Ethics and research

General Ethical Principles

A computing professional should...

Contribute to society and to human well-being, acknowledging that all people are stakeholders in computing

Avoid harm

Be honest and trustworthy

Be fair and take action not to discriminate

Respect the work required to produce new ideas, inventions, creative works, and computing artifacts

Respect privacy

Honor confidentiality

ACM Code of Ethics and Professional Conduct

PROFESSIONAL RESPONSIBILITIES

Strive to achieve high quality in both the processes and products of professional work

Maintain high standards of professional competence, conduct, and ethical practice

Know and respect existing rules pertaining to professional work

Accept and provide appropriate professional review

Give comprehensive and thorough evaluations of computer systems and their impacts, including analysis of possible risks

Perform work only in areas of competence

Foster public awareness and understanding of computing, related technologies, and their consequences

Access computing and communication resources only when authorized or when compelled by the public good

Design and implement systems that are robustly and usably secure

ACM Code of Ethics and Professional Conduct

Example: Axiology and Artificial Intelligence

Two different opinions:
Science and research in AI should be seen as neutral and value-free; the value of science is given by its users.

Science and research in AI Research is not neutral, is always rooted in certain values and beliefs – its axiology – which serve certain purposes.

Sustainability Concepts

Weak Sustainability	Strong Sustainability
• Natural, human and reproducible capital can be substituted for each other. • Natural, human and reproducible capital are an aggregate, homogeneous stock.	• Cannot always substitute for natural capital with reproducible or human capital. • Cannot view natural, reproducible and human capital as a homogeneous stock.
• Natural capital should be used efficiently over time. • As long as depleted natural capital is replaced with even more valuable reproducible and human capital, then the value of the aggregate stock will increase.	• Certain environmental sinks, processes and services are unique and essential, subject to irreversible loss, and there is uncertainty over their future value and importance.
• Maintaining and enhancing the value of this aggregate capital stock is sufficient for sustainability.	• Maintaining and enhancing the value of the value of the aggregate capital stock is necessary but not sufficient. • Sustainability also requires preserving unique and essential natural capital.

Big Data and Research

Recent reports of malpractices by major Big Data-enabled enterprises such as Facebook and Google compromise user privacy.

Are there other examples of unethical Research? First we need to ask ourselves, what is the relationship between Bigdata and Reerach?

<u>General definitions of Big Data:</u>

“the current techniques and technologies may not be able to handle [its] storage and processing” (Suthaharan, 2014, p. 70).

“a capacity to search, aggregate, and cross-reference large data sets” (Boyd & Crawford, 2012, p. 663)

Authors differentiate between:

- Research with Big data
- Research on Big Data

Axiology and Data use

Both fields are similar but different:

- Research with Big Data need not always be research on Big Data issues
- Research on Big Data may involve other methods

What defines topics on both fields?

Axiology

Research is always rooted in certain values and beliefs – its axiology – which serve certain purposes.

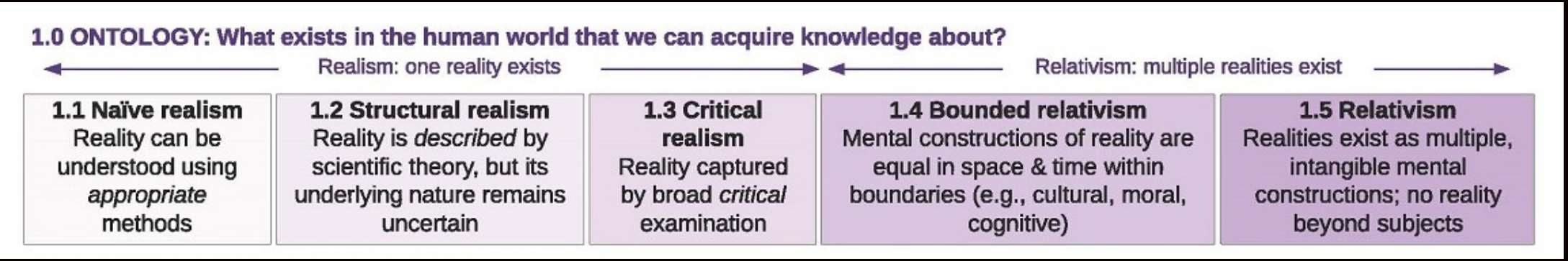
In the view of axiology, science is seen as neutral and value-free; the value of science is given by its users. Authors differentiate between two Axiologies:

