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Implication Space Semantics and Legal Methodology

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From insight to impact.

Instruments of legal practice

- Propositions as the central instruments
- A network of norms – norms all the way down
- Pragmatic Positivism
- *"A norm is valid and authoritative for the legal discourse if it is considered valid and authoritative in the social practice of applying the law(i.e., by persons applying the law). A social practice of applying the law is all the more rational the more implicit reasons and conditions of the explicitly respected and applied norms can be made explicit without incurring contradictions or ambiguities."*
- No particular focus on interpretation methodology



Introduction

- Goal: develop a more robust methodology for legal interpretation
- Relevant both for statutory interpretation and common law
- Inspired by philosophy of language and NLP progress
- Law as a semantic and pragmatic discipline
- Central question: how do legal norms connect with facts?

Legal argumentation

- Lawyers apply norms to fact patterns – statutory norms but also precedents
- Example: Swiss Code of Obligations Art. 58 OR

“The owner of a building or other structure shall compensate for any damage caused by faulty construction or manufacture or inadequate maintenance.”

- Interpretation involves multiple premises and conclusions
- Disputes often concern material inferences, not just formal logic

Legal argumentation

- Classical logic assumes:
    - Monotonicity (adding premises cannot invalidate conclusions)
    - Single-conclusion structures
- Legal reasoning:
    - Non-monotonic (new premises can invalidate conclusions)
    - Requires handling multiple premises & conclusions
- Solution: Implication Space Semantics

Implication Space Semantics

- Meaning = role in a network of implications & incompatibilities
- “Good implications”: premises genuinely imply conclusions
- Subjunctive robustness: how implications hold under changes to the premise space (difference to coherence?)
- Handles non-monotonicity in law

Implication Space Semantics

- P1 = statutory norm: The owner of a building or other structure shall compensate for any damage caused by faulty construction or manufacture or inadequate maintenance.
- This does not rule out the following conclusions
- C1: The owner of a paper airplane is liable for injuries caused by a paper airplane.

Now add:

- P2: The term “other structure” in P1 refers only to objects firmly connected to the ground.
- Under P1 and P2, C1 is no longer a valid conclusion.

Implication Space Semantics

Similarly, adding conclusions can also change validity the validity of the premises. Assume:

- P1: The owner of a building or other structure shall compensate for any damage caused by faulty construction or manufacture or inadequate maintenance.
- P2: The term “other structure” in P1 refers only to objects firmly connected to the ground.
- And:
- C2: The owner of a football stadium is liable for injuries caused by wet and slip-pery steps.
- If C1 is added alongside C2, the conclusion becomes invalid, as C1 is not implied by P1 and P2.
- C1: The owner of a paper airplane is liable for injuries caused by a paper airplane.
- A court would need (i) either to change P1 and/or P2 or not accept C1.

Does adding more premises & conclusions increase robustness?

- P1: The Freedom of Religion (e.g. a constitutional provision) requires the state to remain neutral.
- P2: State neutrality means that the state must maintain an equally open attitude toward different worldviews and creeds.
- P3: State neutrality means that public schools can be attended without impairing religious freedom.
- P4: State neutrality means that the state does not take sides in favor of a particular religion.
- C1: Crucifixes are prohibited in public school classrooms.
- C2: Teachers are not allowed to wear headscarves in class.
- C3: Pupils must not be prohibited from wearing headscarves

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- P5: State neutrality means a strict separation of state and religion (i.e., following a laicist/secular approach).
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Does adding more premises & conclusions increase robustness?

- Adding more premises & conclusions increases robustness
- Mirrors traditional methods:
    - Grammatical (semantics)
    - Teleological (purpose)
    - Systematic (context in legal system)
    - Historical (legislative intent, past meanings)

What should be the priority – adding premises or adding conclusions?

- Let us assume Court X has the task of applying the freedom of religion provision for the first time
- Two possible priorities:
- Courts could think about developing premises for the application of the norm (see P1-P5) – e.g. through semantics or traditional legal methodology
- Courts could think about developing conclusions for the application of the norm (see C1-C3) – e.g. which facts should be covered by a provision?
- Has our discipline been wrong in teaching students how to understand a "norm" or a "precedent"? Shouldn't they learn to understand whole implication spaces of premises and conclusions