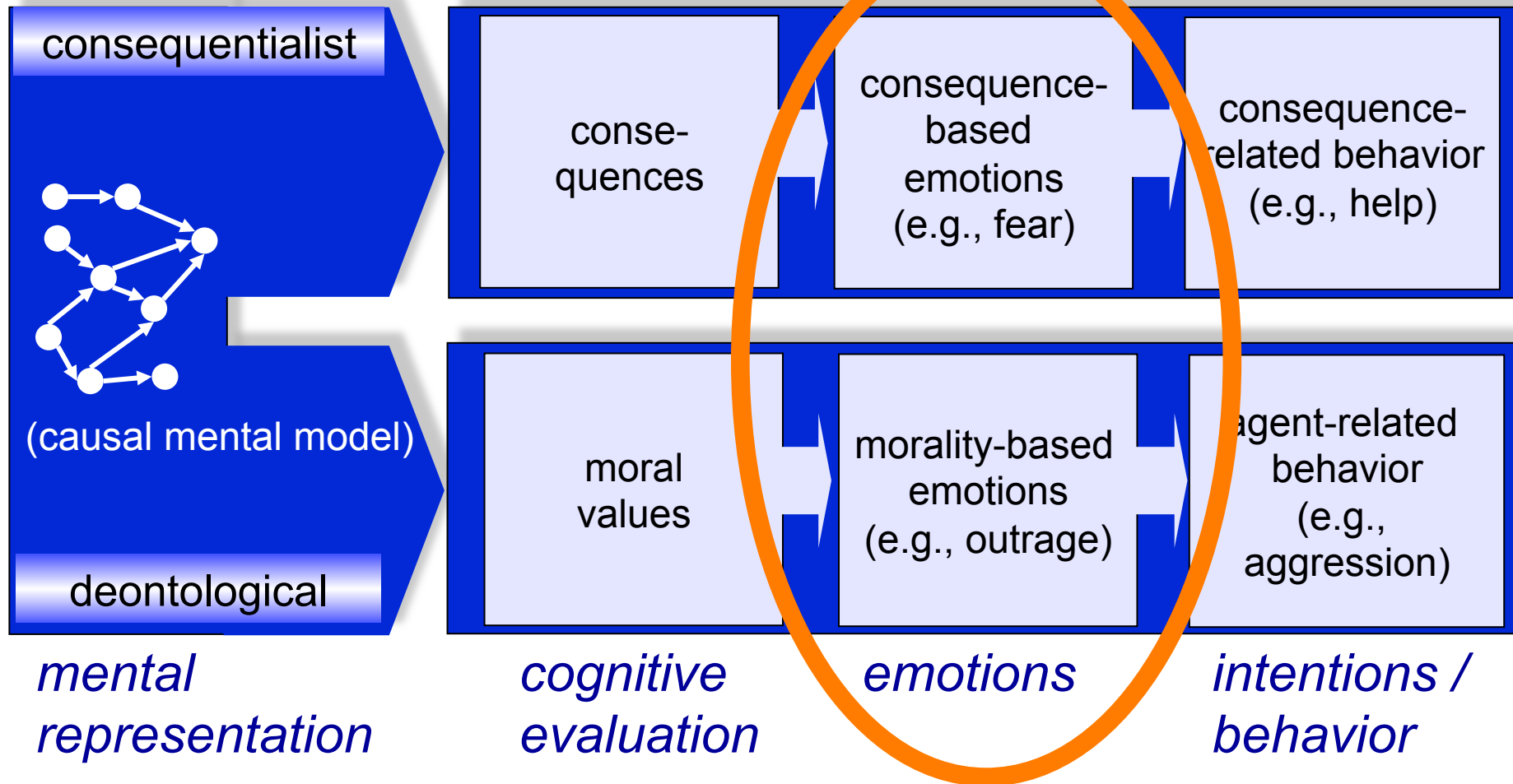
# Characteristics of Climate Change



# Appraisals - Emotions - Behavior

e.g., Böhm (2003); Böhm & Pfister (2000, 2005); Böhm & Tanner (2012); Pfister & Böhm (2001)

