

# *Intelligence Analysis: Top-Down Part 2*

*John Beverley*

Assistant Professor, *University at Buffalo*  
Co-Director, National Center for Ontological Research  
Affiliate Faculty, *Institute of Artificial Intelligence and Data Science*

# *Outline*

- Real Patterns
- From Language to Speech Acts
- From Speech Acts to Document Acts
- Design Pattern Exercise

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- From Language to Speech Acts
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# *Pattern Recognition*

- We're disposed to recognize patterns with our perceptual faculties...



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- We're disposed to recognize patterns with our perceptual faculties...
- ...and with our cognitive faculties...

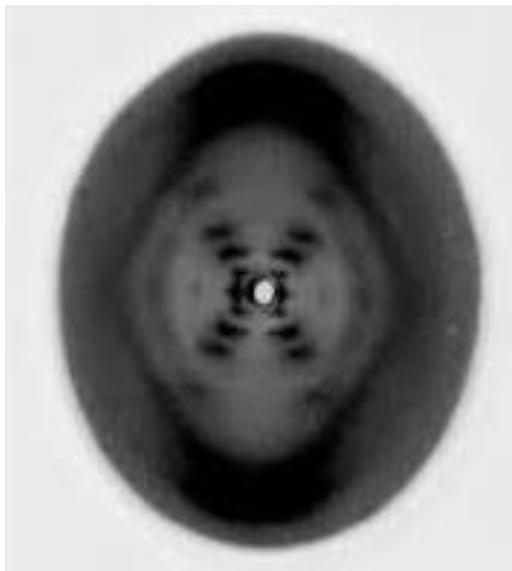
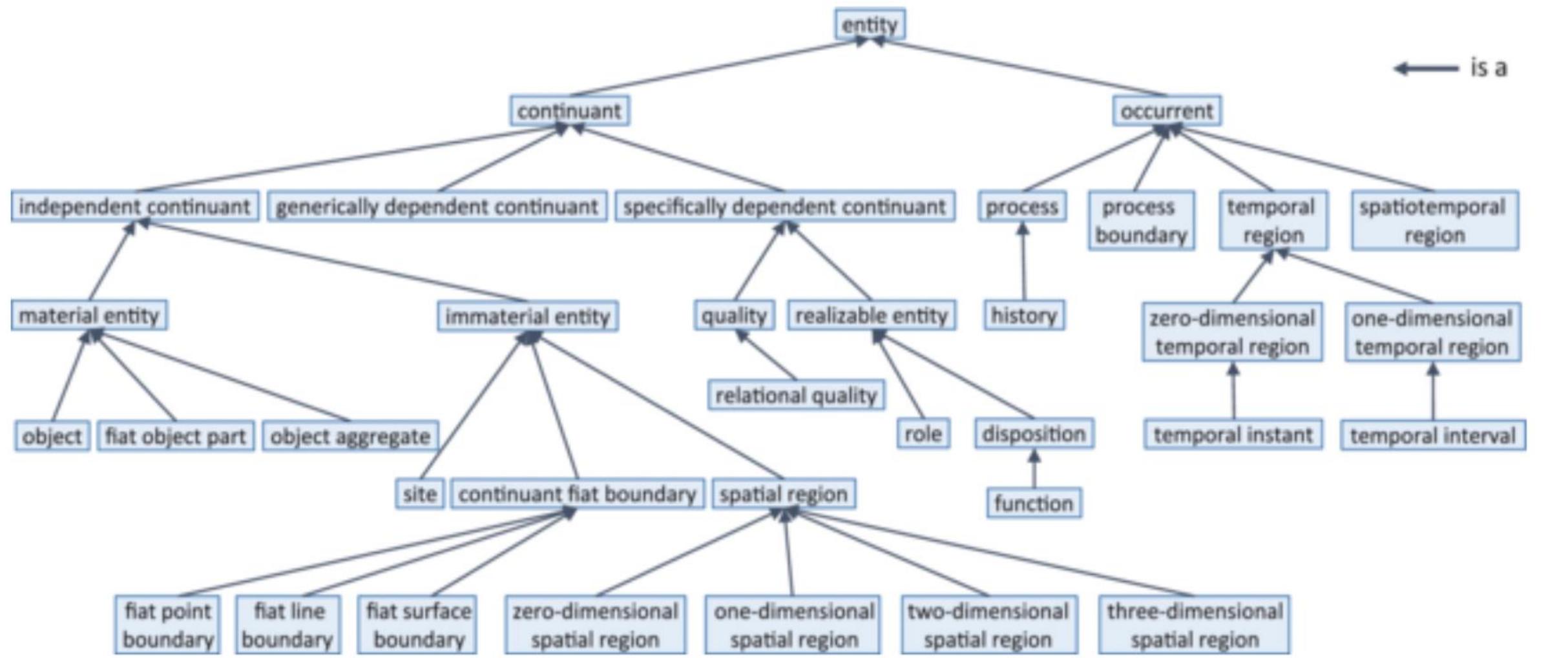


Photo 51 crystallography  
image by Rosalind

Double-helix hypothesized  
by Watson and Crick



# Patterns in Basic Formal Ontology?



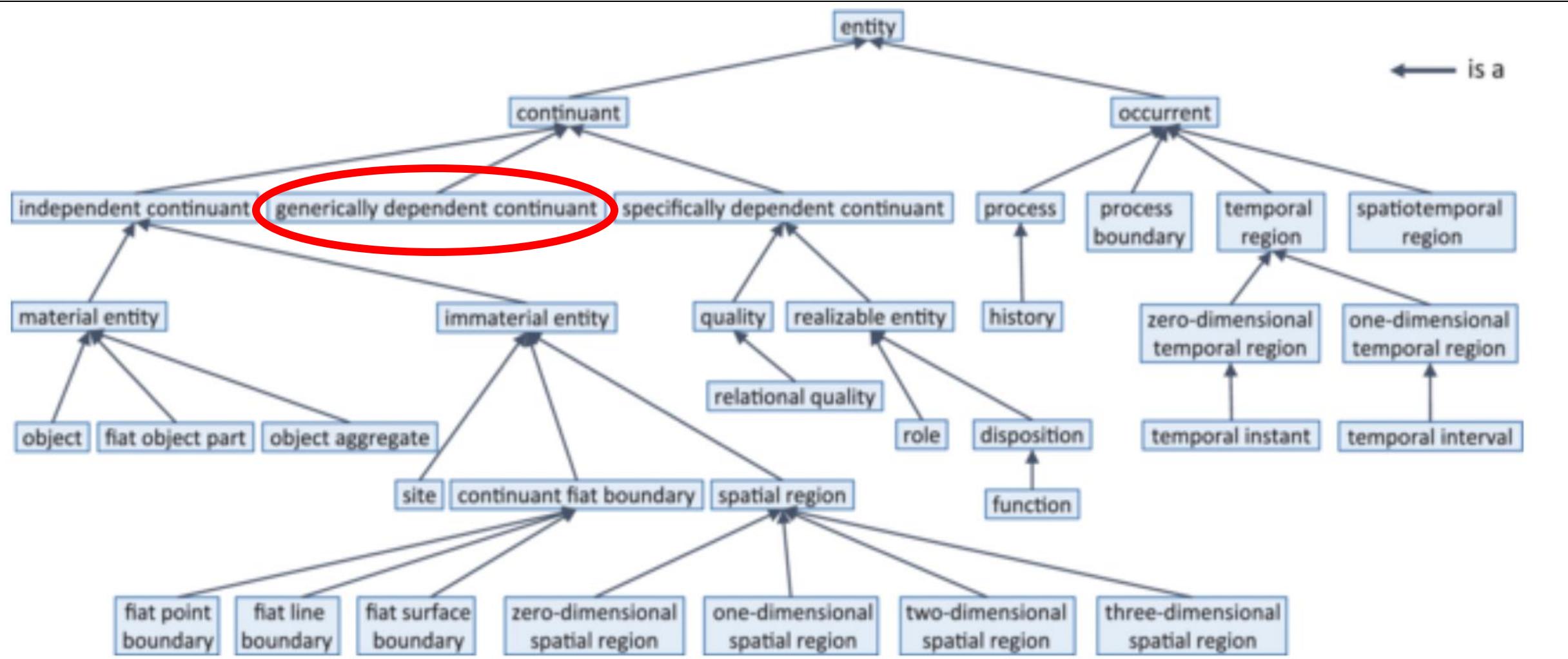
# *BFO 1.0*

- Earlier versions of BFO did not permit dependent entities to migrate from bearer to bearer
- This is true in current versions of BFO for many cases, e.g. your smile is dependent on your face
- Dependent entities that cannot migrate fall under the class **Specifically Dependent Continuant**

# *Patterns*

- A need arose to represent dependent entities that could migrate across bearers
- This need led to **generically dependent continuants**, continuants that are in some sense copyable, i.e. patterns
- For example, “Snow is white” and “Schnee ist weiß” may be used to express numerically identical content, i.e. the same pattern

# Patterns in Basic Formal Ontology



# *Real Patterns\**

- X is a real pattern just in case:
  - X is projectible under at least one physically possible perspective and
  - X encodes information about at least one structure of events or entities S where that encoding is more efficient, in information-theoretic terms, than the bitmap encoding of S, and where for at least one of the physically possible perspectives under which the pattern is projectible, there exists an aspect of S which cannot be tracked unless the encoding is recovered from the perspective in question.

\*Dennett and Ross

# *Real Patterns\**

- X is a real pattern just in case:
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  - ~~X encodes information~~ **is about at least one entity** ~~structure of events or entities S where that encoding is more efficient, in information-theoretic terms, than the bitmap encoding of S, and where for at least one of the physically possible perspectives under which the pattern is projectible, there exists an aspect of S which cannot be tracked unless the encoding is recovered from the perspective in question.~~

\*Loosely inspired by Dennett and Ross

# *Real Patterns*

- Some patterns are necessarily **about** something; some patterns are not
- “Snow is white” expresses content that is **about** snow
- “cm” or “.” are not necessarily **about** anything; they are nevertheless patterns
- Most generically dependent entities represented in BFO extensions are patterns that are **about** something

