VT
The Future of the History of Philosophy

Barry Smith

http://philosophhome.org/
Unification of multi-species vertebrate anatomy ontologies for comparative biology in Uberon

Melissa A Haendel, James P Balhoff, Frederic B Bastian, David C Blackburn, Judith A Blake, Yvonne Bradford, Aurelie Comte, Wasila M Dahdul, Thomas A Dececchi, Robert E Druzinsky, Terry F Hayamizu,
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- Links to full-text articles found in PubMed Central or at publisher web sites, and other related resources.

tagging literature with ontology terms

RB Reis, GS Ribeiro, RDM Felzemburgh, et al., Impact of Environment and Social Gradient in Leptospira Infection in Urban Slums

Introduction

At present, one billion of the world's population resides in slum settlements [1]. This number is expected to double in the next 25 years [1]. The growth of large urban populations which are marginalized from basic services has created a new set of global health challenges [2],[3]. As part of the Millennium Development Goals [4], a major priority has been to address the underlying poor sanitation and environmental degradation in slum communities which, in turn, are the cause of a spectrum of neglected diseases which affect these populations [2],[3],[5].

Leptospirosis is a paradigm for an urban health problem that has emerged due to recent growth of slums [6],[7]. The disease, caused by the Leptospira spirochete, produces life-threatening manifestations, such as Weil's disease and severe pulmonary hemorrhage syndrome for which fatality is more than 10% and 50%, respectively [7]-[9]. Leptospirosis is transmitted during direct contact with animal reservoirs or water and soil contaminated with their urine [8],[9]. Changes in the urban environment due to expanding slum communities has produced conditions for rodent-borne transmission [6],[10]. Urban epidemics of leptospirosis now occur in cities throughout the developing world during seasonal heavy rainfall and flooding [6],[11]-[18]. There is scarce data on the burden of specific diseases that affect slum populations [2], however leptospirosis appears to have become a major infectious disease problem in this population. In Brazil alone, more than 10,000 cases of severe leptospirosis are reported each year due to outbreaks in urban centers [19], whereas roughly 3,000, 8,000 and 1,500 cases are reported annually for meningococcal disease, visceral leishmaniasis and dengue hemorrhagic fever, respectively, which are other infectious diseases associated with urban poverty [20]-[22]. Case fatality (10%) from leptospirosis [19] is comparable to that observed for meningococcal disease, visceral leishmaniasis and dengue hemorrhagic fever (20%, 8% and 10%, respectively) in this setting [20],[23],[24]. Furthermore, leptospirosis is associated with extreme weather events, as exemplified by the El Niño-associated outbreak in Guayaquil in 1998 [25]. Leptospirosis is therefore expected to become an increasingly important slum health problem as predicted global climate change [26],[27] and growth of the world's slum population [1] evolves.

Urban leptospirosis is a disease of poor environments since it disproportionately affects communities that lack adequate sewage systems and refuse collection services [6],[10],[11]. In this setting, outbreaks are often due to transmission of a single serovar, L. interrogans serovar Copenhageni, which is associated with the Rattus norvegicus reservoir [6],[28]-[30]. Elucidation of the specific determinants of poverty which have led to the emergence of urban leptospirosis is essential in guiding community-based interventions which, to date, have been uniformly unsuccessful. Herein, we report the findings of a large seroprevalence survey performed in a Brazilian slum community (favela). Geographical Information System (GIS) methods were used to identify sources for Leptospira transmission in the slum environment. Furthermore, we evaluated whether relative differences in socioeconomic status among slum residents contributed to the risk of Leptospira infection, in addition to the attributes of the environment in which they reside.

http://www.ploscompbiol.org/article/info:doi/10.1371/journal.pcbi.1000361
tagging genomic data with ontology terms

age-dependent behavioral decline

sphingolipid transporter activity

Holliday junction helicase complex
tagging databases with ontology terms

**MouseEcotope**

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**GlyProt**

- 3.6G (c) Gastrointestinal lumen
- BROS (a) Renal cortex (90% of the cell mass is kidney)
- gastroenteric wall of the mouse
- CIC (c) Intestinal microfold
- CIC (c) Bile ducts (proximal and distal)
- DiabetInGene (c) Bile ducts (proximal and distal)
- GluChem (c) Bile ducts (proximal and distal)
- sphingolipid transporter activity

**DiabetInGene**

- 3.6G (c) Gastrointestinal lumen
- BROS (a) Renal cortex (90% of the cell mass is kidney)
- gastroenteric wall of the mouse
- CIC (c) Intestinal microfold
- CIC (c) Bile ducts (proximal and distal)
- DiabetInGene (c) Bile ducts (proximal and distal)
- GluChem (c) Bile ducts (proximal and distal)
- sphingolipid transporter activity

