ARTS-L0112

Philosophy of Science

1. Introduction

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Practicalities

- Course page: MyCourses → ARTS-L0112
- Lectures: 31.1.–2.5. (no lectures on 21.2. or 11.4.)
  - 17:00–19:00 (includes a discussion and/or a break)
- Required readings + recommendations
  - Required readings will be made available on the course page
- Essays: 5 short essays during
  - 1–2 pages

The Aims of the Course

- To understand:
  - how science works
  - why scientific knowledge is both reliable and fallible
  - the differences between different kinds of research
  - how art-based research is related to humanities and sciences

What Is Science?

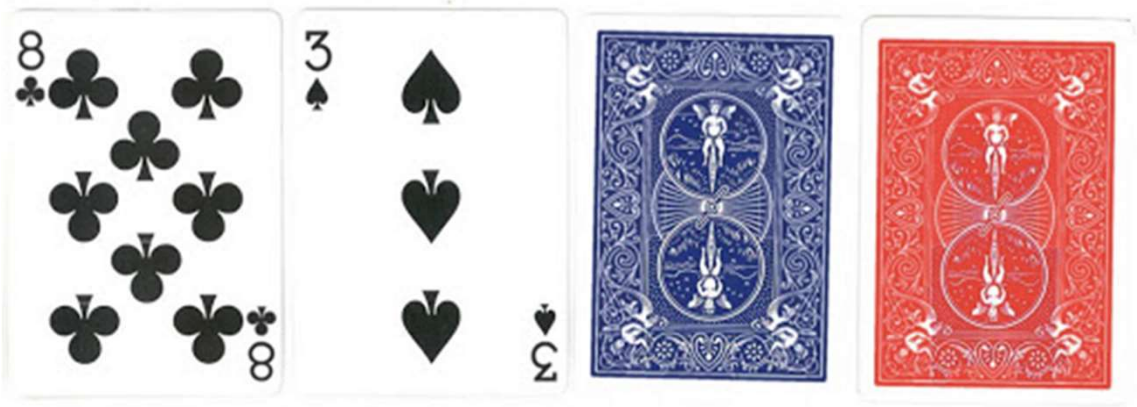
1) **Scientific knowledge** = the results of scientific research
   - the most tested set of believes we have = most reliable
   - **fallible**: may turn out to be wrong – if the evidence shows this
2) **Science as a process**
   - the nature of this process makes it reliable
3) **Scientific method**
   - the collection of methods, principles and practices that make the process reliable
4) **The scientific community**
   - the researchers and the research institutes
   - the authority depends on the validity of the method

The Scientific Method

- Corrects false beliefs
- Corrects the bad habits of everyday thinking
- The key features:
  - interaction with the object of study: experiments, systematic observations
  - systematic testing: search for both confirmatory and falsificatory evidence
  - continuous development of the methods
  - the significance of the community: correcting each others mistakes and biases
- The methods depend on the nature of the object of the research
- Philosophy of science: description and constructive criticism of how science works

Problems of everyday thinking 1: Logical thinking vs. heuristics

- Rule: if the number on the card is even, the back-side is red
- Which card do you have to turn to test whether this rule applies?

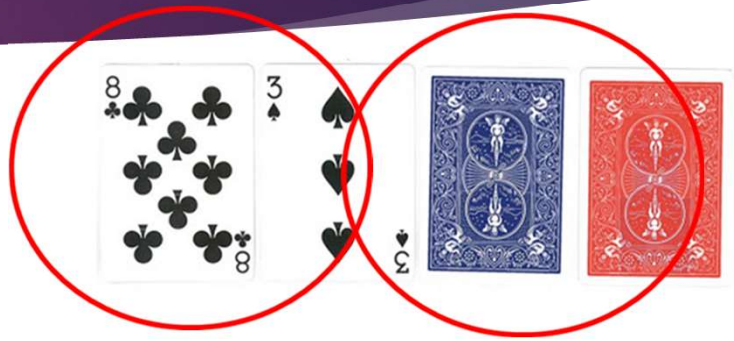


Problems of everyday thinking 1: Logical thinking vs. heuristics

- Rule: if you drink alcohol, you must be 18 or older
- Which ages or drinks you have to check?