Administrative Axiology
Critical Axiology

Axiology, Ontology and Epistemology

Heuristics are mental shortcuts that can facilitate problem-solving and probability judgments. These strategies are generalizations, or rules-of-thumb. We use heuristics to make decisions fast, based on general rules, or logics that may be or not optimal. Thea are related to cognitive biases. Biases and heuristics are part of our automatic or intuitive system of thinking, and they occur without our awareness.

Axiology is related to Ontology and Epistemology.



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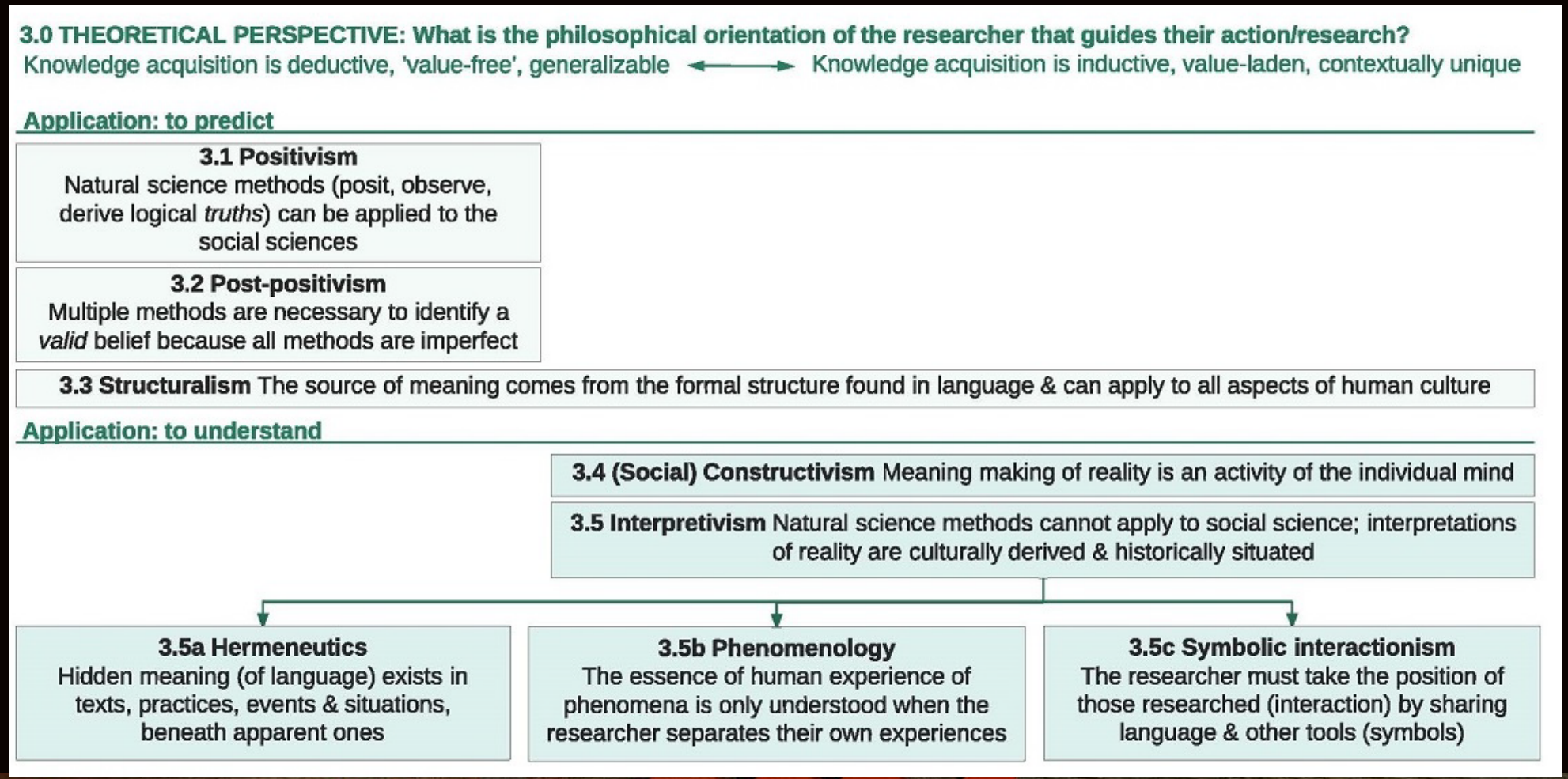
Axiology is related to Ontology and Epistemology.