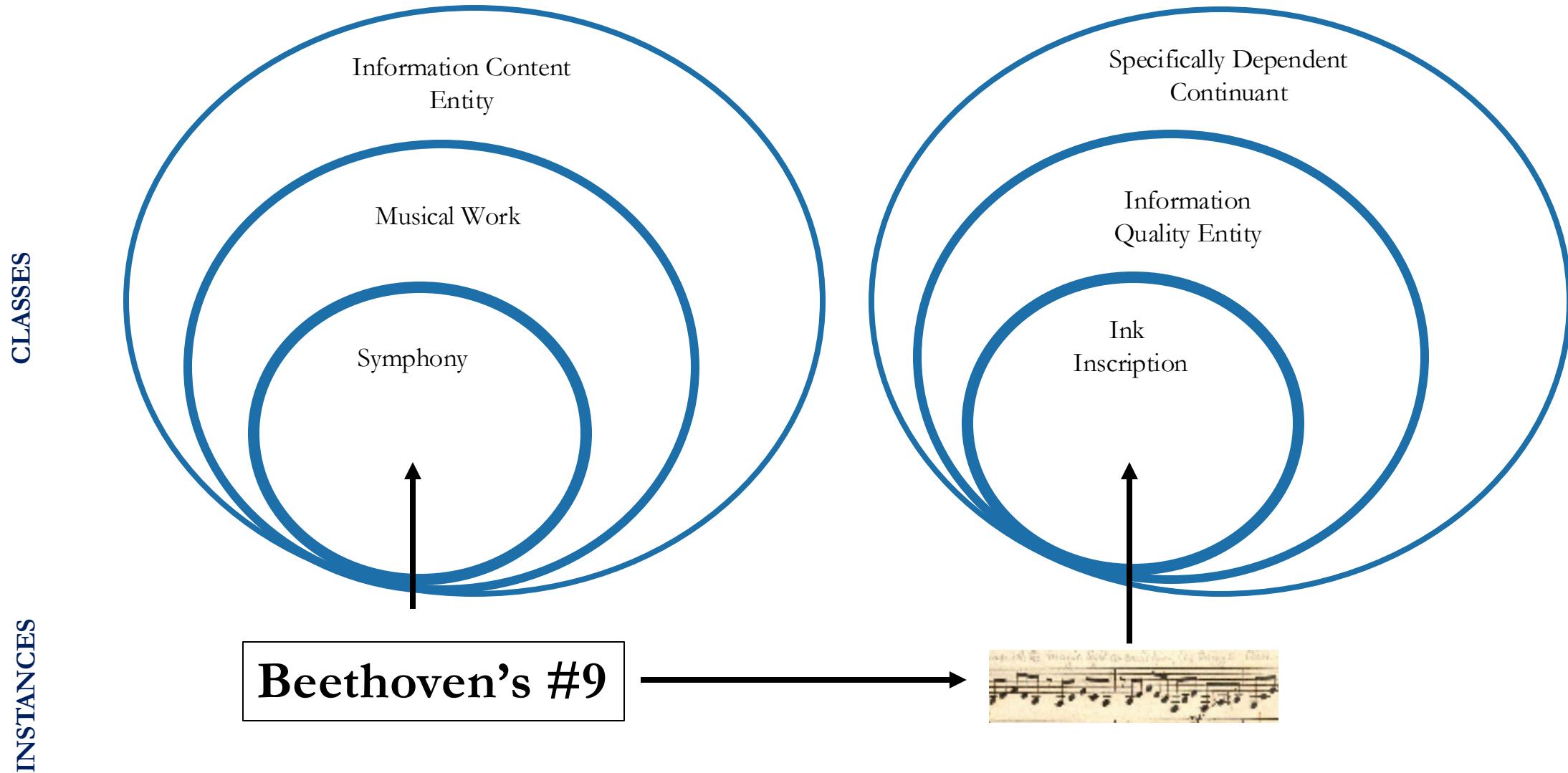
# *Aboutness*

- **Information** is a pattern that is **about** something
- In BFO extensions - such as the Information Artifact Ontology and the Information Entity Ontology - information is represented by the class **Information Content Entity**
- Where the “is about” relation is understood to be primitive:

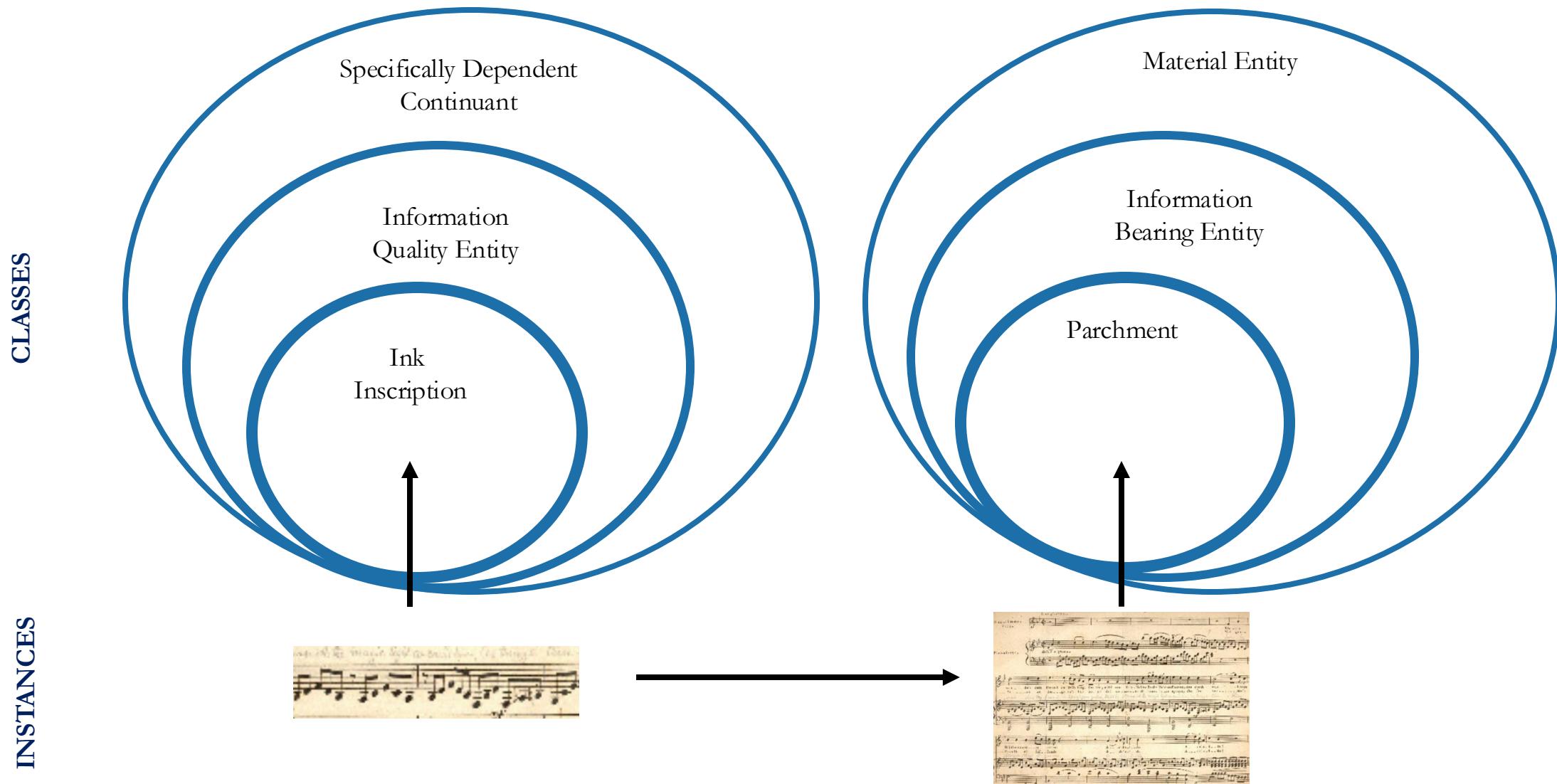
**definition** [language: en]

A primitive relationship between an Information Content Entity and some Entity.