**GluChem**

- 3.6G (c) Gastrointestinal lumen
- BROS (a) Renal cortex (90% of the cell mass is kidney)
- gastroenteric wall of the mouse
- CIC (c) Intestinal microfold
- CIC (c) Bile ducts (proximal and distal)
- DiabetInGene (c) Bile ducts (proximal and distal)
- GluChem (c) Bile ducts (proximal and distal)
- sphingolipid transporter activity
fosters discoverability of information
coordinated tagging of literature and data
allows

- discovery of data and literature
- logical reasoning over data
- integration of data
- cross-disciplinary collaboration

The approach can be applied in all areas; all we need is the corresponding consensus-based ontologies and a huge investment in tagging
http://bioportal.bioontology.org/ontologies/1666
The Emotion Ontology
Types of appraisal in the Emotion Ontology

- 'appraisal of social attention'
- 'appraisal of causal intent'
- 'appraisal process'
- 'appraisal of avoidability of...'
- 'appraisal of suddenness'
- 'appraisal of desirability of...'
- 'appraisal of urgency of resp...'
- 'appraisal of familiarity'
- 'appraisal of loss'
- 'Cognitive Representation'
Types of feeling in the Emotion Ontology
Types of Physiological Response to Emotion

- Breathing at a more rapid rate
- Muscles becoming tense
- Muscles relaxing
- Experiencing discomfort in the chest
- Blushing
(Part of) the biochemical **basis** of emotion is in ChEBI.

Emotions are effected in part by **neurotransmitters** such as dopamine, tryptophan.
Biological processes in affective disorders

Some mental diseases involve altered emotional functioning (e.g. depression, bipolar disorder)

Mechanism of action: complex disturbances in underlying systems

down-regulation of dopaminergic system (GO:0032227)

realized in

has part

Disposition

Process

mental disease

emotion

biological process

depression

non-canonical sadness
Top Level of the Emotion Ontology

BFO:Entity

BFO:Continuant
  - BFO:Independent Continuant
  - BFO:Dependent Continuant

BFO:Occurrent

BFO:Process
  - Physiological Response to Emotion Process
  - Bodily Process
  - Mental Process
    - Appraisal Process
    - Emotional Behavioural Process

Organism

inheres_in

BFO:Disposition

Cognitive Representation
  - Affective Representation
    - Subjective Emotional Feeling

Appraisal

has_part

is_output_of

agent_of

Emotion Occurrent
Dancing with the Ontological Engineers

WERNER CEUSTERS
AND BARRY SMITH

A certain measured, cadenced step, commonly called a “dancing step”, which keeps time with, and as it were beats the measure of, the Music which accompanies and directs it, is the essential characteristic which distinguishes a dance from every other sort of motion.

Adam Smith (1980, 207)
a “half cut” in Irish Sean-nós dancing
a short movement of one lower leg crossing the other leg with the foot pointing outward

• part of a mannequin’s step on the catwalk
• an epileptic jerk
• the kicking of a ball by a soccer player
• a signal (“Get out!”) issued in heated conversation
Foundational Model of Anatomy (Leg Ontology)

is_a hierarchy
Ontologies deal with types

names for types are used to tag data about instances
Discoverability

• How to find choreography, videos, dress patterns, music scores, descriptions from the social pages relating to the 17th-century English *quadrille* precursors of the 20th-century Apallachian square dance?

The earlier “folklore” model supported scholars and institutions in documenting and preserving a record of disappearing traditions. The more recent model aims to sustain a living tradition by supporting the conditions necessary for cultural reproduction.
Answer: build the *danceome*

= a collection of all the data we have pertaining to

- dance journalism, fiction, history, biographies of dancers and of dance impressarios, programs ...
- paintings, photographs, videos, dress patterns, museum artifacts ...
- choreographical scores ...
build a Dance Ontology

combine it with a Music Ontology, a Dress Ontology, a Body Part Ontology, Body Part Movement Ontology, Emotion Ontology ... use the result to annotate the danceome

create the empirical basis for a history of dance
What is the philosophohome?