2.0 EPISTEMOLOGY: How do we create knowledge?		
2.1 Objectivism Meaning exists within an object: an objective reality exists in an object independent of the subject	**2.2 Constructionism*** Meaning created from interplay between the subject & object: subject *constructs* reality of object	**2.3 Subjectivism** Meaning exists within the subject: subject imposes meaning on an object

Axiology, Ontology and Epistemology

Our Ontology and Epistemological position impacts/determines our theoretical perspective



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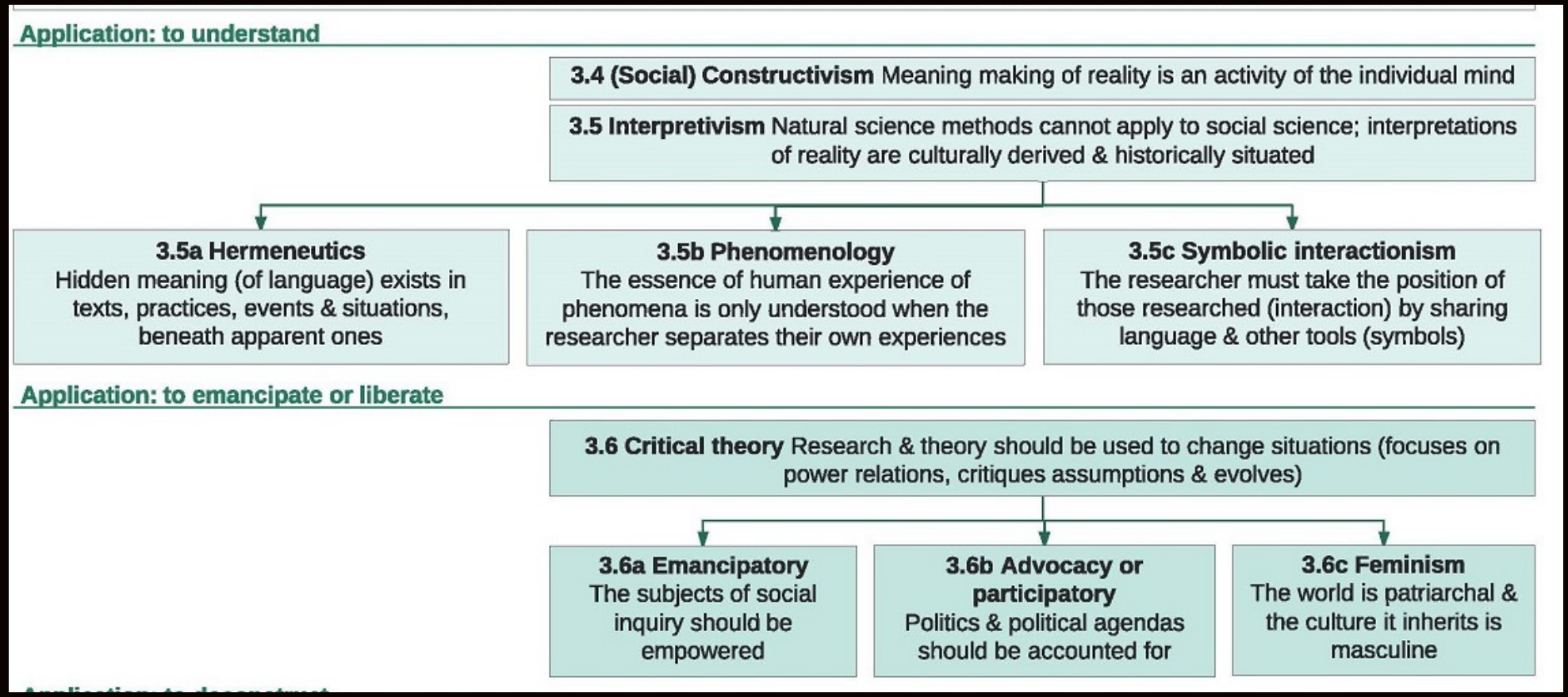