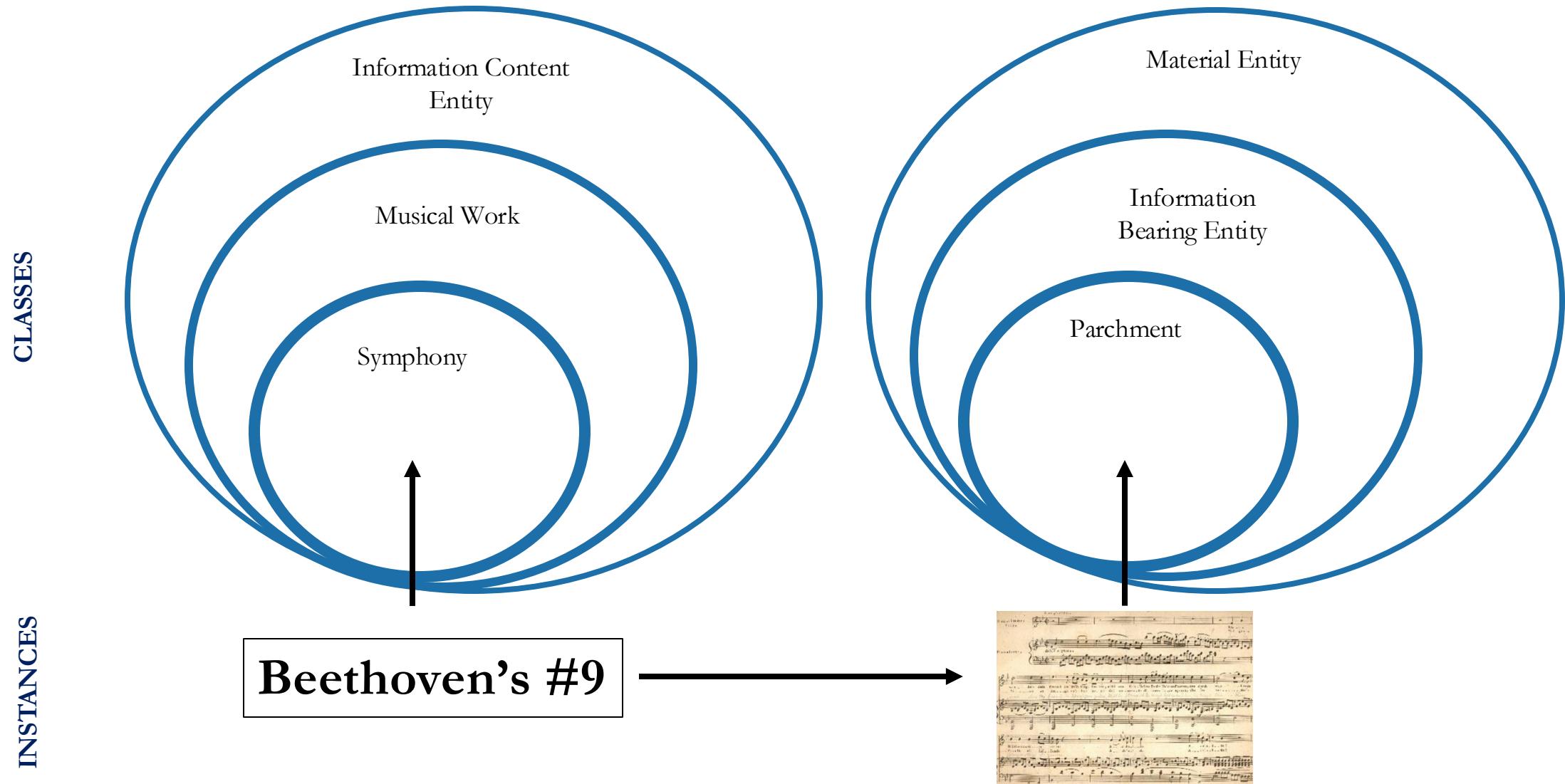
# #9 *Concretized in Ink Inscription*



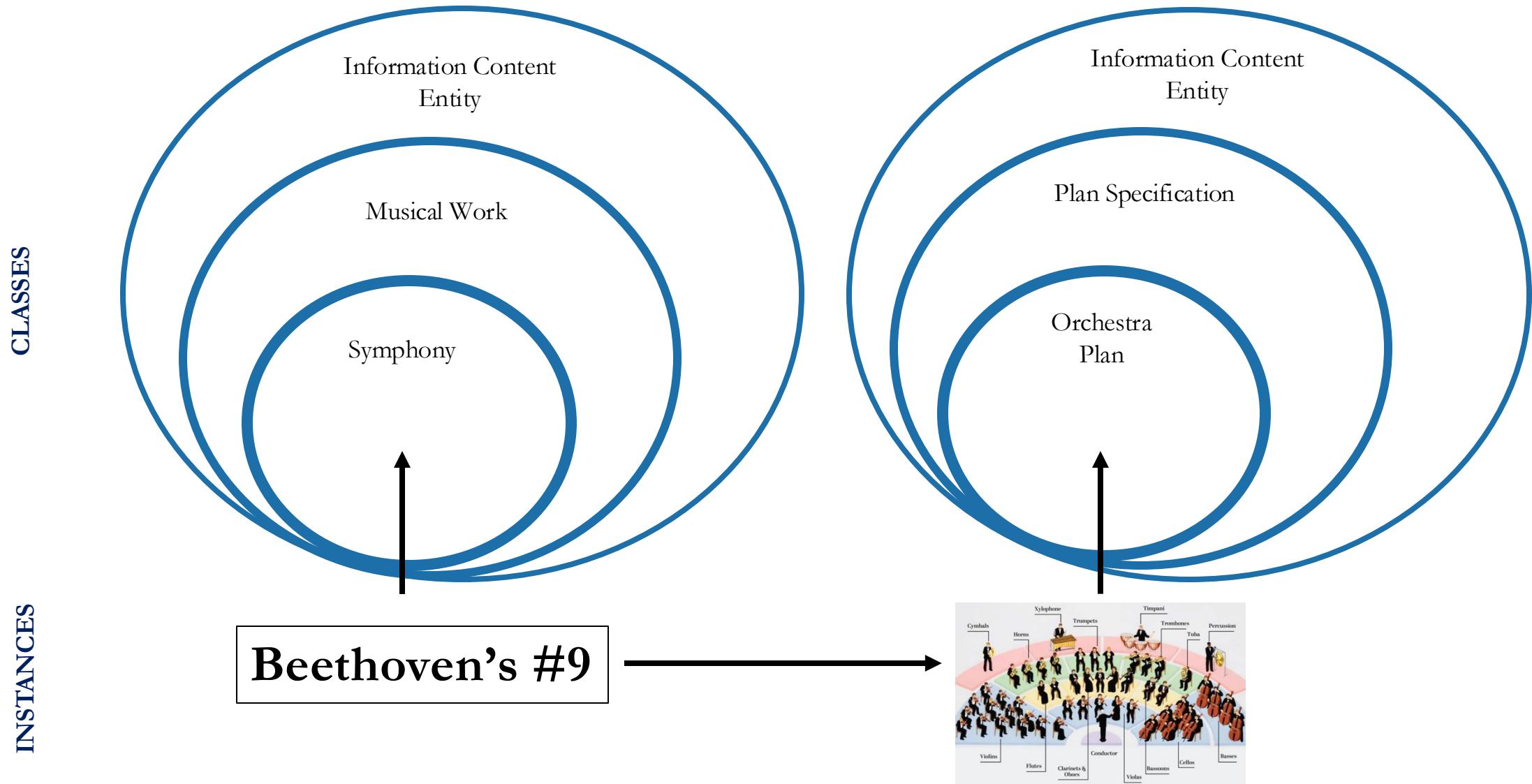
# *Ink Inscription inheres in Parchment*



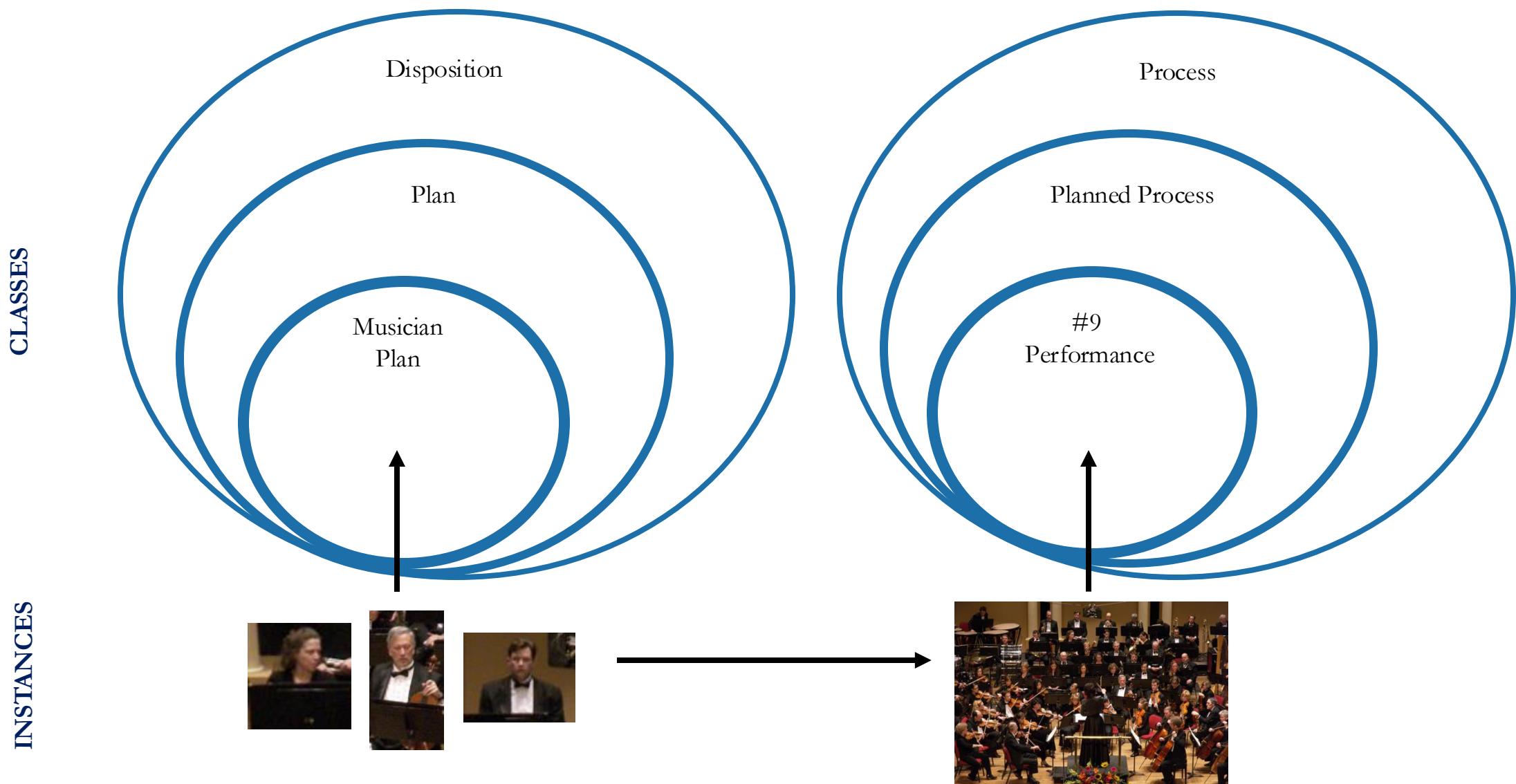
# #9 Generically Dependent On Parchment



# *#9 is about Orchestra Plan*



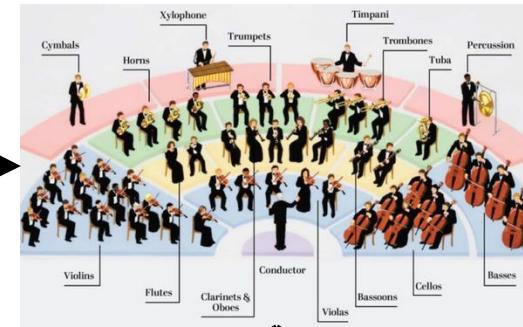
# *Musician Plan realized in #9 Performance*



# *Beethoven's #9<sup>th</sup> Symphony*

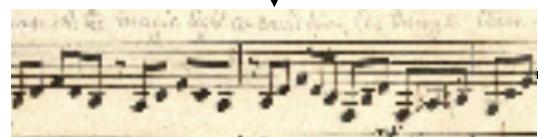
**Beethoven's #9**

*is about*



*generically  
depends on*

*concretized in*



*inheres in*



*has  
realization*



*concretized  
in*



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# *Authority*

- Many intelligence activities involve government agents and agencies, which have degrees of authority to direct and leverage intelligence
- Questions of authority emerge during mission failures and successes, checks and balances, rational historical reconstructions
- It is incumbent on us that we explore relationships between intelligence analysis and relevant authority

# *BFO: Deontic Entities*

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  - Social dispositions, e.g. customs, languages, rituals, institutions, etc.

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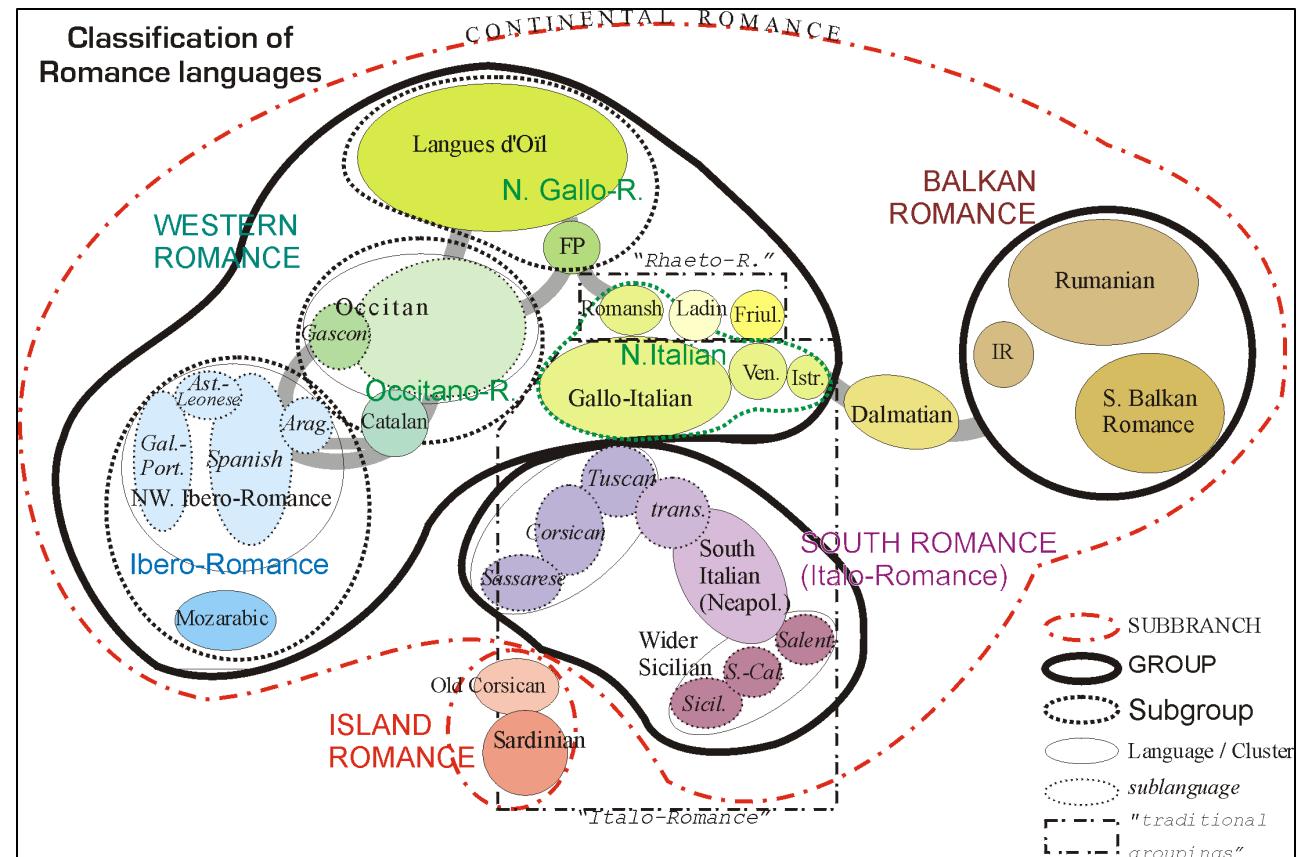
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# *Chomsky on E-Language*

- "Language" may mean the sociopolitical vernacular that we learn in our communities, i.e. **E-language**.
- E-Language is external, communal, changeable, and may be corrected. For example, the term "livid" means "cold, blue with anger" and yet most people seem to think it means "hot, red with anger."