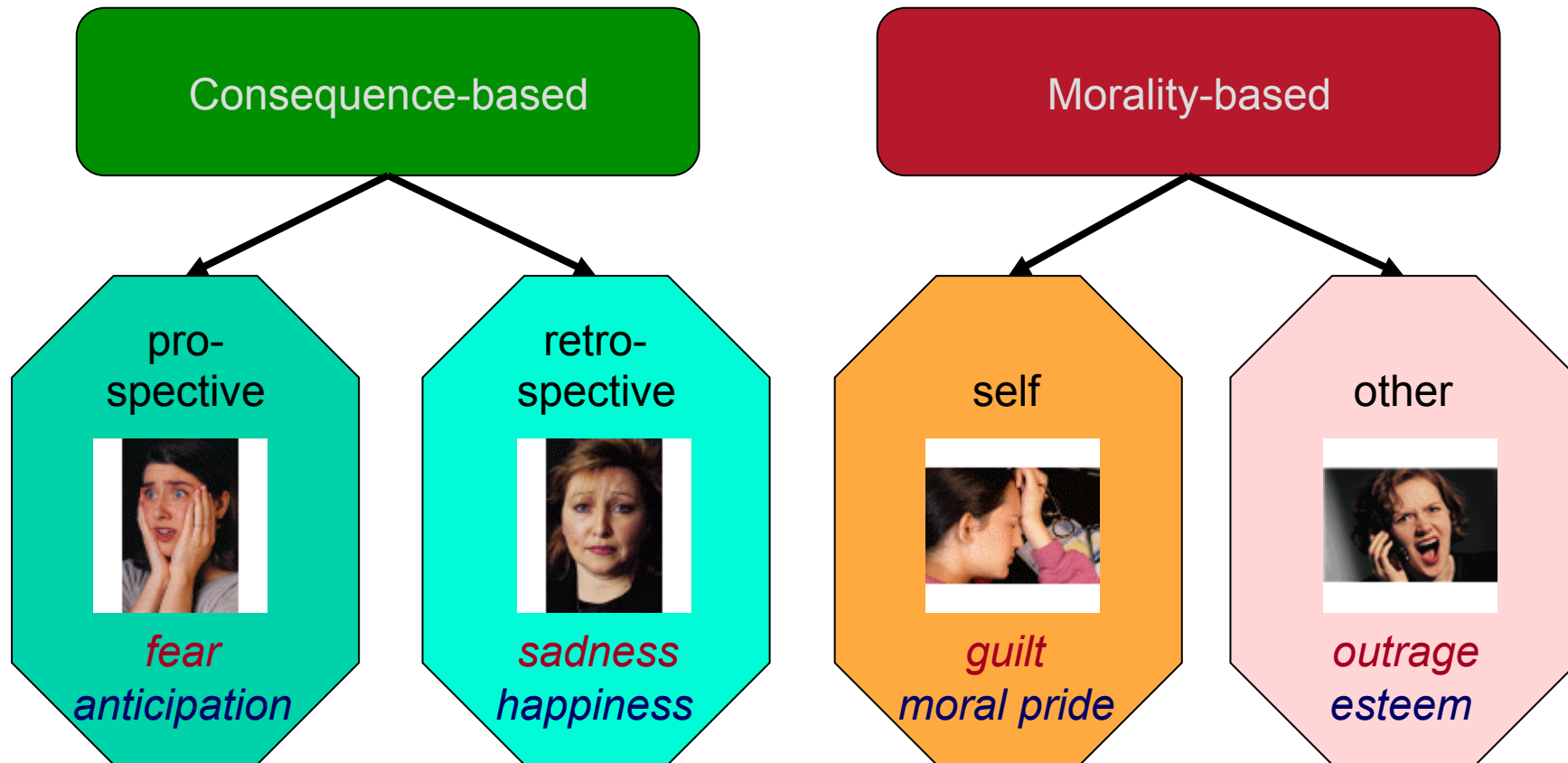
## Multi-Phase, Dual-Process Model



# Emotions in Risk Evaluations

## A classification

e.g., Böhm (2003); Böhm & Hanss (in press);  
Böhm & Tanner (in press)



# Environmental Emotions

## Evaluation of various environmental risks

- Presentation of various environmental risks
- Measures:
  - Cognitive evaluations
  - Emotional reactions

- sea level rise
- population density
- water shortage
- clear cutting of rain forest
- pesticides and herbicides
- waste dumps and incinerators
- storms and bad weather
- species extinction
- consumption of fossil energy
- earthquakes

- radioactive contamination
- air pollution from cars
- chemical dumps
- impure drinking water
- air pollution from industry
- acid rain
- hole in the ozone layer
- water pollution
- volcano eruptions
- forest fires

**Böhm (2003)**





# Environmental Emotions

## Emotion types: Factor analysis

	Factor			
	moral., other	cons., retro	moral., self	cons., prosp.
disgust	,963	,078	,099	,138
contempt	,936	,184	,237	,100
outrage	,891	,197	,341	,195
anger	,844	,177	,403	,241
disappointment	,807	,301	,436	,204
regret	,362	,861	,200	,266
sadness	,465	,791	,196	,300
sympathy	-,062	,778	-,532	,168
guilt	,344	-,062	,913	,077
shame	,617	,203	,744	,023
fear	,462	,091	,054	,802
hopelessness	,270	,542	,160	,702
hope	,331	-,410	,263	-,672
worry	,539	,277	,375	,635