A collection of data and literature relating to

– people
– publications, editions
– sociology
  • schools
  • movements
  • places
  • organizations
  • surrounding cultural and historical events
– ideas, examples and counterexamples, arguments and counterarguments, evidence ...
What is the philosophe?  
A collection of data and literature relating to

– people

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  • schools
  • movements
  • places
  • organizations
  • surrounding cultural and historical events

– ideas, examples and counterexamples, arguments and counterarguments, evidence ...
The Philosophy Family Tree

An academic genealogy of philosophers

Only one type of link: is_Doktorvater_of

• as wiki
• as indented list
• as linked graph

The largest (and longest) chain of links begins with Leibniz

140,000 entries

From 1930 onwards overwhelmingly German Anglo-Saxon
The Philosophy Family Tree

An academic genealogy of philosophers

Only one type of link: *is_Doktorvater_of*

- as wiki
- as indented list
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The largest (and longest) chain of links begins with Leibniz

140,000 entries

From 1930 onwards overwhelmingly German

Anglo-Saxon Anglo-Saxophone
as wiki (still working)

http://philosophyfamilytree.wikispaces.com
The Philosophy Family Tree as tabbed list

Leibniz lineage includes also Wolff, Kant, Brentano, Ingarden, Tarski, Chisholm, Peter H. Hare ...
Mencke lineage includes also Weierstrass, Husserl, Hilbert, Russell, Carnap, Fodor, Hempel, Nozick, David Hershenov, ...
1. root

2. Christian Hermann Weisse 1801-1866

3. Hermann Lotze

4. James Ward

5. George Edward Moore

6. Richard Braithwaite

7. Stephen Toulmin

7. Stephen Korner

7. Wolfe Mays 1944 -

8. Kevin Mulligan

8. Barry Smith

8. Peter Simons

Weisse lineage includes also Russell, Whitehead, Wittgenstein, Quine, David Lewis, Cornel West, ...
1. Root

2. Jean-le-Rond D'Alembert 1735 -
3. Étienne Bonnot de Condillac
4. Pierre Laromiguere
5. Victor Cousin
6. Jean Ravaission-Mollien
7. Jules Lachelier
8. Lucien Levy-Bruhl
9. Etienne Gilson
10. A.A. Maurer
11. J. J. E. Gracia

D'Alembert lineage
as linked graph

http://ontology.buffalo.edu/philosophome/philmap.pdf

http://people.cohums.ohio-state.edu/scharp1/ Diagrams
Foundational Model of Anatomy (Leg Ontology)

*is_a hierarchy*
*part_of hierarchy*
What would an ontology of philosophy look like?
cellular physiological process

- cell cycle
- meiotic cell cycle

- cell division

child: cytokinesis
parent: cell division
the *is_a* ontology traffic rule

everything true of an *is_a* parent term is also true of all its children

female body *is_a* body

*everything true of body is also true of female body*

free lower limb *is_a* limb

leg *is_a* free lower limb

left leg *is_a* leg
an index does not need to follow this rule

cancer
cancer documentation
cancer hospital
cancer therapy
cancer (astrological sign)
Categories and Editors

Welcome to the PhilPapers Bibliography, the most comprehensive bibliography of philosophy. The bibliography currently contains over 2,016,615 entries. Here is a complete listing of categories and editors.

**General Editors**

David Bourget (University of Western Ontario)
David Chalmers (Australian National University; New York University)

Assistant General Editor: Steve Pearce (UWO)

**Areas and Area Editors**

**Metaphysics and Epistemology**

- Epistemology (Matthew McGrath)
- Metaphilosophy (Jonathan Jenkins Ichikawa)
- Metaphysics (Jonathan Schaffer)
- Philosophy of Action (Constantine Sandis)
- Philosophy of Language (Berit Brogaard)
- Philosophy of Mind (David Chalmers, David Bourget)
- Philosophy of Religion (Thomas Senor)

**Value Theory** (Daniel Star)

- Aesthetics (Rafael De Clercq)
- Applied Ethics (Ezio Di Nucci)
- Meta-Ethics (Daniel Star)
- Normative Ethics (Jussi Suikkalanen)
- Philosophy of Gender, Race, and Sexuality (Lynne Tirrell)
- Philosophy of Law (Aness Webster)
- Social and Political Philosophy

http://philpapers.org/
All categories and editors

Visit a category to apply for an editorship.
Categories marked with a * are links to categories in other areas.