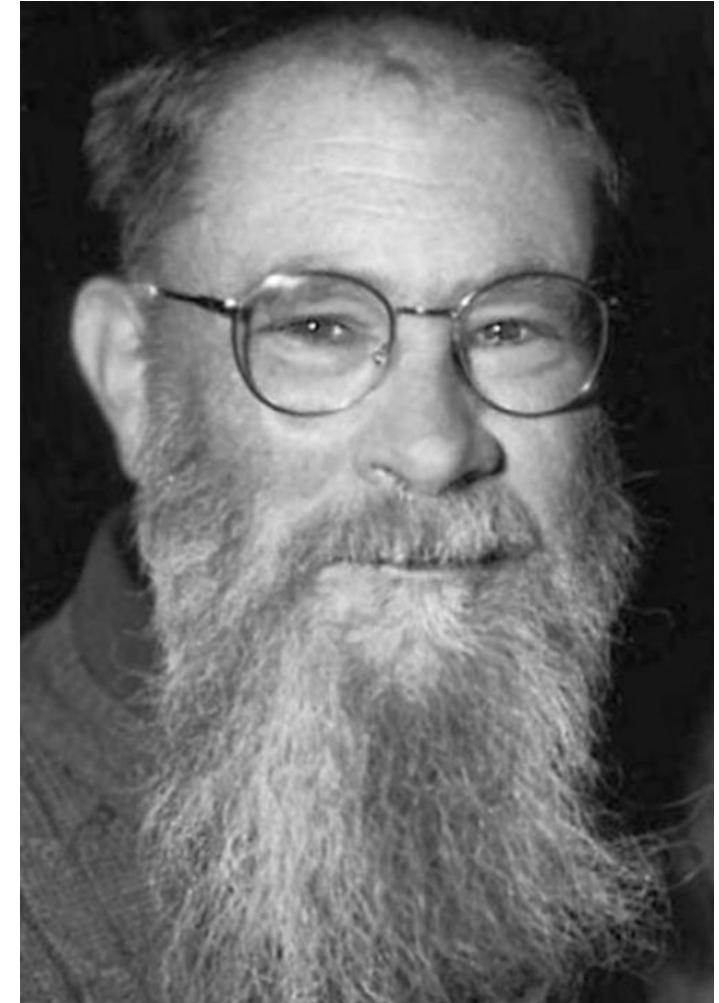


# *E-Language as Convention*

- The languages we speak are governed by conventional rules of grammar, style, and so on.
- We are habituated into the use of these rules early on
- But ultimately they are **conventions** like any other, e.g. the reason you don't run into people on a sidewalk
- More fundamentally, conventions are a species of **regularities**, or **patterns of behavior**

# *Lewis on Convention*

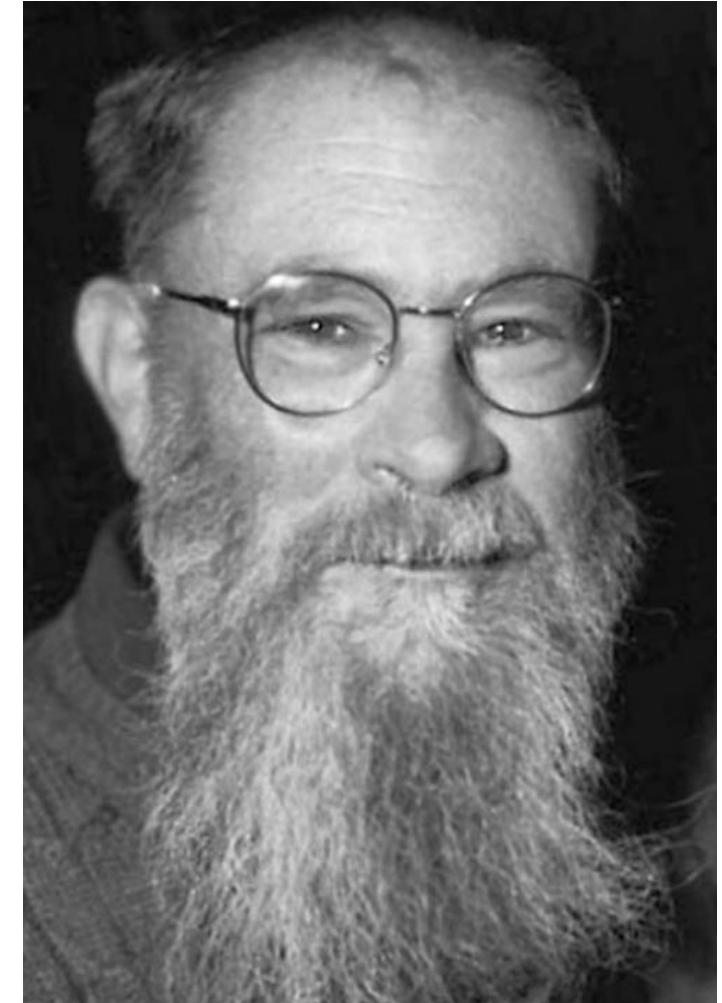
- A regularity R is a **convention** just in case:
  1. Everyone conforms to R
  2. Everyone believes others conform to R
  3. This belief gives everyone a good reason to conform to R himself
  4. Everyone believes others are doing the best they can to conform to R
  5. R is not the only possible regularity meeting (3) and (4)
  6. Each of the preceding factors are in principle common knowledge



# *Lewis on Convention*

“I swam” rather than “I swummed”