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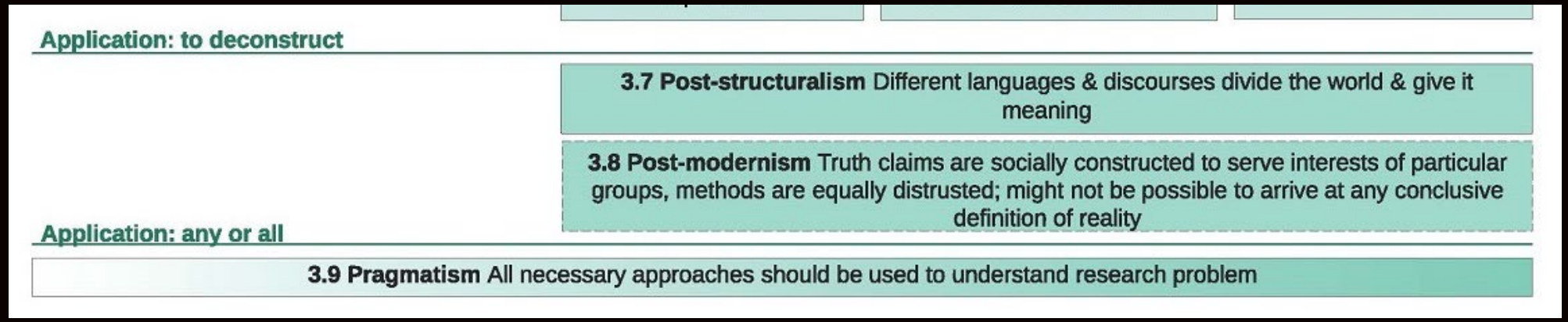