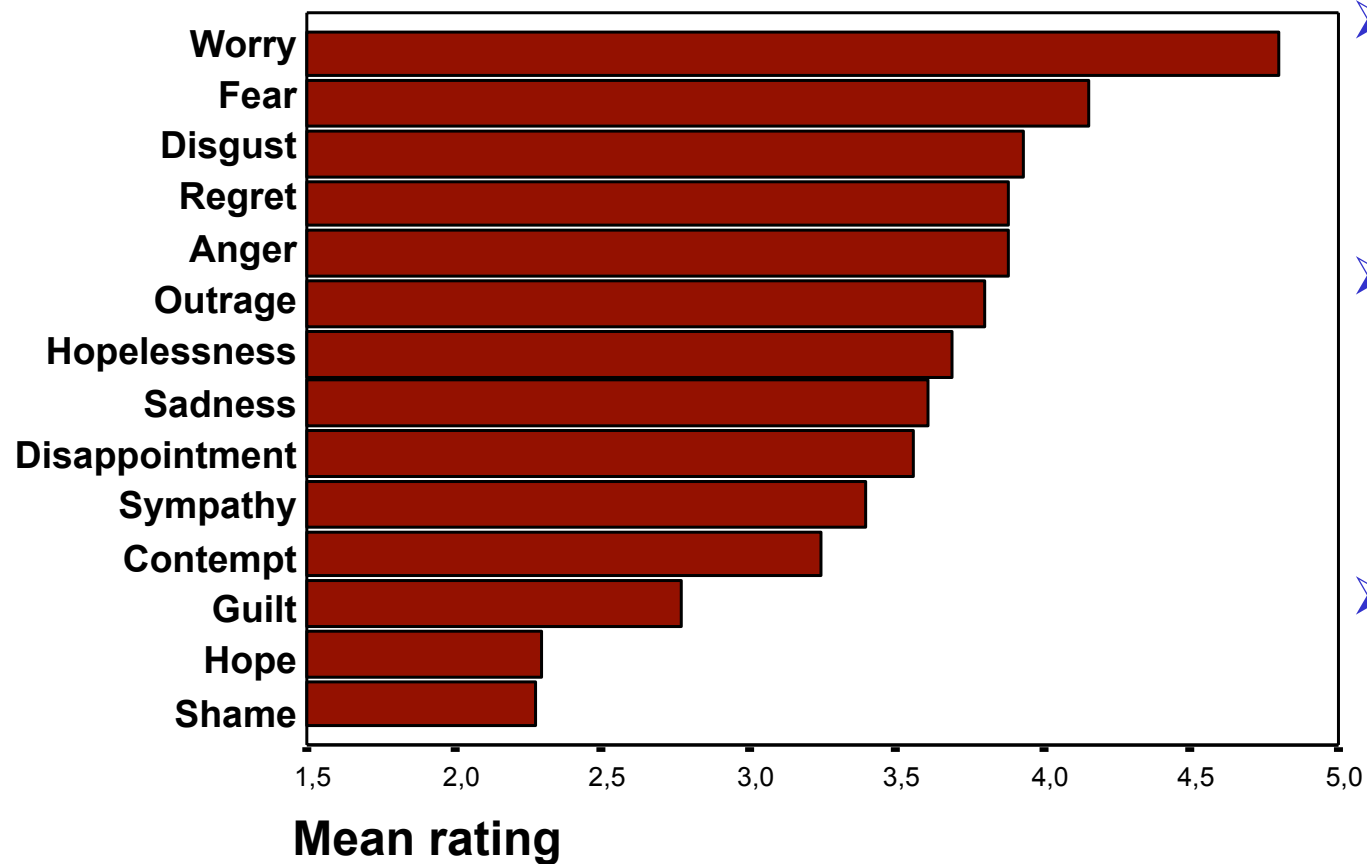
PCA, VARIMAX, 94% expl. Variance

**Böhm (2003)**



# Environmental Emotions

## Intensity of emotions elicited by various environmental risks



- Presentation of various environmental risks
- How intensely do you feel emotion X when thinking of risk Y?
- Rating 1 (not at all) ... 7 (very much)

**Böhm (2003)**



# Environmental Emotions

Intensity of emotions

Böhm (2003)