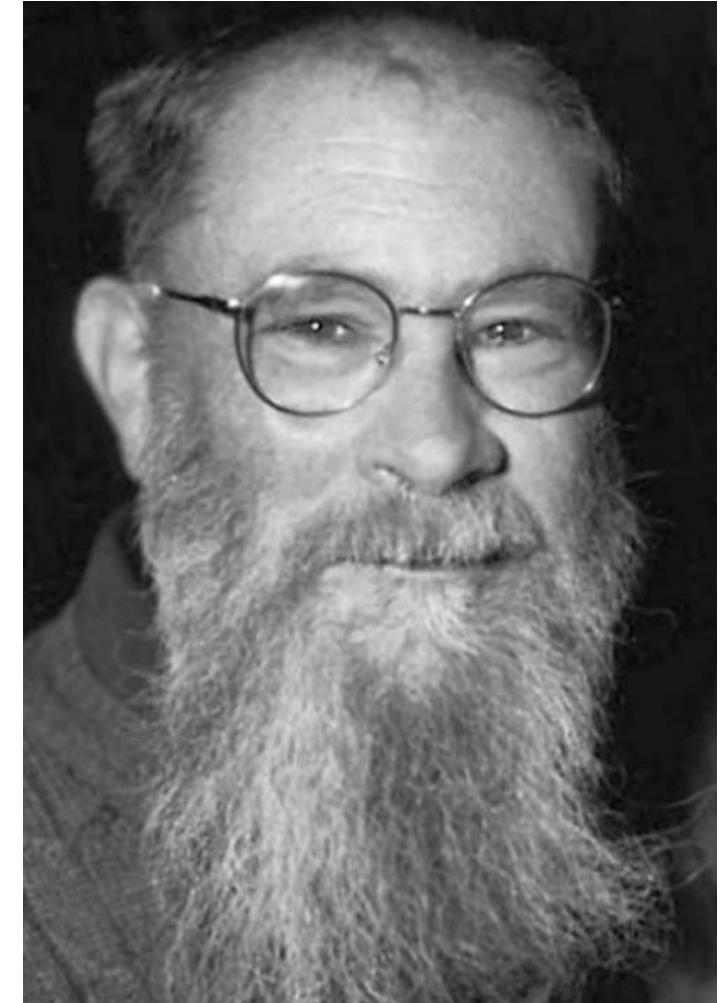
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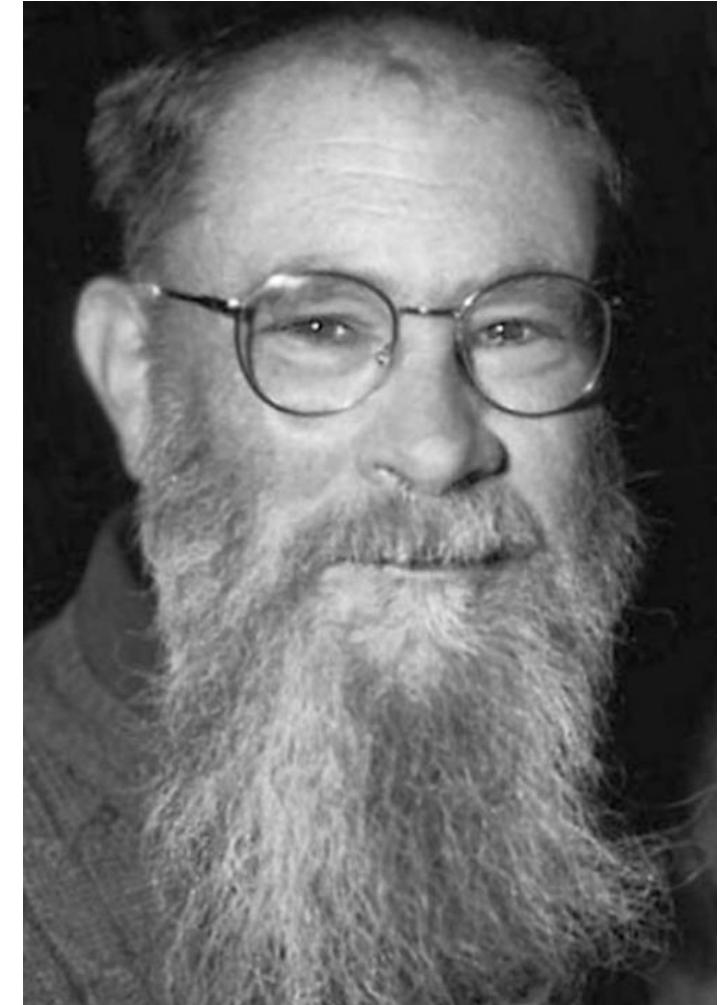
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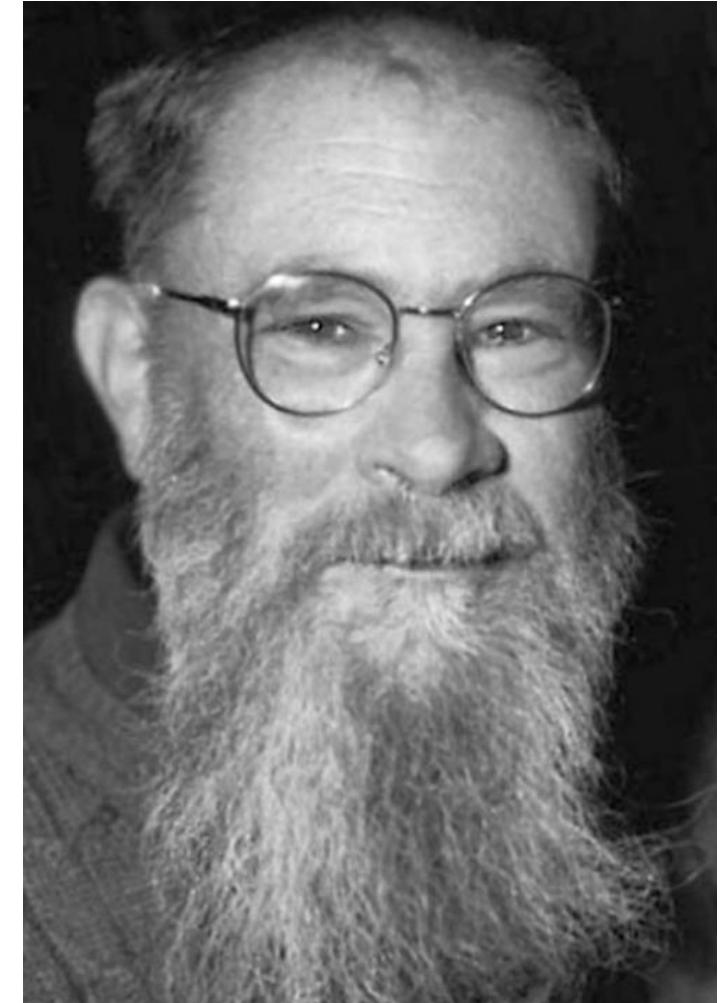
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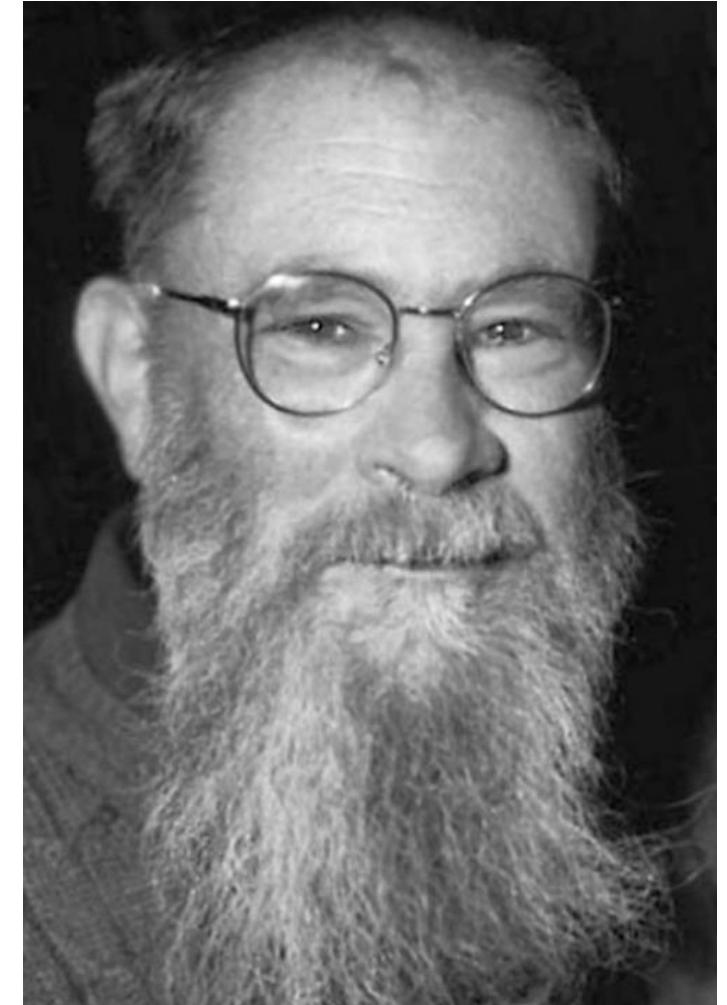
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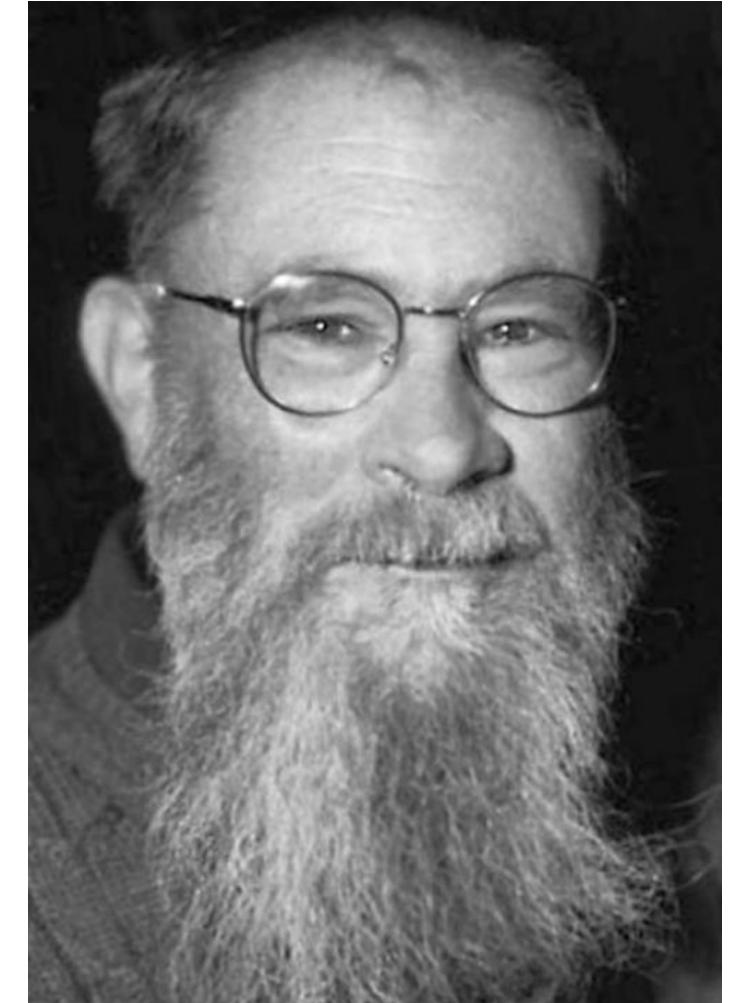
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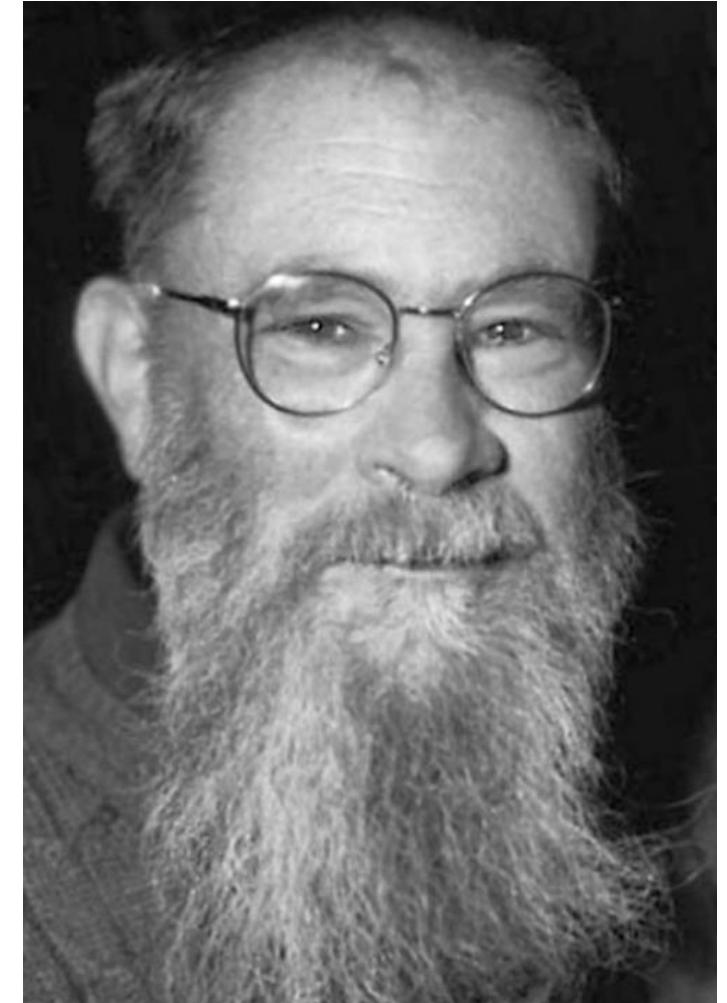
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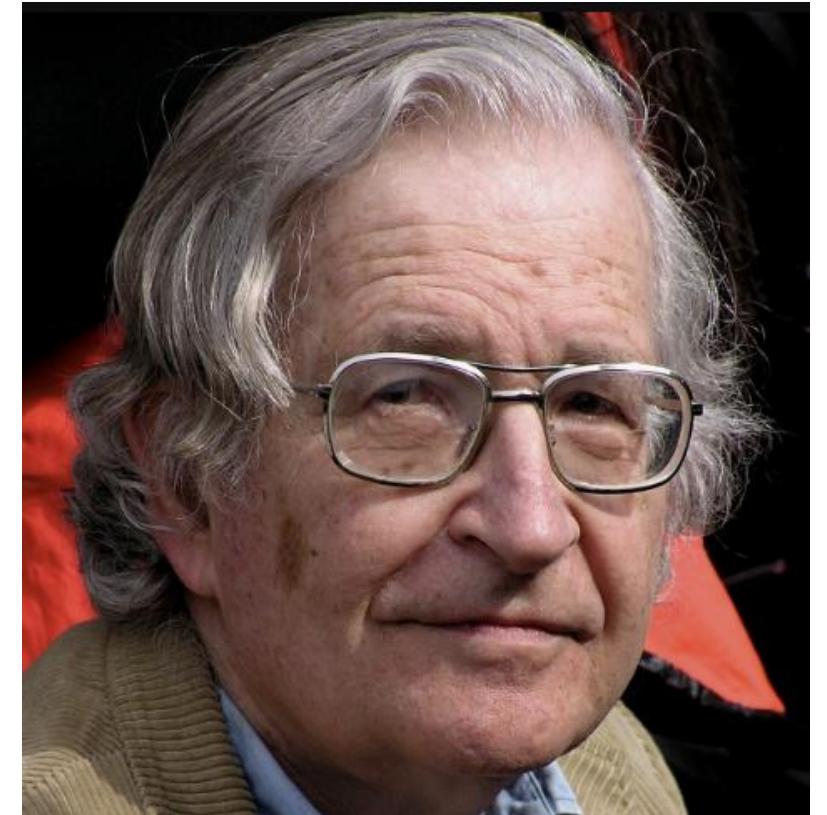
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# *Chomsky on I-Language*

- "Language" may also mean the internal, innate, unchanging foundation for linguistic competence, e.g. **I-Language**
- Chomsky claimed I-Language was the proper target of linguistics, as it reveals the computational system of the brain