Metaphysics and Epistemology (140,914)

Epistemology (14,688) Matthew McGrath

Epistemological Sources (1,182 | 7) Joachim Horvath

The A Priori (355 | 22) Joachim Horvath

Apriority and Necessity (89)

Apriority in Mathematics* (34) Alexander C. R. Oldemeier

Conceptual Analysis* (144) Joachim Horvath

Modal Rationalism* (28) Anand Vaidya

Moral Rationalism* (70) Christopher Michael Cloos

Rationalism* (92 | 74) Magdalena Balcerak Jackson

The A Priori, Misc (121) Joachim Horvath

The Synthetic A Priori (40)

Theories of the A Priori (83) Joachim Horvath

Intuition (250 | 27) Ole Koksvik

Epistemology of Intuition (131) Ole Koksvik

Intuition, Misc (33) Ole Koksvik

this is not an ontology, it is an index
All categories and editors

Visit a category to apply for an editorship.
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The A Priori, Misc (121) Joachim Horvath

The Synthetic A Priori (40)

Theories of the A Priori (83) Joachim Horvath

Intuition (290 | 21) Ole Koksvik

Epistemology of Intuition (131) Ole Koksvik

Intuition, Misc (33) Ole Koksvik
what you get in PhilPapers when you search for ‘aging’

Brain Imaging
  Applied Ethics : Biomedical Ethics : Neuroethics

Aging
  Applied Ethics : Biomedical Ethics : Health Care Ethics

Feminism: Aging
  Phil of Gender, Race, and Sexuality : Feminist Phil : Topics in Feminist Phil
PhilPapers categories list

• includes ‘Searle’ – but only under ‘Searle’s biological naturalism’

• includes ‘taxonomy’ – but only under ‘psychiatric taxonomy’

• includes ‘institutions’ – but only under ‘economic institutions’
  ‘institutions of racism’

• does not include ‘individuality’

• does not include ‘individuation’
Welcome to the Indiana Philosophy Ontology (InPhO) project! We offer a variety of tools for students, researchers, programmers and scholars. The ontology currently covers philosophical ideas, thinkers, and journals.

**Philosophy Big Data**
The InPhO analyzes over 37 million words of philosophical content from:
- Stanford Encyclopedia of Philosophy

**Dynamic Ontology**
The InPhO is constructed by a novel 3-step semi-automated process, called dynamic ontology:

1. **Data Mining** — Natural language processing (NLP) techniques generate statistical hypothesis about the relationships among philosophical concepts.
Dynamic Ontology

The InPhO is constructed by a novel 3-step semi-automated process, called **dynamic ontology**:

1. **Data Mining** — Natural language processing (NLP) techniques generate statistical hypothesis about the relationships among philosophically-salient topics.

2. **Expert Feedback** — These hypotheses are evaluated by domain experts through online interfaces.

3. **Machine Reasoning** — Our machine reasoning program uses feedback and statistical measures to populate the ontology.
aesthetics and philosophy of art

- african and african-american philosophy
- arabic and islamic philosophy
- chinese philosophy

continental philosophy

- epistemology
- ethics
- feminist philosophy

history of philosophy
Latin American and Iberian Philosophy

Latin American and Iberian Philosophy can be searched on PhilPapers.

No data! The InPhO current contains no statistical information on Latin American and Iberian philosophy. This is likely a new concept for the ontology, and statistical information will be available after our nightly data mining. If this page continues to lack data, please inform us at inpho@indiana.edu.

latin american and iberian philosophy

logic
another important ontology traffic rule: don’t confuse ‘and’ with ‘or’

- african and african-american
- arabic and islamic philosophy
breaks the *is_a* rule

history of logic *is_a* logic
history of ethics *is_a* ethics
Christian Hermann Weisse

W Christian Hermann Weisse also has a Wikipedia article.

pp Christian Hermann Weisse can be searched on PhilPapers.

Birth Dates: August 10, 1801
Death Dates: September 19, 1866
Nationality/ethnicity: German
Profession: Philosopher

Related Terms
- Personalism
- Idealism
- Individuals
Christian Hermann Weisse

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Christian Hermann Weisse can be searched on PhilPapers.

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<th>Birth Dates:</th>
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<td>Profession:</td>
<td>Philosopher</td>
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**Related Terms**
- Personalism
- Idealism
- Individuals
Works by Christian Hermann Weisse

(view other items matching `Christian Hermann Weisse`, view all matches)

Did you mean: **Weiss, Christian Herman**

Nothing found.
another important ontology traffic rule:
don’t confuse: *is_a* and *instance_of*

capital city *is_a* [type of] city
Toronto *instance_of* city

**InPhO** says:
feminist philosophy of language
*instance_of* feminist philosophy
Instances

- Radical Feminism
- Feminist Interventions in Moral Psychology
- Feminist Interventions in the Philosophy of Law
- Feminist Interventions in the Philosophy of Religion
- Feminist Interventions in the Philosophy of Language
- Feminist Interventions in Environmental Philosophy
- Feminist Interventions in Epistemology
Feminist Interventions in Epistemology

Feminist Interventions in Epistemology can be searched on PhilPapers.