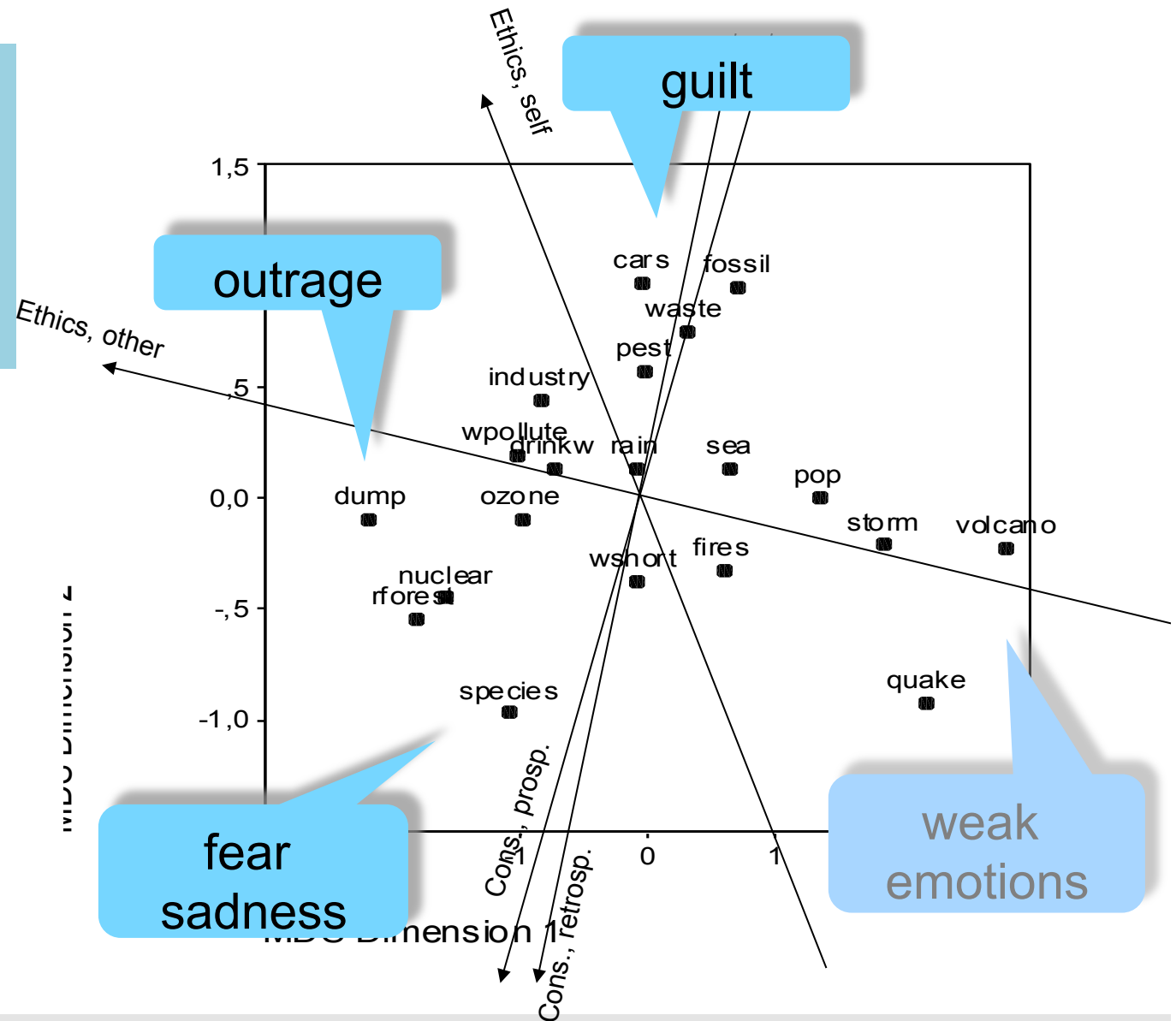


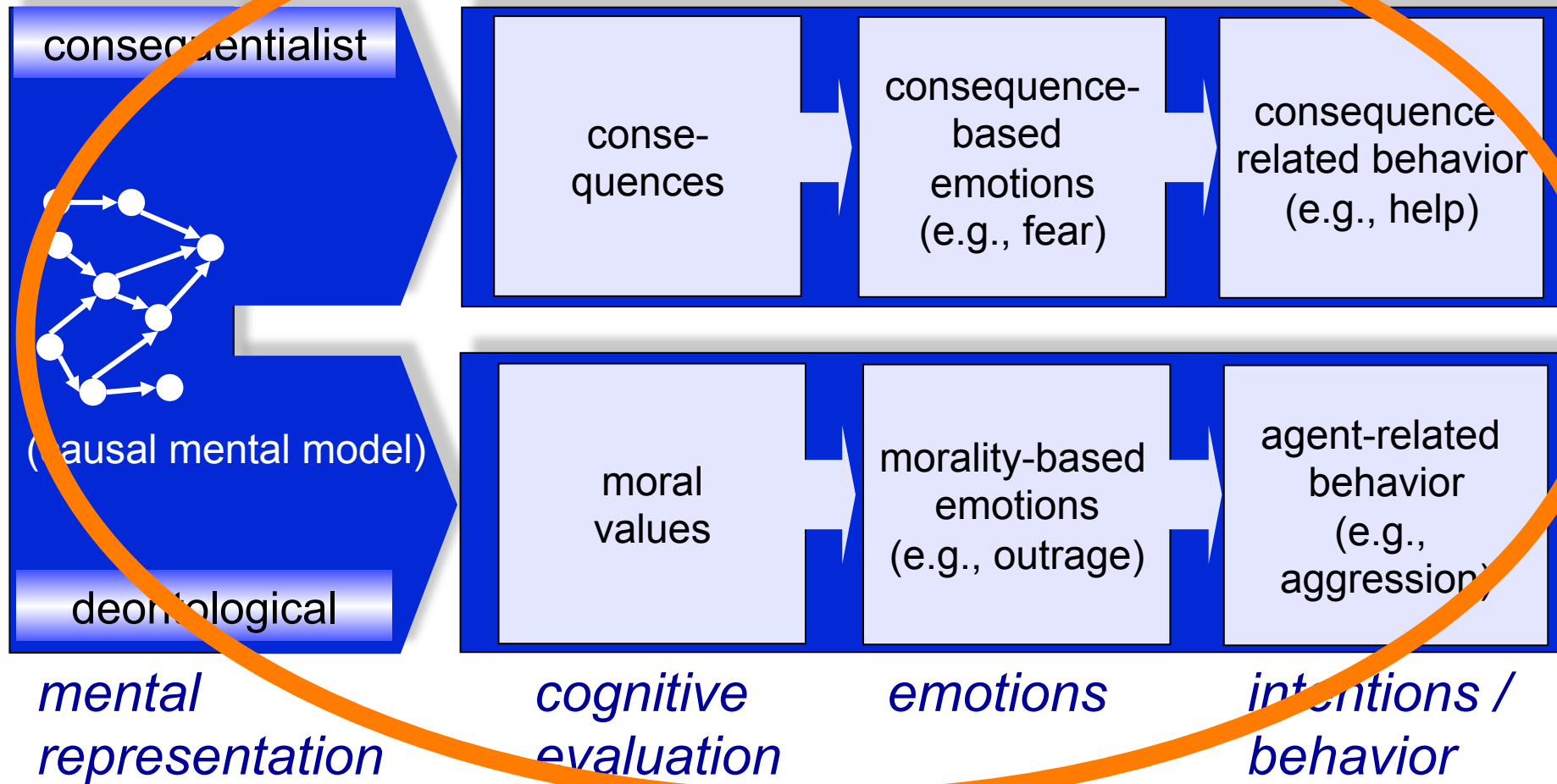
Figure 1. Multidimensional scaling solution of environmental risks based on emotion ratings. Vectors fitted into the configuration constitute emotion and judgmental indices.

cars: air pollution from cars, drinkw: impure drinking water, dump: chemical dumps, fires: forest fires, fossil: consumption of fossil energy, industry: air pollution from industry, nuclear: radioactive contamination, ozone: hole in the ozone layer, pest: pesticides and herbicides, pop: population density (e.g., crowding, population explosion), quake: earthquakes, rain: acid rain, rforest: clear cutting of rain forest, sea: sea level rise, species: species extinction, storm: storms and bad weather (e.g., thunder storms, hurricanes, storm tides, floods), volcano: volcano eruptions, waste: pollution from waste dumps and incinerators, wpollute: water pollution, wshort: water shortage (e.g., drought, water depletion).