# *Beverley on I-Logic*

- Linguistics competence consists of **dispositions** borne by an agent
- There must be an innate competence for **logical reasoning** since language depends on drawing distinctions
- The picture:<sup>\*</sup>
  - Foundational logic competence (I-Logic) grounds for
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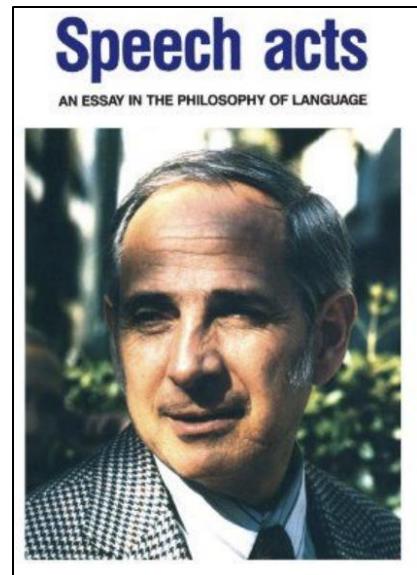
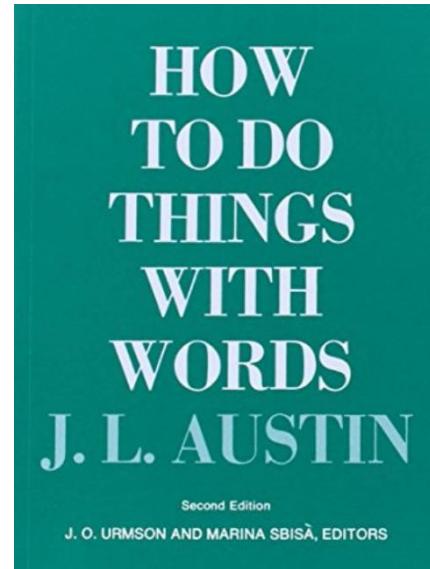
<sup>\*</sup> *Beverley, Trust Logic, Not Tortoises*

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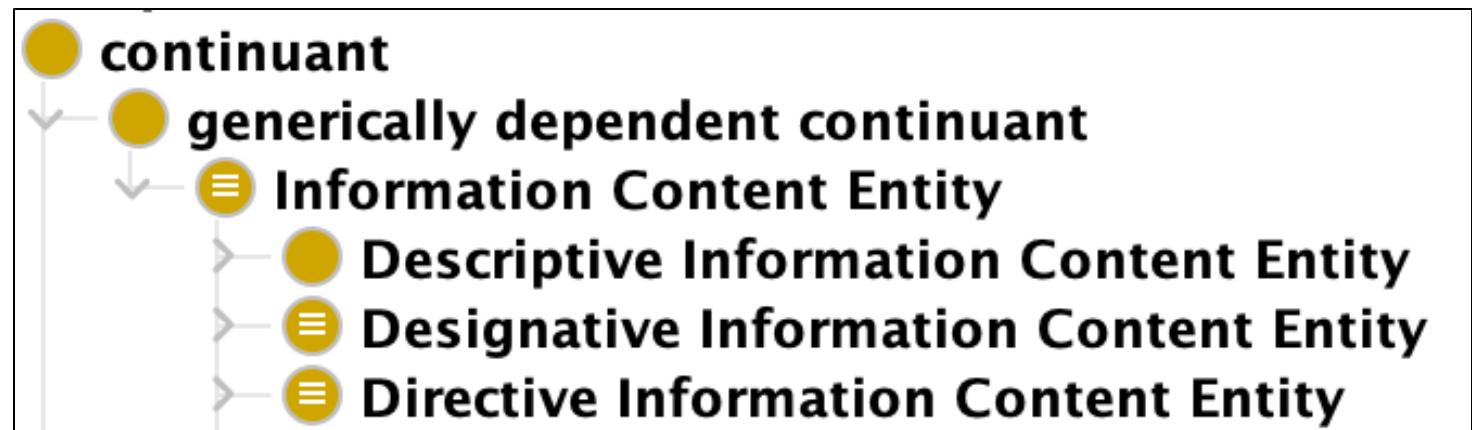
# *Speech Acts*

- While *speech* is any act of uttering, a *speech act* is an act in which an agent intends to convey meaning that is performed by the act
- Example categories of speech act include:
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  - Directive
  - Commissive
  - Expressive
  - Declaration



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# *Varieties of Fit for Speech Acts*

- Speech act types can be distinguished in terms of their direction of fit
  - **Word-to-World:** Make words fit the world, e.g. descriptive
  - **World-to-Word:** Make world fit the words, e.g. directive
  - **Creation-of-Fit:** Words change the world, e.g. designative



**Descriptive Information Content Entity**



**Designative Information Content Entity**



**Directive Information Content Entity**

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# ***Descriptive ICE***

- The class of information content entities that **describe** entities
- Such as a collection of demographic data, your biometric measurements, and so on
- Descriptive ICE can be evaluated for truth or falsity, e.g. “John is bald” is either true or false

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**Descriptive Information Content Entity**



**Designative Information Content Entity**



**Directive Information Content Entity**

# *Directive ICE*

- The class of information content entities that **prescribe** entities
- Such as blueprints for an automobile, directions for completing an assignment, algorithms, rules of grammar, and so on
- Directive ICE are **not** evaluable for truth or falsity, e.g. “Close the door” is neither true nor false

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**Descriptive Information Content Entity**



**Designative Information Content Entity**



**Directive Information Content Entity**

# *Designative ICE*

- The class of information content entities that **designate** entities
- Such as names, artifact identifiers, spatial region codes or identifier, and so on
- Designative ICE are often declared to be true, such as when one names a child or the coast of Madagascar; the designation may be appropriate or not

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# *Social World Ingredients*

- Performance of *speech acts* such as promising, asserting, excusing, etc. agents create:
  - Claims and Obligations
  - Authorities and Responsibilities
  - Memberships and Exclusions
- Which are ingredients in the ontology of the social world



# *Claims and Obligations*

- If Sam promises Sally to perform X, then Sam acquires an *obligation* to perform X
- Similarly, Sally acquires a *claim* on Sam that he perform X
- The claim and obligation are mutually dependent, i.e. mutually specifically dependent **roles**

# *Claims and Obligations in BFO*

- As with other *roles* in BFO, claims and obligations are underwritten by the *dispositions* of the parties involved
- Sam's obligation is grounded in:
  - *dispositions* inhering in Sally
  - Or *dispositions* inhering in the wider society
- To hold Sam accountable (e.g. punish, shame, shun, scold, etc.) if he fails to perform X as promised

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# *From Speech Acts to Document Acts*

- Documents can be:
  - Copied, modified, stored
  - Aggregated, e.g. appendices
  - Have component parts, e.g. plans have sub-plans
  - Executable, e.g. code
- Documents, combined with authority, make possible collective agency in corporations, universities, religions, governments, legal codes, armies, etc.



Standards About us News Taking part

Store



EN

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ICS > 35 > 35.060

# ISO/IEC 21838-2

## Information technology — Top-level ontologies (TLO) — Part 2: Basic Formal Ontology (BFO)

### GENERAL INFORMATION

Status : Under development      Publication date : 2020-03

Edition : 1

Technical Committee : ISO/IEC JTC 1/SC 32 Data management and interchange

ICS : 35.060 Languages used in information technology | 01.040.35  
Information technology (Vocabularies)

### MEMORANDUM FOR CHIEF DIGITAL AND ARTIFICIAL INTELLIGENCE OFFICER COUNCIL MEMBERS INTELLIGENCE COMMUNITY CHIEF DATA OFFICER COUNCIL MEMBERS

SUBJECT: Baseline Standards for Formal Ontology within the Department of Defense and the Intelligence Community

In April 2023, the Chief Digital and Artificial Intelligence Officer Council and the Intelligence Community Chief Data Officer Council chartered the joint Department of Defense (DoD) and Intelligence Community (IC) Ontology Working Group (DIOWG). It was tasked with developing coordinated ontologies to set the agreed definitions and standard necessary to make data machine understandable. Based on the DIOWG's recommendations, both Councils direct the use of three baselines: Top-Level Ontology, Basic Formal Ontology, and Common Core Ontology. These will set the baseline standards for formal DoD and IC ontology.

By aligning the DoD and IC ontologies to a common set of top and mid-level standards, the combined enterprise will realize significant gains in data interoperability, federated search and discovery, decreased analytic timelines, and better cost efficiency. This common approach to data ontology is key to deriving value from shared data assets at speed and scale. The DIOWG has provided additional background information on these international ontological standards in Attachment A.

The nation's warfighters and intelligence professionals will need to have a decisional advantage in the immediate future and that can only be unlocked through the sharing of interoperable data. The next steps for the DIOWG are to codify recommended principles and governance processes to manage the DoD-IC Ontology Foundry. The DIOWG collaboration site can be accessed by visiting <https://www.trmc.osd.mil/wiki/display/DIOWG/>.

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Lori Wade  
Intelligence Community Chief Data Officer  
Office of the Director of National  
Intelligence

Dr. Craig H. Martell  
Chief Digital and Artificial Intelligence  
Officer  
Department of Defense



National  
Intelligence  
Estimate

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for Weapons of Mass Destruction**

# D-Day Landings





## INGREDIENTS

- 2 x 400g beef fillets
- Olive oil, for frying
- 500g mixture of wild mushrooms, cleaned
- 1 thyme sprig, leaves only
- 500g puff pastry
- 8 slices of Parma ham
- 2 egg yolks, beaten with 1 tbsp water and a pinch of salt
- Sea salt and freshly ground black pepper

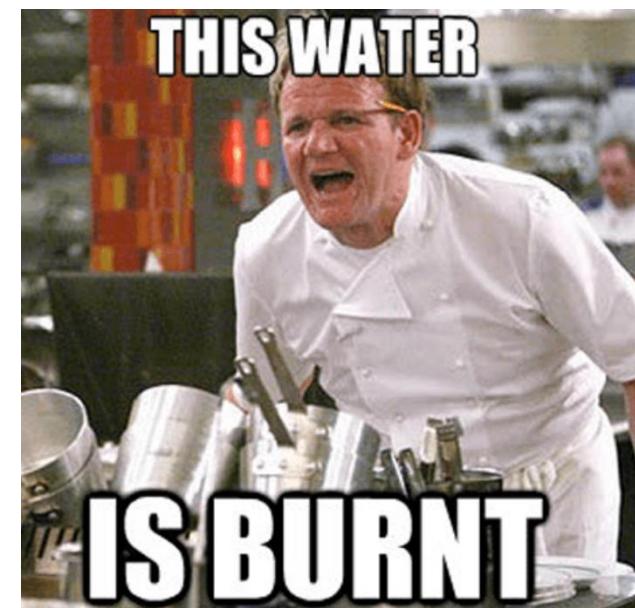
### For the red wine sauce

- 2 tbsp olive oil
- 200g beef trimmings (ask the

## METHOD

Serves 4

- 1 Wrap each piece of beef tightly in a triple layer of cling film to set its shape, then chill overnight.
- 2 Remove the cling film, then quickly sear the beef fillets in a hot pan with a little olive oil for 30-60 seconds until browned all over and rare in the middle. Remove from the pan and leave to cool.
- 3 Finely chop the mushrooms and fry in a hot pan with a little olive oil, the thyme leaves and some seasoning. When the mushrooms begin to release their juices, continue to cook over a high heat for about 10 minutes until all the excess moisture has evaporated and you are left with a mushroom paste (known as a duxelle). Remove the duxelle from the pan and leave to cool.
- 4 Cut the pastry in half, place on a lightly floured surface and roll each piece into a rectangle large enough to envelop one of the beef fillets. Chill in the refrigerator.
- 5 Lay a large sheet of cling film on a work surface and place 4 slices of Parma ham in the middle, overlapping them slightly, to create a square. Spread half the duxelle evenly over the ham.
- 6 Season the beef fillets, then place them on top of the mushroom-covered ham. Using the cling film, roll the Parma ham over the beef, then roll and tie the cling film to get a nice, evenly thick log. Repeat this step with the other beef fillet, then chill for at least 30 minutes.
- 7 Brush the pastry with the egg wash. Remove the cling film from the beef, then wrap the pastry around each ham-wrapped fillet. Trim the pastry and brush all over with the egg wash. Cover with cling film and chill for at least 30 minutes.



