PH458

Evidence and Values

Dr. Ioannis Votsis
LAK3.01 (Lakatos Building)
Office hours: Tuesdays 15:00-16:00
i.votsis@lse.ac.uk
www.votsis.org

Introduction

Aims: A hierarchical view

- Human beings have aims and means through which to bring them about.

  NB: No assumption that these aims are universal.

- Some aims may be ultimate (or at least highly sought-after)

  * to survive
  * to reproduce
  * to gain social status

- Others may be subservient, i.e. also means to other aims:

  * hunting
  * finding a mate
  * making a fortune

Aims and values

- Human beings also have values. Are aims and values just different ways of expressing the same things?

- After all, we do also seem to value:

  * survival
  * having children
  * a higher social status

- However, the two sometimes come apart.

  * aiming to kill (e.g. for gain) without valuing killing.

- Still the two categories seem correlated. Do aims reflect values or vice-versa?

4

Values: A hierarchical view

- Our attitude to values seems to be similarly hierarchical.

  For example, it may be argued that **we value**:
  * our life
  * truths
  * overall happiness

  more than:
  * the loss of a finger
  * lies
  * momentary gratification

- Indeed, some values help realise other aims and values, e.g. we value customer satisfaction because we value profit.

5

Aims and Values in Science

From scientists to science

- As human beings, scientists also have aims and values.

- What are those aims and values that pertain to the *scientific part* of their lives?

- Are they shared across

  * a given subfield?
  * a whole field or science?
  * the natural sciences?
  * all the sciences?

- If so, can we speak of *science* (or a part thereof) as having associated aims and values?

The ultimate aim of science?

- Several proposals put forth about the ultimate aim(s) of science. For example, constructive empiricists assert:

  "Science aims to give us theories which are empirically adequate; and acceptance of a theory involves as belief only that it is empirically adequate" (van Fraassen 1980: 12).

- Other proposals of ultimate aims include:

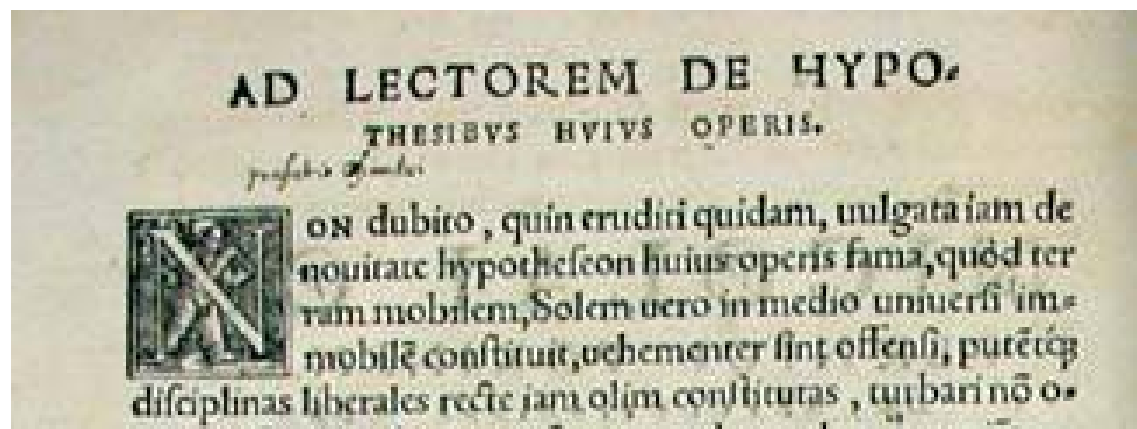 Verifiable and metaphysics-free descriptions (**Carnap**).

  Falsifiable and w/any luck unfalsified theories (**Popper**)

  True or approximately true explanations (**Putnam**)

- Arguably, these proposals are reflected in various scientific debates over the course of history.

  Osiander: "For it is not necessary that these hypotheses be true, nor even probable, but this alone is sufficient, if they show reasoning fitting the observations" (Preface, *De Revolutionibus Orbium Coelestium*).

Further values

- The following are also known as 'theoretical' or 'extra-empirical' or 'super-empirical' values or virtues.

- They include at least some of the following (if not more):

  * internal and external consistency
  * precision (a.k.a. 'depth')
  * scope (a.k.a. 'breadth' or 'comprehensiveness')
  * unification
  * simplicity
  * fertility (a.k.a. 'novelty')
  * non-ad hoc-ness

  NB: Prediction and explanatory power may also appear.

Values and 'theory choice'

- These values can be used to make help decide:

  * between rival theories
  * how to construct new theories
  * how to modify existing ones.

- Three ways to interpret the values:

  epistemic: meant to be good guides to the truth.

  pragmatic: meant to offer merely practical benefits.

  aesthetic: meant to be, in some sense, merely pleasing.

Internal vs. External Values

Values: internal and external

- **Internal (or 'intrinsic')**: "... directed on the very content of the theories and hypotheses" (Nola and Sankey 2007: 32).

  NB: A.k.a. 'epistemic', 'cognitive' and 'theoretical virtues'.