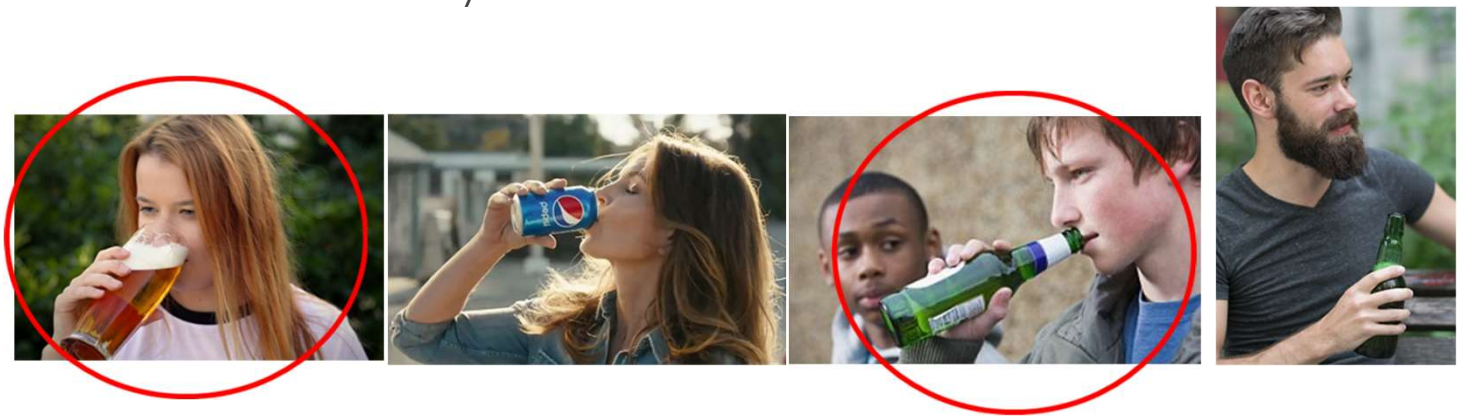



Problems of everyday thinking 1: Logical thinking vs. heuristics



- The tasks are logically identical: "if P, then Q"
  - the rules is broken if and only if P and not-Q

- Most people get the *normative* task right but not the descriptive
- Intuitions are reliable based on familiarity of the task



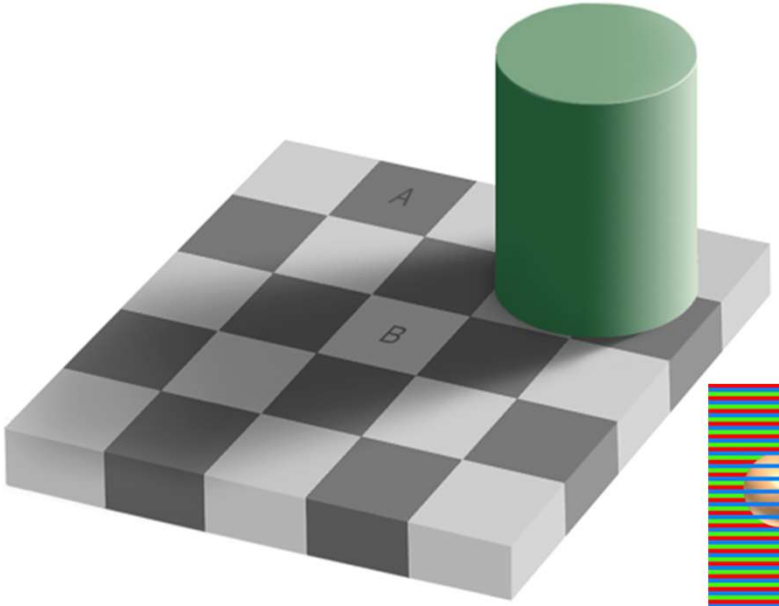
Problems of everyday thinking 2: Statistical thinking