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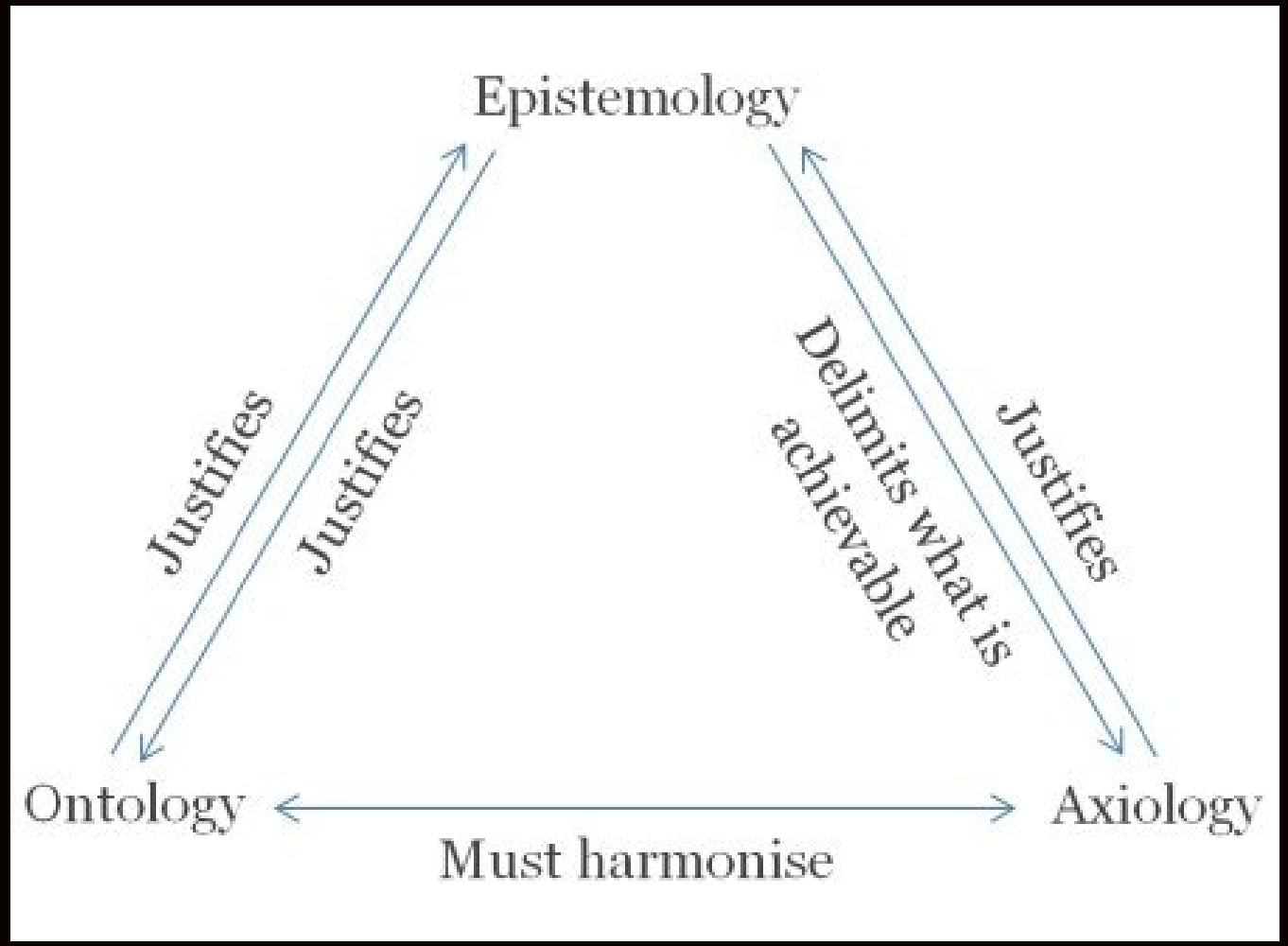
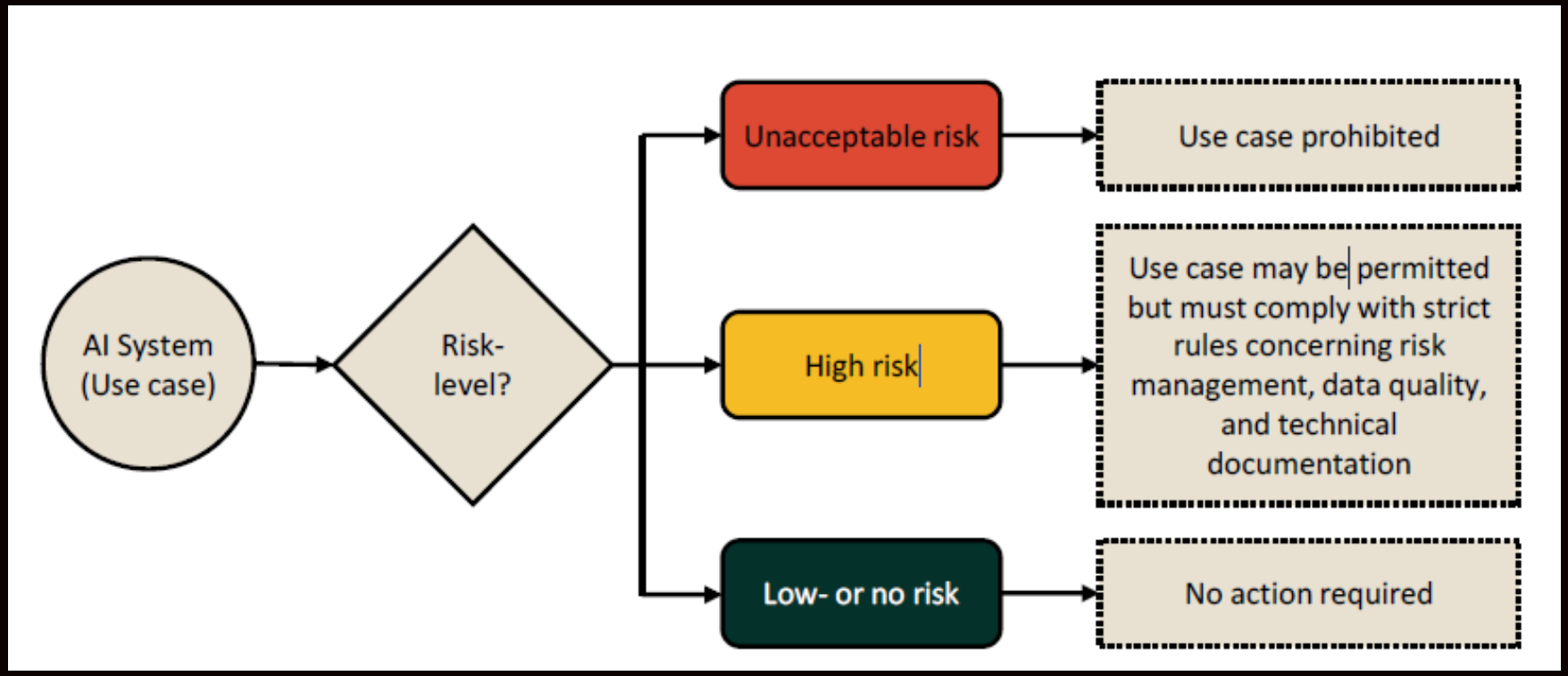