  Examples: simplicity, unification, etc.

- **External (or 'extrinsic')**: "... not directly concerned with the content of the science" (ibid.).

  NB: A.k.a. 'non-epistemic' and 'non-cognitive'.

  Examples: ethical, social and political values like increasing productivity, winning wars and protecting the environment.

Scientific detachment

- The distinction seems to be in harmony with the idea that we should be aware of outside influences on science.

- Not only that but such influences need to marginalised if science is to be impartial.

  "Should a sociologist, when studying child abuse or homelessness, say that child abuse or homelessness is wrong? Max Weber thought not. At the 1909 meetings of the Social Policy Association, he argued that sociology should be a science and a science must be silent on questions of right and wrong" (Root 2007, p. 42).

Entry points for values

- According to Weber, there are four potential entry points for (external) values in science.

  a) Research question choice
  b) Collection and evaluation of evidence
  c) Decision to accept evidence or theory
  d) Application of results to the world

- The first and last of these are the least controversial. We all know that in such cases values (and interests) play a role.

  Examples:
  * Research into fusing atoms together ➔ 'unlimited' energy.
  * Second-most effective drugs against a disease ➔ cheaper.

15

External values compromising research

- What's more controversial is whether external values and interests affect what we called the 2nd and 3rd entry points.

  Examples (ideological):
  * Relativity theory considered 'Jewish physics' by Nazis.
  * Soviet biology conflicted with 'individualistic' Darwinism.
  * Racial superiority theories in psychology.

  Examples (commercial benefit):

Research	On behalf of
* Cancer	Tobacco companies
* Climate change	Oil companies
* Drug efficiency and safety	Pharmaceutical companies

The social context of science

- Scientists, qua human beings, endorse political, ethical, social and aesthetic beliefs and values.

- After all, they ply their trade in the social arena where they:

  * are employees of collectively-governed institutions

  * get funded by collectively-governed bodies

  * conduct research as members of large teams

  * get their work evaluated by the scientific community

The value-free ideal

- Is science, its content and methods, affected by social factors (broadly speaking: values)? Should it be?

- The traditional answer has been that *good* science does not bend its content and methods to external values.

- It is branded the 'value-free ideal' (VFI) because it portrays science as free from the sway of external values.

18

Some dissenting voices

- "[...] the vain hope of discovering truth in a form which is independent of an historically and socially determined set of meaning will have to be given up" (Mannheim 1929: 71).

  "By itself a given sentence is neither a fact nor a fiction; it is made so by others" (Latour 1987: 25).

  "We do not conceive of scientists using various strategies as pulling back the curtain on pregiven, but hitherto concealed truth. Rather, objects (in this case, substances) are constituted through the artful creativity of scientists" (Latour and Woolgar 1986: 129).

Douglas' Critique of the VFI

Repudiating the value-free ideal

- Douglas (2009) argues that values penetrate, and ought to do so, far deeper into the scientific process than first imagined.

- She thus rejects the VFI and the distinction between epistemic (internal) and non-epistemic (external) values.

- Indeed, she argues that if the distinction fails then so does VFI because the latter rests on the former.

A fluid understanding of values

- Following others, Douglas claims that it is a mistake to strictly demarcate between kinds of values.

- In her view, the main argument against the crispness of the epistemic vs. non-epistemic values distinction is that:

  "... epistemic values end up reflecting the nonepistemic values of the day. An example... would be the theological views on the role of randomness in the universe that underlay the Bohr-Einstein debate. The social or cultural values that shaped Bohr's or Einstein's theological views then acted as guides for epistemic choice, thus operating as epistemic values" (p. 90).

22

Three categories

- Even so, she takes the following three (permeable) categories to be useful in the practice of science.

  Ethical: good and right, weighing benefits and harms, etc.

  Example: no experimentation w/out prior informed consent.

  Social: justice, privacy, freedom, social stability, etc.

  Example: fighting malaria as it primarily afflicts the poor.

  Cognitive: simplicity, explanatory power, scope, etc.

  Example: complex theories are harder to handle.

23

Cognitive *values* and epistemic *criteria*

- She then stresses the importance of distinguishing cognitive values from epistemic criteria.

  "[epistemic criteria] are about the ultimate goal of research, which is true (or at least reliable) knowledge" (93).

  Criteria: internal consistency and predictive competence.

  Example: If a theory is *not* predictively competent, i.e. if its predictions come out false, then it is clearly not reliable.

- Epistemic criteria, in her view, are minimal requirements for acceptable science (vs. aiding judgments in science).

24

The indirect role of values

- Following Heil (1983), Douglas considers a distinction of the roles values play as much more illuminating about science.

- **Indirect role**: Values affect all stages of the scientific process by *helping to decide the sufficiency of evidence*.

- Otherwise put, where there is uncertainty, values can be used to determine how much evidence is enough.

  Example: potentially harmful drug (more) vs. hair-tonic (less).

  <u>NB</u>: The more evidence available the less important this role.

The direct role of values

- **Direct role**: Values affect (virtually all) early stages of the scientific process by *acting as evidence* for /against decisions.