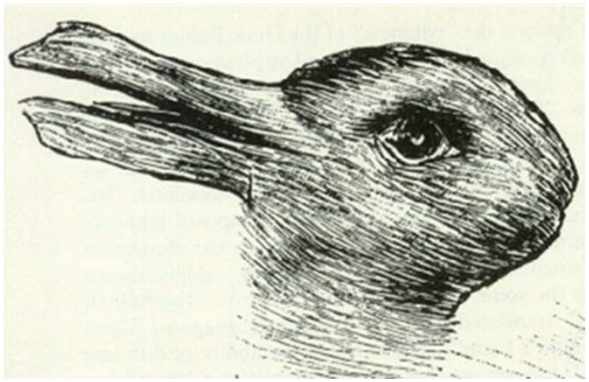
- "Men always X" – because often men X
  - The correct formulation: usually men X (while women usually don't)
  - That is: a man is more likely to X than a woman
- To confirm this, we need to know:
  1) How often men X
  2) How often men don't X
  3) How often women X
  4) How often women don't X
- We need systematic observations instead of anecdotes

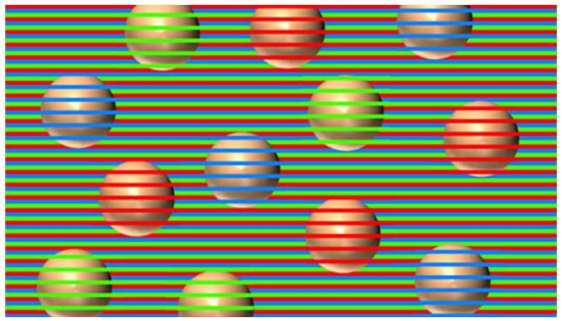
Problems of everyday thinking 3: Essentialistic thinking

- We assume that groups share essential properties
  - gender, ethnicity, education etc.
  - we make generalizations based on this assumption
- Problems:
  - this is not observed but presupposed
  - statistical generalizations do not entail essences
  - e.g. men are taller than women on the population level but this does not hold true for everyone

Problems of everyday thinking 4: Limitations in observation







Problems of everyday thinking 4: Limitations in observation

- Observations require a context (e.g. a story)
  - e.g. listening to others always involves interpretation
  - eye-witness testimony is always unreliable
  - recollection is always re-arrangement of fragments
- The influence of prior assumptions
  - is the Sun or Earth moving?
  - Addiction:
    1) Bad choices
    2) Life history and chemical processes

How Science Corrects the Problems?

- Systematic observations (measurements when possible), precise descriptions (with specialized language)
- Replicability
- Open and critical discussion on results, methods and background assumptions
- Awarness of biases in thinking and observation
- But: all these problems remain in science in smaller doses

The Objects of Research

The complexity of and diversity in the objects of research grows

Humanities	the logic of the systems of meaning
Social Sciences	the interaction of humans and social institutions
Psychology	the structure and processes of mind
Biology	the functional structure of living systems
Physical Sciences	the fundamental structure of reality

The exactness of methods and reliability of results grows

Art-based Research?

- Studying reality through art?
  - Is there something that science cannot reach but art can?
  - The subjective experience of the world?
  - Opposite to science?
    - objectivity and repeatability vs. subjectivity and particularity
  - Or similar to it?
    - providing a way to make observations
    - sharing experiences (not entirely subjective)
    - challenging conventional thinking and everyday observations
- Studying art through practice?
  - experimental methods to gain knowledge (vs. external observation in traditional art studies)

The Course Plan

7.2.	Theories and observations	Sofia Blanco Sequeiros
14.2.	Data, theories and phenomena	Sofia Blanco Sequeiros
28.2.	Paradigms and the progress of science	Tuomas Vesterinen
7.3.	Natural and human kinds	Tuomas Vesterinen
14.3.	Science and values	Teemu Lari
21.3.	Objectivity	Teemu Lari

The Course Plan

28.3.	Art as an object of study	Edna Huotari
4.4.	Art and science I	Edna Huotari
18.4.	Explanation and understanding	Tuomas Vesterinen
25.4.	Art and science II	Tomi Kokkonen
2.5.	Interdisciplinarity and transdisciplinarity	Tomi Kokkonen

The Readings for the Next Lecture

- Peter Godfrey-Smith (2003): Theory and Reality
  - Required: Chapters 1 and 3.1 & 3.2
  - Optional: Chapter 2, the rest of the Chapter 3, Chapter 4
- For both lectures 2 and 3