Delimiting and justifying what we do as researchers generates limits to Science.

Limits to Research: Axiology in AI & Biomedical science

Risk categories for AI use cases under the AIA



Principles for trustworthy AI and BS

- 1. Lawful:
- 2. Technically robust
- 3. Ethical

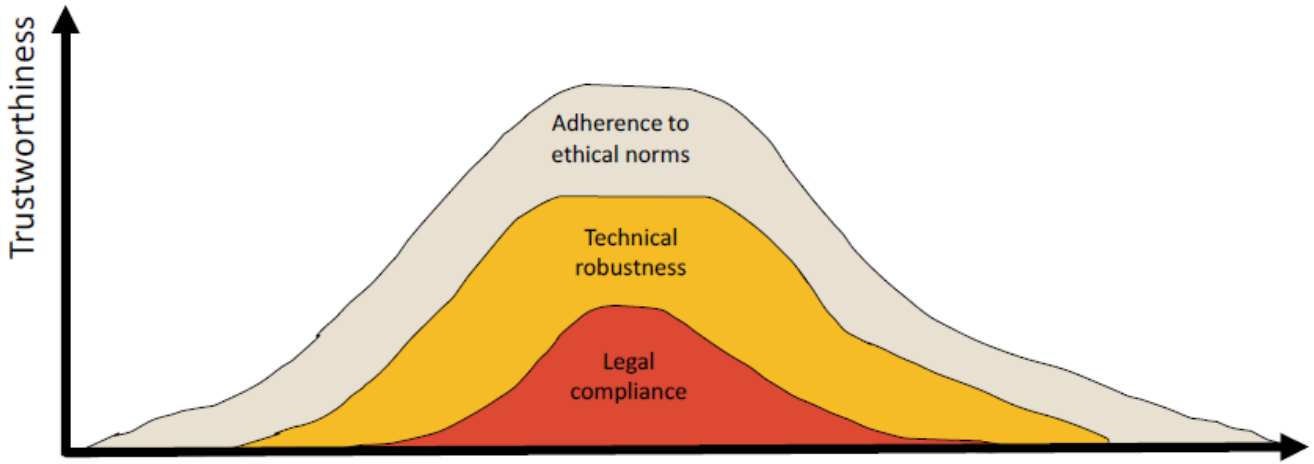


Figure 2: *The sand cone model of cumulative capabilities, applied to AI trustworthiness*

Source: adapted from [19].

Example of AI Failure

1. Privacy intrusion (Lawful)

- consent to use the data
- consent to use the data for the intended purpose

2. Algorithmic bias (technical)

- Systematically disadvantages (or even exclusion) one group based on personal identifiers such as race, gender, sexual orientation, age or socio-economic background

3. Explicability (Ethical)

algorithms may reinforce (i) epistemic and (ii) normative concerns that can lead to unfair outcomes

AI and industry

Why is this relevant not only for academic research?