# *Digital Documentation*

- Documentation created a new dimension of **economic reality**:
  - Bank accounts
  - Mortgages
  - Stocks and Options
  - Cryptocurrency
  - Credit Cards
- Which are enduring social networks
- Debts and credits become information entities analogous to digital artifacts



**Fidelity**<sup>®</sup>



# *Digital Documentation*

- Documentation created a new dimension of **social reality**:
  - Online profiles
  - Digital galleries
  - Tweets
  - Live feeds
  - Online forums
- Which are also enduring social networks
  - Facebook
  - Instagram
  - Twitter
  - Reddit
- Online presences becomes information entities analogous to digital artifacts



# *Social Reality*

- Standardized and digital document play a crucial role in supporting and progressing the modern social world
- And much like a promise creates an obligation and a claim, so too documents create rights, obligations, responsibilities, etc.



# *Document Act Theory*

- Expanding speech act theory to **document act theory** has as its scope the social and institutional powers of documents, whether deontic, legal, etc.
- Like speech act theory, such a theory concerns how to *do things with* documents:
  - Represent the ways things are
  - Prescribe others to do things
  - Commit ourselves to doing things
  - Change the world

# *Varieties of Fit for Documents Acts*

- Document act types can be distinguished in terms of their direction of fit:
    - **World-to-Document:** Plan created so world fits the plan, e.g. blueprint
    - **Document-to-World:** Report describes plan execution, e.g. evaluation
    - **Standardization-of-Fit:** Authority publishes rule, e.g. legislation



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“Documents and document systems are the mechanisms for creating the institutional orders of Western capitalism.”

\* *de Soto, The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else*

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“It is a profoundly erroneous truism, repeated by all copy-books and by eminent people when they are making speeches, that we should cultivate the habit of thinking what we are doing. The precise opposite is the case.

**Civilization advances by extending the number of important operations which we can perform without thinking about them.”**

\* *Whitehead, An Introduction to Mathematics*

# *Varieties of Fit for Documents Acts*

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# *Standardized Documentation*

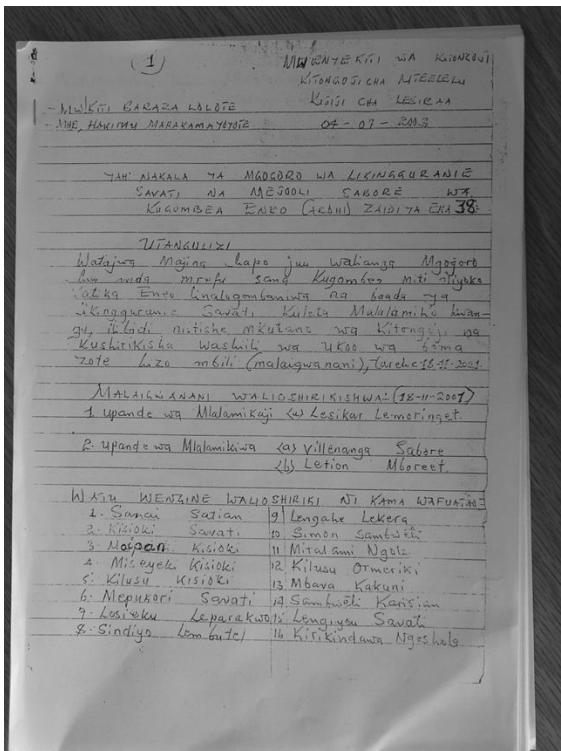
- Allow for standardized transactions, improved communication
- Allow assets to be described in standard, stable, categories
- Supports transition to robust registries

<b>W-9</b> Form W-9 (Rev. October 2018) Department of the Treasury Internal Revenue Service	<b>Request for Taxpayer Identification Number and Certification</b> ► Go to <a href="http://www.irs.gov/FormW9">www.irs.gov/FormW9</a> for instructions and the latest information.	Give Form to the requester. Do not send to the IRS.
1 Name (as shown on your income tax return). Name is required on this line; do not leave this line blank. John Beverley	2 Business name/disregarded entity name, if different from above	
3 Check appropriate box for federal tax classification of the person whose name is entered on line 1. Check only <b>one</b> of the following seven boxes. <input checked="" type="checkbox"/> Individual/sole proprietor or single-member LLC <input type="checkbox"/> C Corporation <input type="checkbox"/> S Corporation <input type="checkbox"/> Partnership <input type="checkbox"/> Trust/estate	4 Exemptions (codes apply only to certain entities, not individuals; see instructions on page 3):  Exempt payee code (if any)	

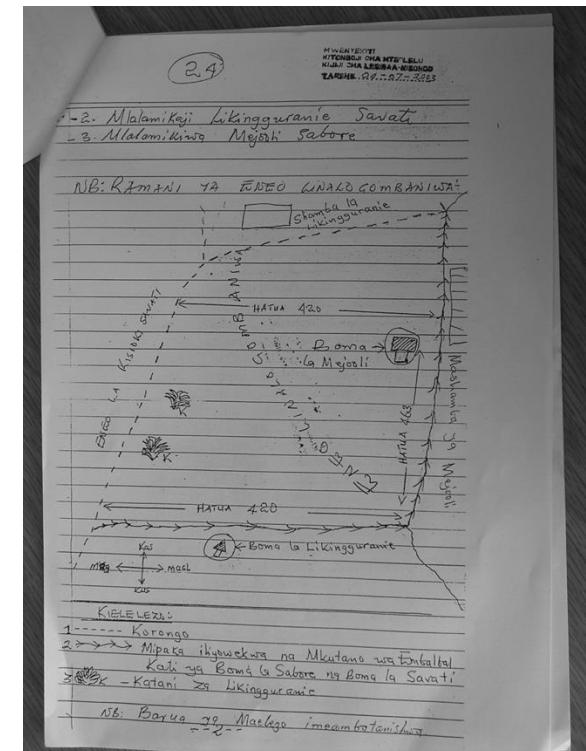
	<b>Employment Eligibility Verification</b> Department of Homeland Security U.S. Citizenship and Immigration Services	<b>USCIS</b> <b>Form I-9</b> OMB No. 1615-0047 Expires 10/31/2022				
<p>► START HERE: Read instructions carefully before completing this form. The instructions must be available, either in paper or electronically, during completion of this form. Employers are liable for errors in the completion of this form.</p> <p><b>ANTI-DISCRIMINATION NOTICE:</b> It is illegal to discriminate against work-authorized individuals. Employers <b>CANNOT</b> specify which document(s) an employee may present to establish employment authorization and identity. The refusal to hire or continue to employ an individual because the documentation presented has a future expiration date may also constitute illegal discrimination.</p> <p><b>Section 1. Employee Information and Attestation</b> (<i>Employees must complete and sign Section 1 of Form I-9 no later than the first day of employment, but not before accepting a job offer.</i>)</p> <table border="1" style="width: 100%;"><tr><td>Last Name (<i>Family Name</i>) Beverley</td><td>First Name (<i>Given Name</i>) John</td><td>Middle Initial C</td><td>Other Last Names Used (<i>if any</i>)</td></tr></table>			Last Name ( <i>Family Name</i> ) Beverley	First Name ( <i>Given Name</i> ) John	Middle Initial C	Other Last Names Used ( <i>if any</i> )
Last Name ( <i>Family Name</i> ) Beverley	First Name ( <i>Given Name</i> ) John	Middle Initial C	Other Last Names Used ( <i>if any</i> )			

# *Property Rights*

Property differs from a mere piece of land in that property is associated with documentation that creates and establishes rights which tie the owner to a physical asset



# Documentation of property dispute resolution over land in the Arusha area; established property rights



# Vital Records

COOK COUNTY CLERK VITAL RECORDS  
CHICAGO, ILLINOIS

CERTIFICATE OF LIVE BIRTH

DATE ISSUED 11/18/2021

STATE FILE NUMBER  
112-2021 0059024

CHILD'S NAME MIRA VIOLET BEVERLEY	DATE OF BIRTH JUNE 22, 2021		
SEX FEMALE	CITY OR TOWN EVANSTON	COUNTY OF BIRTH COOK	TIME OF BIRTH 11:59 AM
FACILITY NAME (If not institution, give street and number) EVANSTON HOSPITAL			
MOTHER/PARENT'S CURRENT LEGAL NAME: HOLLEN NICHOLE REISCHER	DATE OF BIRTH JULY 05, 1984		

Vital records offices oversees curation of  
and ways in which records may be  
subjected to amendment

These documents create and bind  
social and institutional reality

VERIFY PRESENCE OF WATERMARK  
NOTICE: WATERMARK IS AN ATTACHMENT TO VIEW

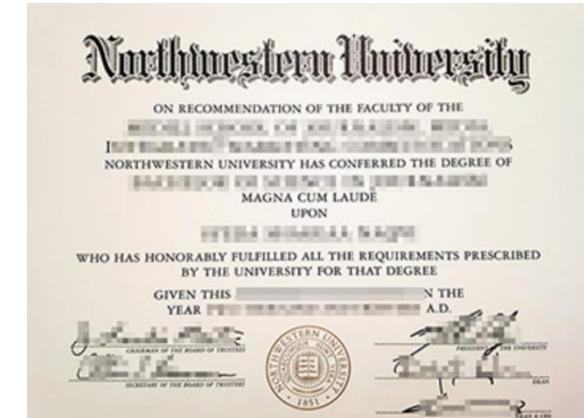
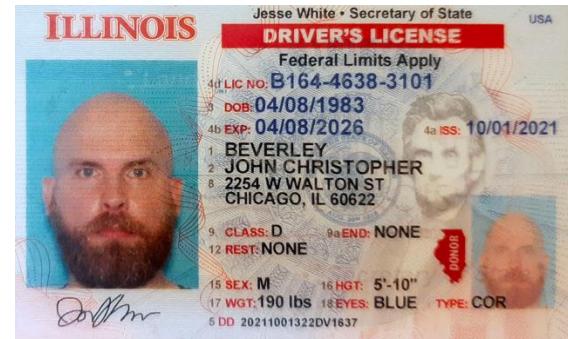
STATE OF GEORGIA  
AMENDED CERTIFICATE OF LIVE BIRTH  
(NOT VALID WITHOUT SECTION 2 ATTACHED)

1 State File Number 1983GA000024776

Local File Number	2 Child's Name First 3 Middle 4 Last 5 Jr/Jr JOHN CHRISTOPHER BEVERLEY	6 Sex MALE	7 Date Of Birth 04/08/1983	8 Time Of Birth 10:27 PM
9. This Birth (Single, Twin, Triplet, Etc.) SINGLE	10. If Not Single Specify Birth Order SINGLE DELIVERY	11. County Of Birth TOOMBS		
12. Hospital/Facility Name ONE MEADOWS PARKWAY	13. City, Town Or Location Of Birth VIDALIA			
14. Mother's Name First 15. Middle 16. Last JONI LYNN GREEN	17. Maiden (Last Name) BEVERLEY	18. Date Of Birth 10/20/1965	19. State Of Birth (if Not U.S.A Name Country) FLORIDA	
20. Residence State	21. County			

# *Credentials*

- *Credentials* are a type of standardized document which:
  - Serve as a status indicator
  - Are institutional objects
- Credentials enable rights-holders to exercise rights, assuming the holder is able to display the appropriate documentation