# Appraisals - Emotions - Behavior

e.g., Böhm (2003); Böhm & Pfister (2000, 2005); Pfister & Böhm (2001)

## Multi-Phase, Dual-Process Model



# Appraisals - Emotions - Behavior

## Example for scenario

Spores from new water plants have been found in a river close to where you live. The new spores stem from the aquaria of a **fun park called "Oceanworld"**. Your community derives its drinking water from this river. Experts agree that the contamination of the drinking water may lead to serious **health effects** for humans. **You may personally** be affected.

*[Böhm & Pfister (2000): anthropogenic cause (single agent) / consequences for self]*



# Appraisals - Emotions - Behavior

## Evaluative focus: Consequentialist versus Deontological

Independent variables (information in scenario)

### *Causation*

- natural cause
- anthropogenic cause - cumulative causation
- anthropogenic - single, identifiable agent

Responsibility

### *Potential consequences*

- no neg. consequences
- neg. consequences for natural environment
- neg. consequences for other humans
- neg. consequences for self

Personal relevance

**Böhm & Pfister (2000)**



# Appraisals - Emotions - Behavior

**Evaluative focus: Consequentialist versus Deontological**

Dependent variables

*Cognitive appraisal*

- risk judgments
- moral blameworthiness

*Emotions*

- consequence-based
- morality-based

*Behavioral tendencies*

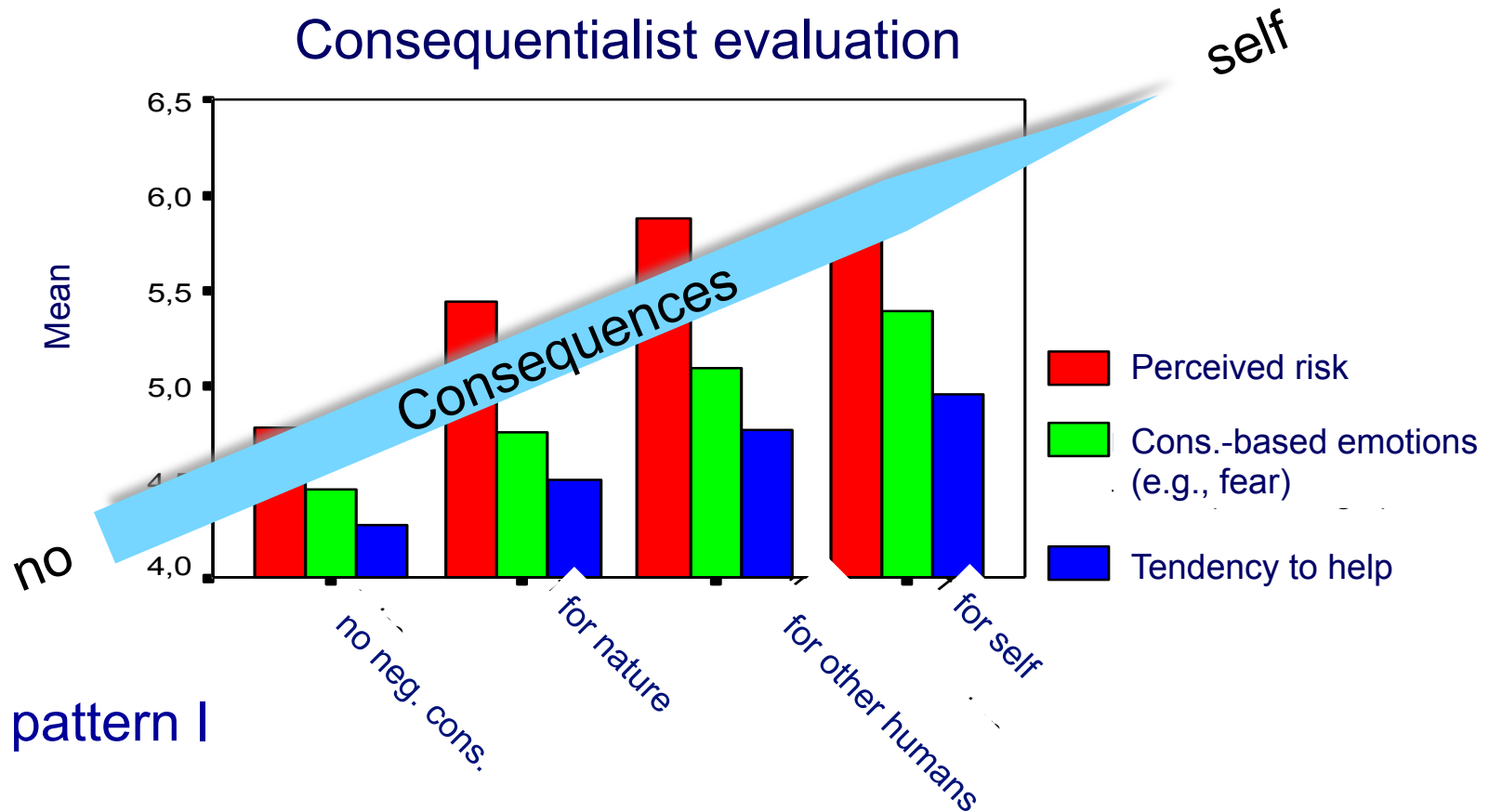
- Help
- Aggression

**Böhm & Pfister (2000)**



# Appraisals - Emotions - Behavior

## Evaluative focus: Consequentialist versus Deontological



Effect pattern I

**Böhm & Pfister (2000)**

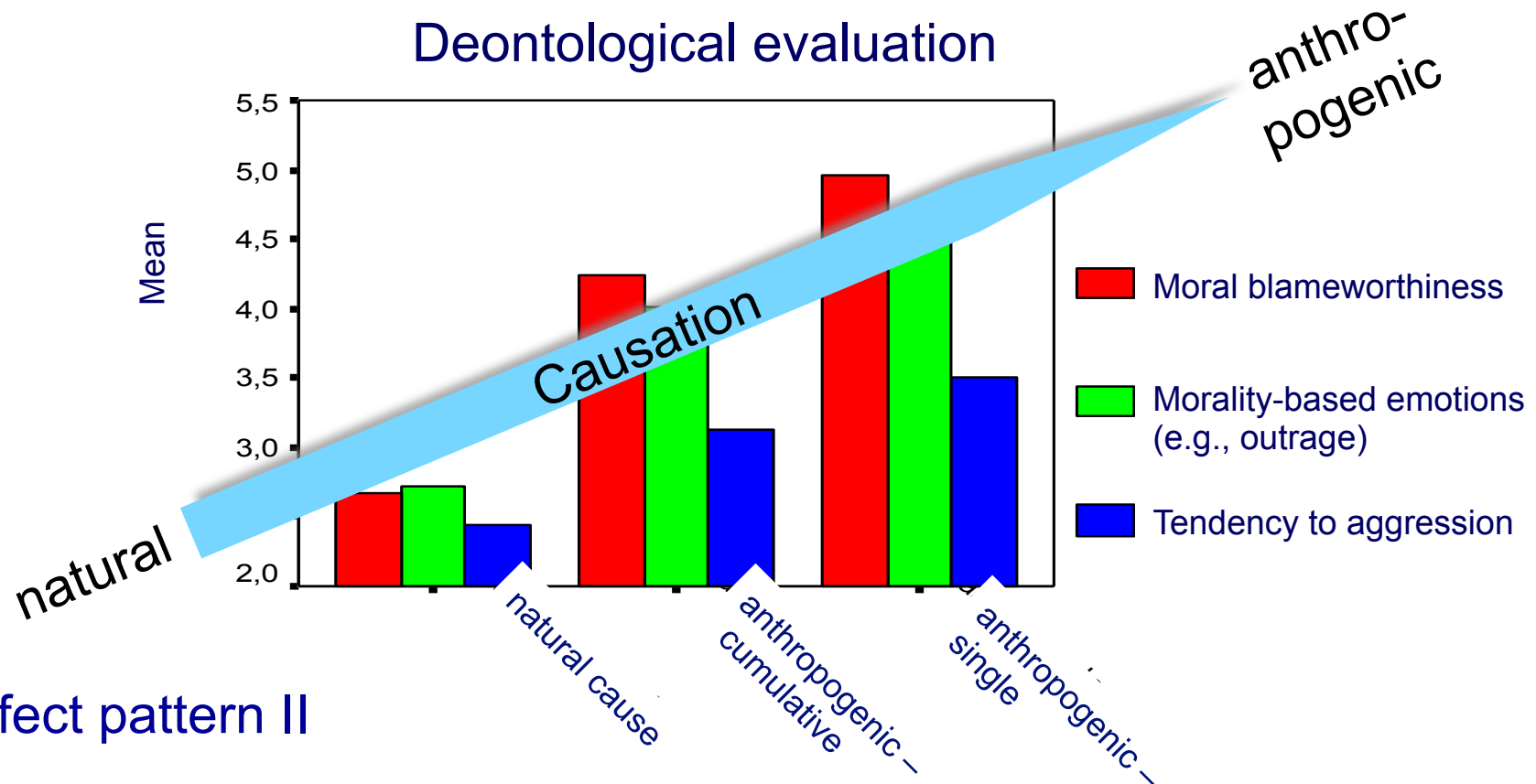
Consequences





# Appraisals - Emotions - Behavior

Evaluative focus: Consequentialist versus Deontological



Effect pattern II

Böhm & Pfister (2000)