Identifying bias in technology lifecycle

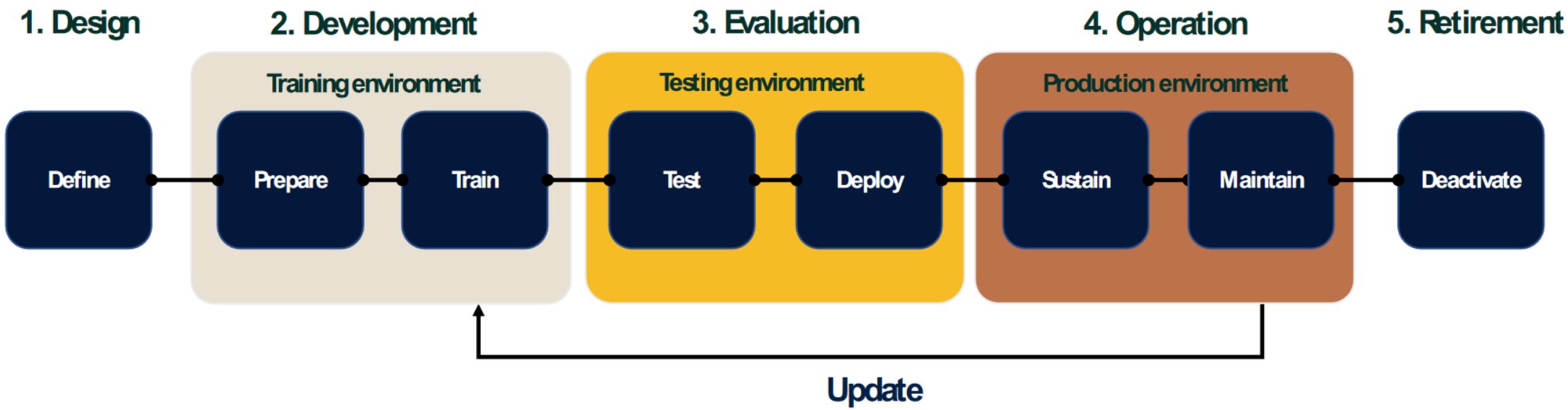
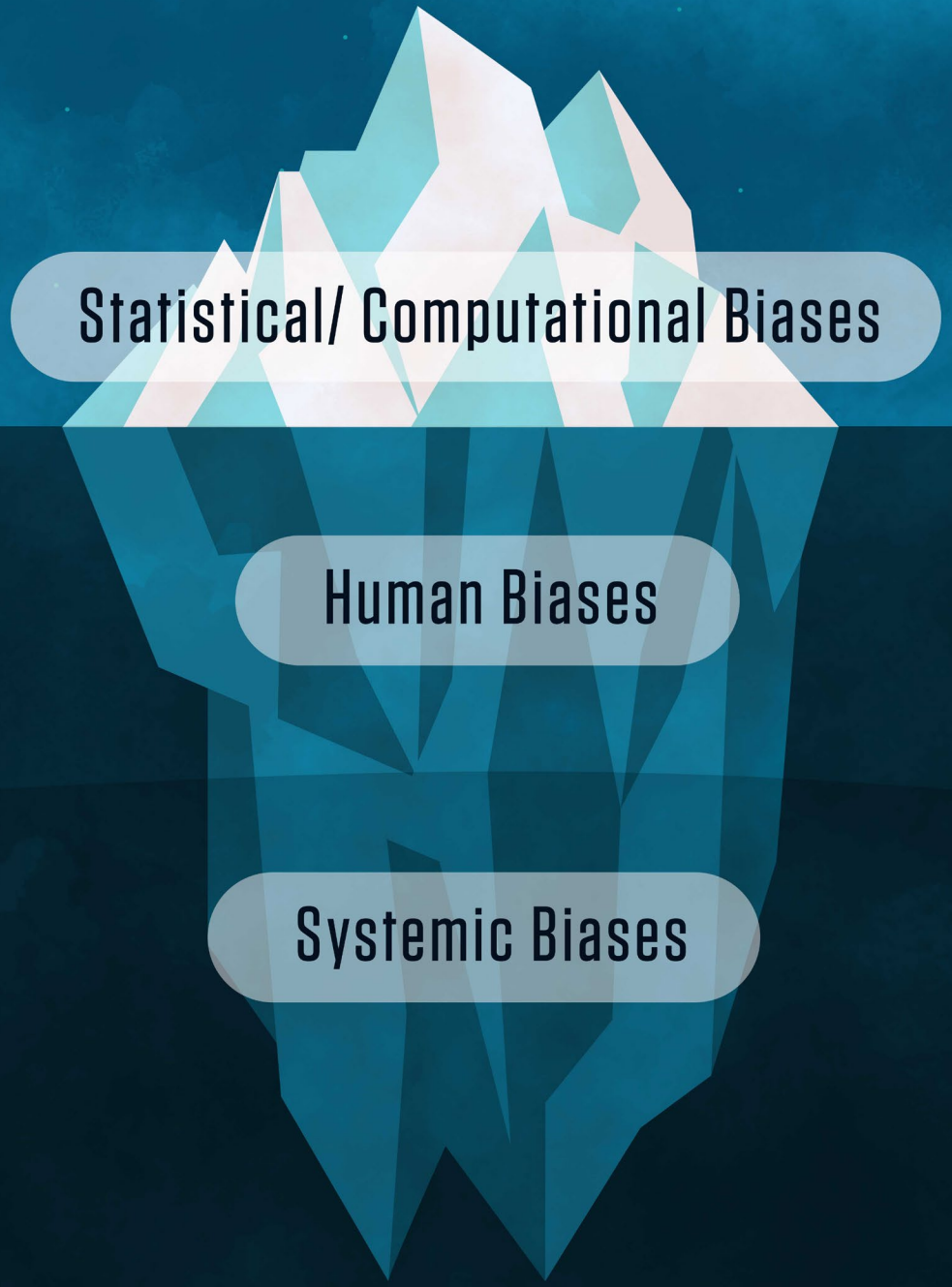


Figure 8: *The five stages of the AI life cycle*

THE PROBLEM


Statistical/ Computational Biases
Human Biases
Systemic Biases