Conceptions of Information within Philosophy

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The notion of information is associated with many central concerns of philosophy. Particular interest in information from within philosophy includes:

1. Investigation into its conceptual nature.
2. Applying conceptions of information to philosophical issues. For example, how can information play a role in accounts of knowledge (epistemology)?
3. Informational descriptions/interpretations of topics within areas of philosophy. For example, informational semantics for logic.
4. Information ethics.

- Furthermore, conceptions of information within other disciplines such as biology and physics can and have been of interest within philosophy.
- With the advent of the modern 'Information Age', information has increasingly come to be seen as an important and useful notion within philosophy. This has reached a point where the philosophy of information has been 'staked'.
- Semantic Conceptions of Information entry in Stanford Encyclopedia of Philosophy (http://plato.stanford.edu/entries/information-semantic/)

- Weaver [1949] offered the following tripartite analysis of information
  - technical aspects concerning the quantification of data (information) and dealt with by MTC and AIT
  - semantic aspects
  - pragmatic aspects

Grice on Meaning

- 'Meaning'. *The Philosophical Review*, 1957
- Natural meaning - Those spots mean measles
- Non-Natural meaning - Those three rings on the bell (of the bus) mean that the bus is full.

Semantic Information

Semantic information $=$ meaningful data. **GDI**: X is an instance of information, understood as semantic content, if and only if:

1. X consists of data
2. The data are well-formed
3. The data are meaningful

Semantic Information

- Two types: (1) Factual (2) Instructional
- Examples of Factual - Encyclopaedias, maps, traffic signs, weather reports
- Examples of Instructional - Recipes, sheet music
- Reduce instructional to factual
- Identify factual semantic information with propositions. 'Snow is white' and 'La neve e' bianca' are the same information.

Semantic Information - Questions

- Materiality of information
  - There can be no information without data representation.
  - There can be no data representation without physical implementation.
  - $\therefore$ There can be no information without physical implementation.
- But propositions are immaterial entities. If subscribing to the above, then perhaps identify information I with tuple (X, Y), where X is a proposition and Y is a physical representation corresponding to that proposition.
  - $I_1 = (X_1, Y_1)$
  - $I_2 = (X_2, Y_2)$
  - If $X_1 = X_2$ then $I_1 = I_2$

Semantic Information - Questions

- Alethic nature of information, veridicality thesis
- Quantifying semantic information
  - probabilistic approach
  - truthlikeness approach
- Informativeness
- Relevance

Environmental Information

- Two systems *a* and *b* are coupled in such a way that *a*'s being (of type, or in state) *F* is correlated to *b* being (of type, or in state) *G*, thus carrying for the information agent the information that *b* is *G*.
- E.g. Smoke carries the information that there is fire, tree rings carry the information that a tree is of a certain age
- Information *that* is factive. If *A* carries the information that *B*, then if *A* occurs then *B*.

Semantic Information and Environmental Information

- Sometimes coupled, E.g. Working traffic lights, Working clock
- Sometimes one without the other, E.g. Venus flytrap, Broken clock
- Combining the two gives strong information with epistemological import

Environmental Information Analyses

- **Inverse Conditional Probability** - A signal r carries the information that s is F = The conditional probability of s's being F, given r (and k), is 1 (but, given k alone, less than 1) (Drestske)

- **Counterfactual** - x's being F carries information about y's being G if the counterfactual conditional $\ulcorner$if y were not G, then x would not have been $F\urcorner$ is non-vacuously true.

- Situation Theoretic account (systemic)

- Modal account

Environmental Information Analyses

- Logical properties of information flow
- $A \sqsupset B =_{df} A$ carries the information that B
- $A \sqsupset B \vdash A \sqsupset B$
- $A \sqsupset B \vdash \neg B \sqsupset \neg A$ (Contraposition)
- $A \sqsupset B, B \sqsupset C \vdash A \sqsupset C$ (Transitivity)
- $A \sqsupset B \vdash A \wedge C \sqsupset B$ (Monotonicity)

Environmental Information Analyses

- Do these conditions hold universally? Well, in one sense they do, in another sense they don't.

-    1. the doorbell is short circuited *carries* the information that the doorbell is ringing
     2. the doorbell is ringing *carries* the information that someone is at the door
     3. the doorbell is short circuited *does not carry* the information that someone is at the door

- Need to employ a flexible framework. Relevant alternatives, contextualism.

Informational Epistemology

- JTB account of knowledge and Gettier examples
- K knows that s is F = K's belief that s is F is caused (or causally sustained) by the information that s is F. (Dretske)
- Failure of information/knowledge closure, Zebra example.