Causation

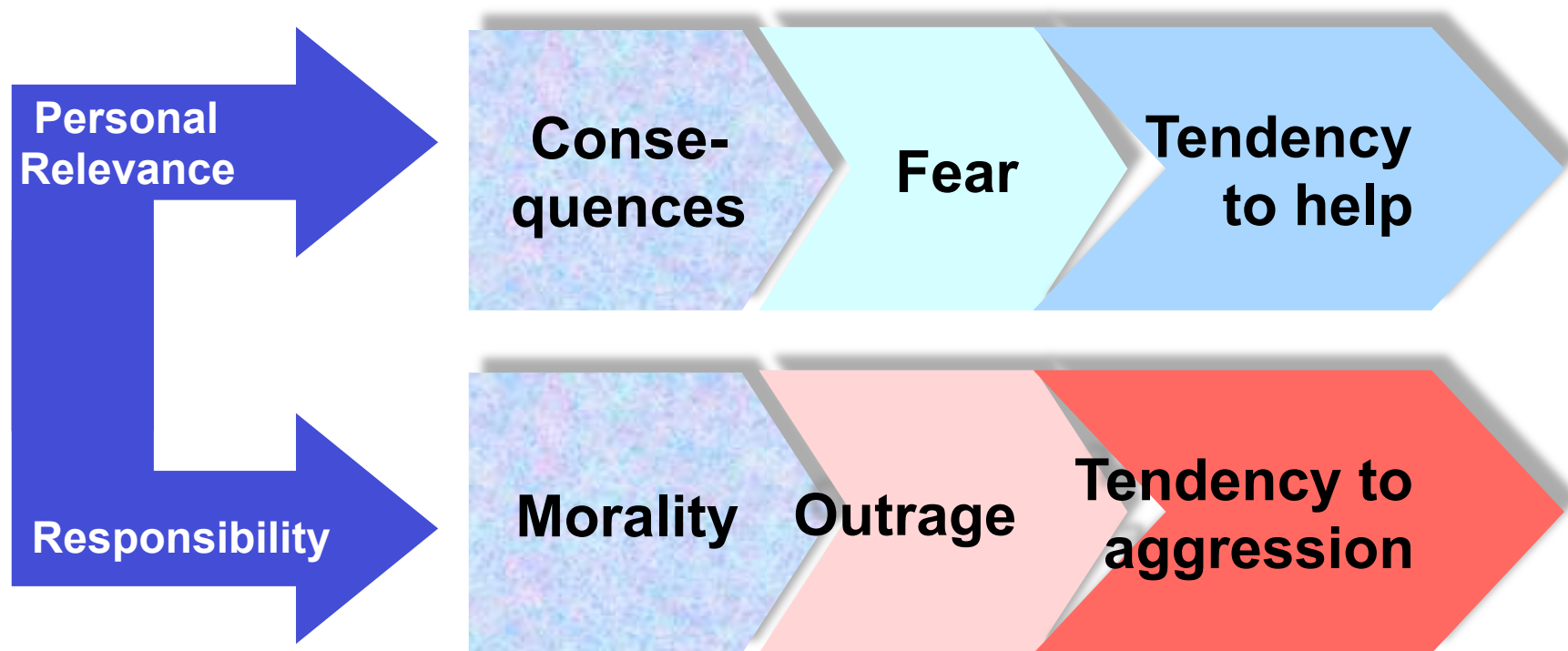


# Appraisals - Emotions - Behavior

Emotions guide environmental behavior

Böhm & Pfister (2000, 2005)