  By early stages, Douglas means those where the questions and methodologies to be pursued get decided.

  NB: These roughly correspond to Weber's entry points (a) and in part (b).

  Example: review board may reject a method as too risky.

- Why *virtually all*? Because she excludes cases where the values are used to predetermine the outcome of a study.
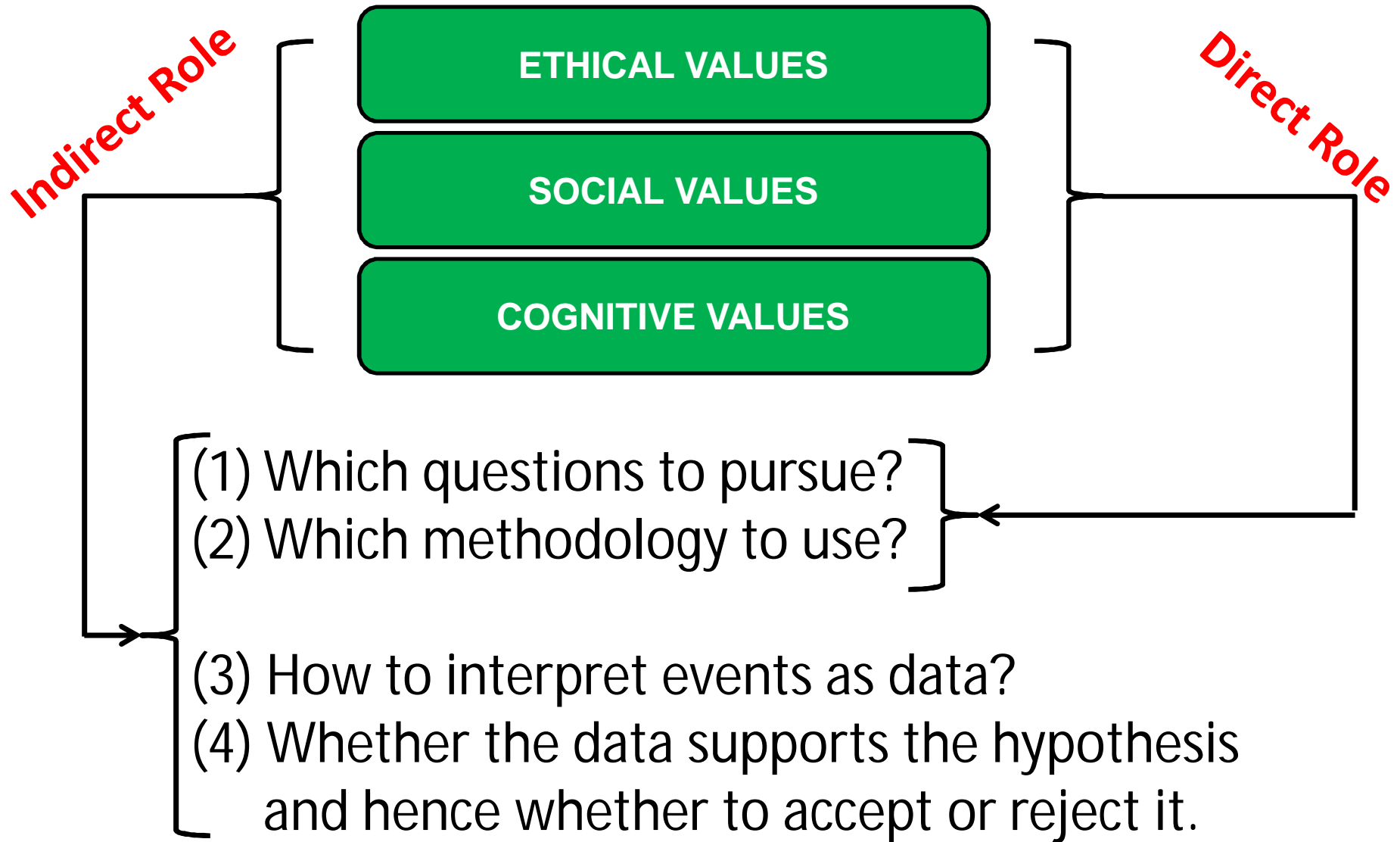
26

- What about the later stages of the scientific process?

  "Once the study is under way, any direct role for values must be restricted to unusual circumstances" (101).

  An exception, for example, is when in a medical study some unexpected adverse effects are detected.

- Why do we exclude a direct role of values in later stages?

- Because otherwise we would let value-driven bias into the interpretation of data and its use to (dis-/)confirm theories.

Objection: Science and policy in divergence

- A controversial aspect of this proposal is the indirect role values can play in later stages of the scientific process.

- Douglas reasons that sometimes there is urgency to act and values can help in the absence of sufficient evidence.

- Yet it is not clear why we cannot simply:

  (i) suspend judgement in relation to the scientific question.

  (ii) issue a judgement in relation to the practical question.

  NB: This is inspired by Levi (1967) who distinguishes between accepting a proposition and acting on it.

The End