No data! The InPhO current contains no statistical information on feminist epistemology. This is likely a new concept for the ontology, and statistics are added after our nightly data mining. If this page continues to lack data, please contact inpho@indiana.edu.
Foundations of an ontology of philosophy

Pierre Grenon · Barry Smith

Abstract We describe an ontology of philosophy that is designed to aid navigation through philosophical literature, including literature in the form of encyclopedia articles.
relations in PhilOnto

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<td>-</td>
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What can we do with PhilOnto?
philosopher

instance_of
subtypes of philosopher

Philosopher_of_printmaking
Philosopher_of_sculpture
  (Aesthetician_of_sculpture)...
  Ethicist_of_sculpture
Philosopher_of_the_humanities
  Philosopher_of_history
  Philosopher_of_literature
    Aesthetician_of_literature
      Aesthetician_of_poetry
        Philosopher_of_poetry
          (Aesthetician_of_poetry)...
  Philosopher_of_religious_studies
Political_philosopher
Epistemologist
Fig. 1 The main kinds of entities in the domain of philosophy and examples of their instances.
Semantically enhanced publishing

Use PhilOnto controlled vocabulary for literature curation

• Advance discoverability of data
• Advance logical reasoning over data
• Advance integration of data
The ome of biology

MKVSDDRKFKEANFDEFEASALNNKNDLVHCPSITLFESIPTEVRSFYEDKSGLIKVKFRTAGMDRKRSEFEKVKVISVMGKN
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What shall serve as the *ome* for philosophy?
The future of the history of philosophy

ontology vs. index

creating an index (so that you can find some topic in a given work literature) is not a good way to create an ontology (which allows you to reason over the things the literature is about)

an index provides you with a guide only to this one piece of literature

an ontology allows you to link what is in this one piece of literature with what is in any other information resource
find me all the literature in which Kant, Hilbert and Plato are simultaneously mentioned

find me all the literature in which JJE Gracia, Kant and individuation are simultaneously mentioned

http://www.harzing.com/
### Results

- **Papers:** 1000
- **Citations:** 101761
- **Years:** 113
- **Cites/year:** 900.54
- **Cites/auth/year:** 703.11
- **h-index:** 102
- **g-index:** 311
- **hc-index:** 44
- **hI,annual:** 0.80
- **hI,norm:** 90

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# Immanuel Kant + racism

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individuation + scholasticism

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individuation + scholasticism (by year)

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Years: 109
annotate the entire philosophy family tree with information like this
third man argument

worked-on

Plato
generate new family subtrees for each philosophical concept

modal realism

worked-on
for each philosophical field

feminist philosophy of science

worked-on
for each philosophical group

Left Hegelians

member-of
for each epoch

600-500 BCE

worked-during
Western Philosophy of the 20th Century
Put all of these together and we can automatically get answers to queries such as:

- give me all the articles published between 1980 and 1990 in which Gettier’s paradox is discussed in connection with Goldman’s Barn
- give me a list of all the philosophical arguments formulated by Christian philosophers living in Baghdad in the 10th century
- give me a sublist which lists only those arguments which were formulated for the first time by members of this group
Scientific Evidence and Provenance Information Ontology (SEPIO)
Scientific Evidence and Provenance

Information Ontology (SEPIO)

**Assertion**
(e.g. ENIGMA's 'Breast cancer is caused by the BRCA1 2685T>A variant')

- `xsd:string` e.g. "2014-03-18"
- `xsd:string` e.g. "2015-12-10"
- `date_created`
- `date_last_updated`

- `1` output_of

**Assertion Process**

- `1` has_agent
- `1` is_specified_by
- `1` date/time

**Agent**
(e.g. 'ENIGMA')

**Assertion Protocol**
(e.g. 'ACMG guidelines')

**Proposition**
(e.g. 'Breast cancer is caused by the BRCA1 2685T>A variant')

- `1..m` is_expressed_in

**Evidence Line**

- `1` has_supporting_evidence

**Data**
(e.g. 'p-value')

- `1..m` is_evidence_supported_by
Evidence Line

is_evidence_supported_by

Data (e.g. 'p-value')

has_agent

Agent (e.g. 'Johnson Lab')

has_input

Resource (e.g. 'pLuc-sf9 plasmid')

has_part

Technique (e.g. 'luciferase reporter assay')

is_evidence_with_support_from

Data Generation Process

output_of

1..m

1

1..m
DARPA’s Big Mechanism Program
Defense Advanced Research Projects Agency