Registration Acknowledgment	
SELECTIVE SERVICE NUMBER 83-1855626-6	DATE OF BIRTH 04-08-1983
NAME AND CURRENT MAILING ADDRESS JOHN C BEVERLY 822 NEW FRANKLIN RD LOT 12 LAGRANGE, GA 30240	
(Fold on line.)	
SSS Form 3A (Feb-21)	
SOCIAL SECURITY NUMBER ON FILE	LAST ACTION DATE 09-24-2003
The Selective Service System thanks you for registering. This form is your official Registration Acknowledgment. Cut it out and safeguard it as your proof of having registered.	
ACTING DIRECTOR <i>[Signature]</i>	

# *BFO: Deontic Entities*

- An adequate account of **deontic entities** will require at a minimum ontological characterizations of:
  - Social dispositions, e.g. customs, languages, rituals, institutions, etc.
  - Speech acts, e.g. imperatives, interrogatives, etc. (see ARGO)
  - Mental functioning, e.g. beliefs, knowledge, hopes, etc. (see MFO)
  - Social acts, e.g. promising, praising, blaming, etc.
  - Documents, e.g. credentials, authorized reports, etc. (see D-Acts)
  - Authorities, e.g. governments, institutions, etc. (see CCO)

*green* indicates developed work; *blue* indicates first steps; *red* indicates gap

# *Outline*

- Real Patterns
- From Language to Speech Acts
- From Speech Acts to Document Acts
- Design Pattern Exercise

# *Design Patterns: Practice*

*John Beverley*

Assistant Professor, *University at Buffalo*  
Co-Director, National Center for Ontological Research  
Affiliate Faculty, *Institute of Artificial Intelligence and Data Science*

# *Aboutness*

- **Information** is a pattern that is **about** something
- In BFO extensions - such as the Information Artifact Ontology and the Information Entity Ontology - information is represented by the class **Information Content Entity**
- Where the “is about” relation is understood to be primitive:

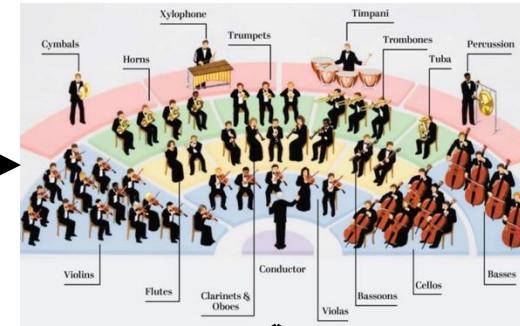
**definition** [language: en]

A primitive relationship between an Information Content Entity and some Entity.

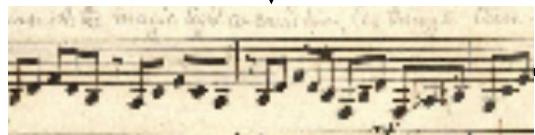
# *Beethoven's #9<sup>th</sup> Symphony*

**Beethoven's #9**

*is about*



*concretized in*



*inheres in*



*generically depends on*

*concretized in*



*has realization*



# *Competency Question*

Towards a Cyber Information Ontology

David LIMBAUGH<sup>a</sup>, Mark JENSEN<sup>a,b</sup>, and John BEVERLEY<sup>a,c,1</sup>

<sup>a</sup>*National Center for Ontological Research*

<sup>b</sup>*Customs and Border Protection*

<sup>c</sup>*Institute for Artificial Intelligence and Data Science*

**Abstract.** This paper introduces a set of terms that are intended to act as an interface between cyber ontologies (like a file system ontology or a data fusion ontology) and top- and mid-level ontologies, specifically Basic Formal Ontology and the Common Core Ontologies. These terms center on what makes cyberinformation management unique: numerous acts of copying items of information, the aggregates of copies that result from those acts, and the faithful members of those aggregates that represent all other members.

**Keywords.** ontology, information, cyber information, Basic Formal Ontology, Common Core Ontologies

**What entities are involved in the spread of information from one information bearer to another?**

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**What entities are involved in the spread of information from one information bearer to another?**

**SELECT AND MODEL ONE OF THE FOLLOWING**

An email is sent from a laptop to a personal computer.

Information stored on a solid-state drive is displayed on a monitor.

A file system snapshot is stored on a backup drive.

# *Competency Question*

**What entities are involved in the spread of information from multi-modal information bearers to a target?**

Towards a Cyber Information Ontology

David LIMBAUGH<sup>a</sup>, Mark JENSEN<sup>a,b</sup>, and John BEVERLEY<sup>a,c,1</sup>

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**What entities are involved in the spread of information from multi-modal information bearers to a target?**

## **SELECT AND MODEL ONE OF THE FOLLOWING**

Acoustic and image traffic data are sent from field sensors to a controller which adjusts the timing of traffic light changes.

Bathymetric, meteorological, and temperature data are sent to a dataset for tracking marine life.

# *Competency Question*

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**What relationship exists among information bearers participating in the spread of information from a source?**

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**What relationship exists among information bearers participating in the spread of information from a source?**

**SELECT AND MODEL ONE OF THE FOLLOWING**

Relationships among 10 machines that receive an email from a single machine.

Relationships among distinct drives storing identical snapshots of a system.

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**What entities are involved in spreading information according to standard transmission protocols?**

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**What entities are involved in spreading information according to standard transmission protocols?**

**SELECT AND MODEL ONE OF THE FOLLOWING**

A password is submitted over an encrypted Secure Socket Layer connection.

A password is submitted over an unencrypted HTTP connection.

# *Competency Question*

**What relationships exist among information entities under version control which correspond to a single, current, version?**

Towards a Cyber Information Ontology

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**SELECT AND MODEL ONE OF THE FOLLOWING**

Two authors collaborating on a paper using Google Docs.

A developer accessing code on a GitHub repository, from distinct machines.

# BFO: Basic Formal Ontology

J. Neil Otte<sup>1</sup>, John Beverley<sup>2</sup>, and Alan Ruttenberg<sup>3</sup>

<sup>1</sup>Johns Hopkins University Applied Physics Laboratory

<sup>2</sup>Northwestern University

<sup>3</sup>University at Buffalo

**CASE 6: *A marriage is a contract that is regulated by civil and social constraints. These constraints can change but the meaning of marriage continues over time.***

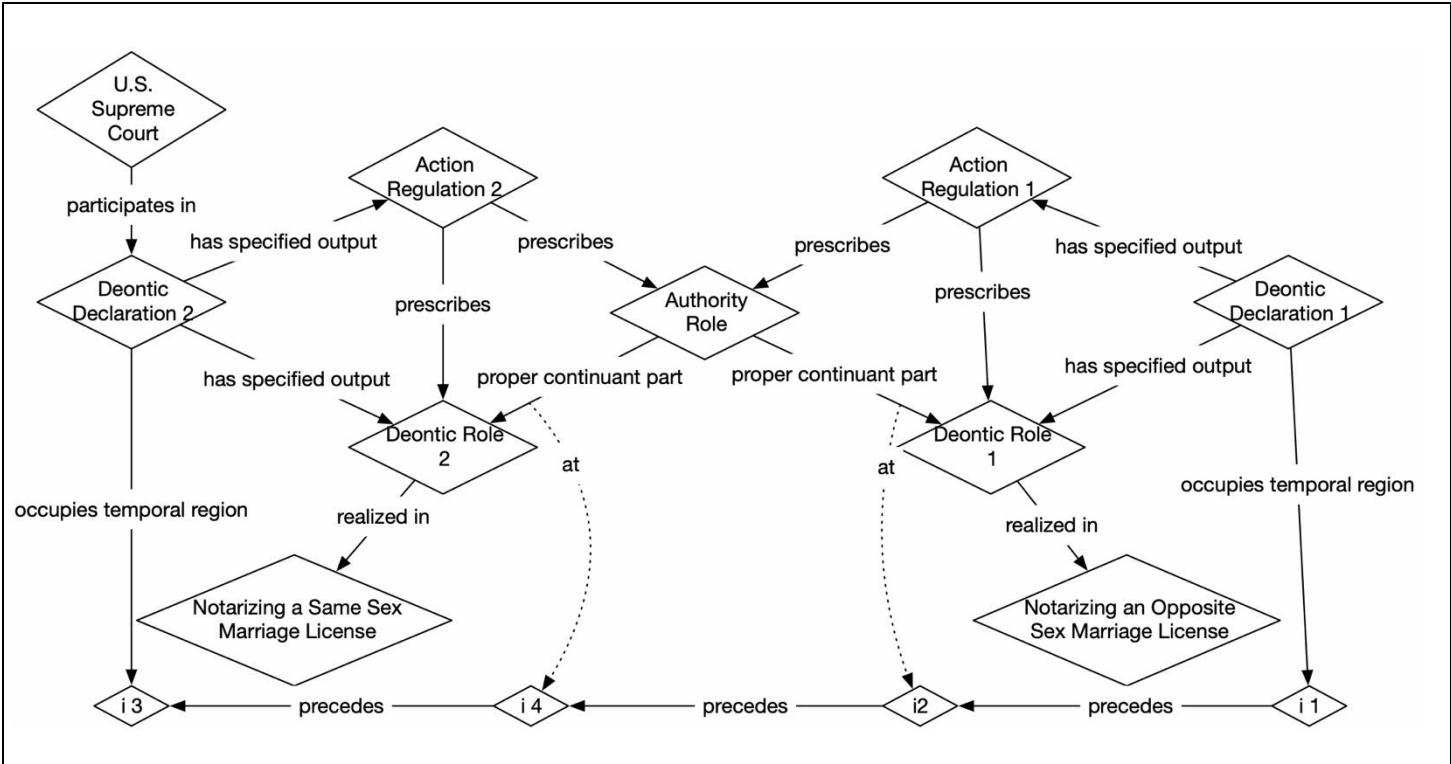
# *Marriage License*

- In the U.S., states impose *eligibility requirements on individuals*, e.g. individuals entering marriage must be able to consent and above a certain age.
- States also impose *eligibility requirements on the couple*, e.g. one member of the union must be a U.S. citizen

# *Marriage License*

- Before 1967, several states prohibited interracial marriage; until 2015 several prohibited same-sex marriage.
- Governments grant *obligations to spouses* - married partners bear financial responsibilities to one another - and *privileges* - married partners are not required to testify against one another in court.

**CASE 6: A marriage is a contract that is regulated by civil and social constraints. These constraints can change but the meaning of marriage continues over time.**



Class	Definition or Elucidation
document	a collection of information content entities intended to be understood together as a whole
government	an organization that exercises executive, legislative, or judicial authority over a region
marriage license	a document issued by a government, which legally binds agents as spouses, and invests them with associated <b>instances of deontic role</b>
deontic declaration	a social act that creates or <b>revokes</b> a deontic role
social act	a planned process that is carried out by a person or an organization, and is self-generated, directed towards another person or an aggregate of persons, an organization or an aggregate of organizations, and that needs to be perceived
deontic role	a role that <b>inheres</b> in a person and that is externally grounded in the normative expectations that other persons within a social context have concerning how that person should behave
action regulation	an information content entity that <b>prescribes</b> an act as required, prohibited, or permitted, and is the <b>output of</b> an act that <b>realizes</b> some authority role
authority role	a role that is <b>realized</b> by actions that create, modify, transfer, or eliminate action regulations or other authority roles, and <b>inheres</b> in an agent in virtue of collective acceptance of that agent's ability to issue binding directives

# *Readings*

- Aboutness: Towards Foundations for the Information Artifact Ontology
- Document Acts
- On Credentials
- Ontology of Information Artifacts in the Intelligence Domain