## Evaluative focus

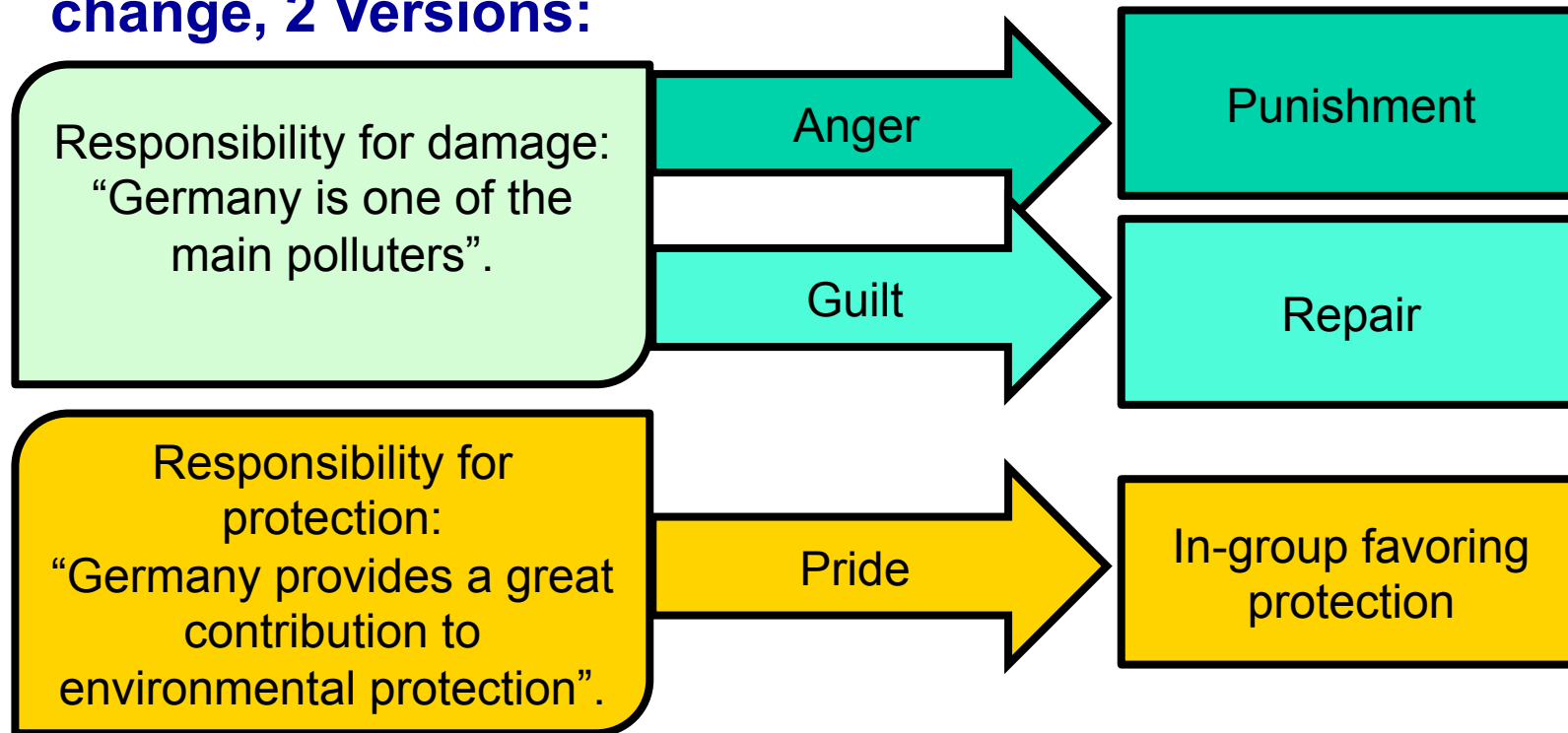


# Appraisals - Emotions - Behavior

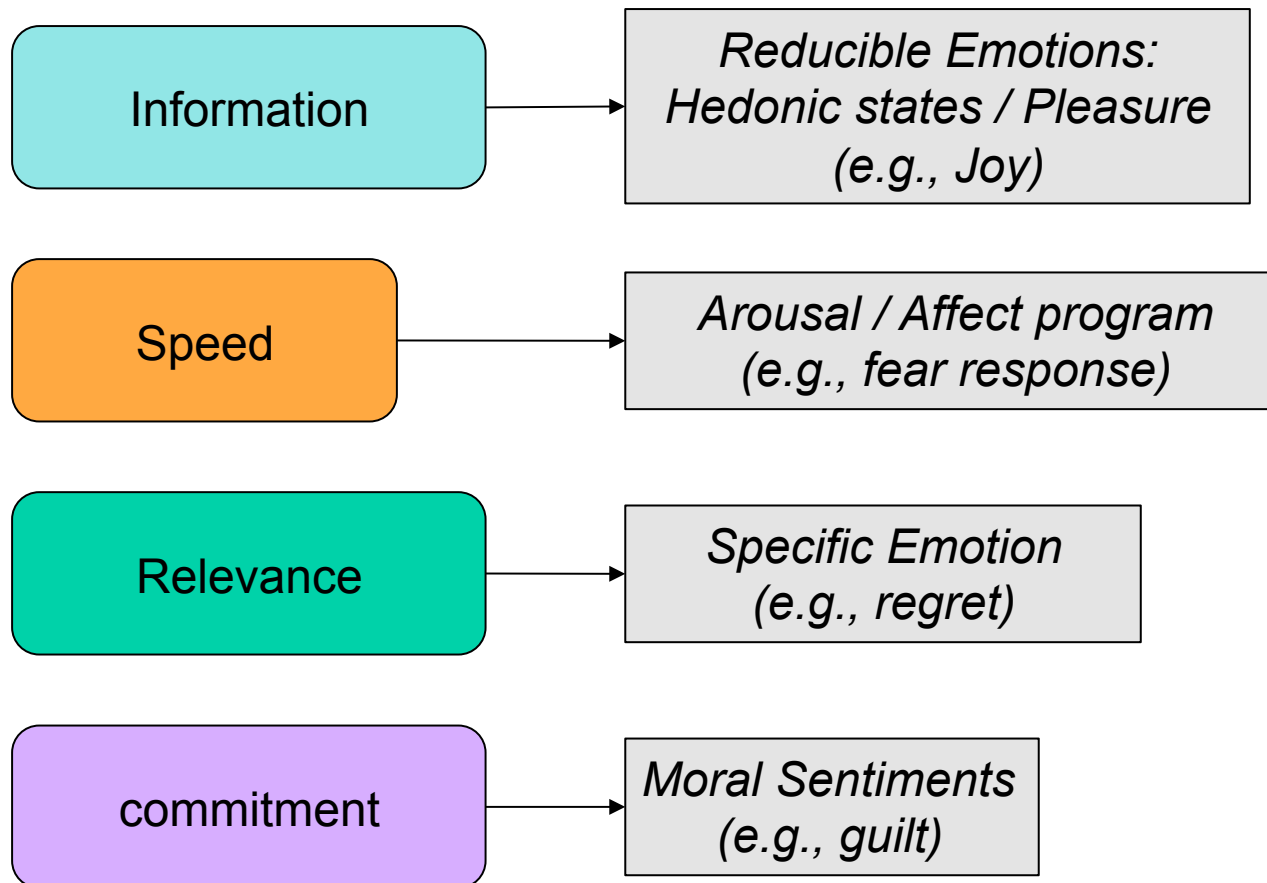
## Emotions guide environmental behavior

Harth, Leach & Kessler (2013, Study 1)

**Fictitious newspaper article on climate change, 2 Versions:**



# Multiple Functions of Emotions



Pfister & Böhm  
(2008)



# Summary and Conclusions

- ➡ Evaluation of climate change entails ethical considerations, apart from risk assessments.
- ➡ Specific appraisals elicit concrete emotions.
- ➡ Emotional reactions to climate change can be classified into consequence-based and morality-based emotions.
- ➡ Environmental behavior is guided by concrete emotions.
- ➡ Emotions serve multiple functions in guiding judgments and behavior.



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