

ing to logical statements.

- There is a precise notion of logical consequence, which determines whether a statement follows semantically from a set of other statements (premises). In fact, the primary original motivation of logic was the study of objective laws of logical consequence.
- There exist proof systems that can automatically derive statements syntactically from a set of premises.
- There exist proof systems for which semantic logical consequence coincides with syntactic derivation within the proof system. Proof systems should be sound (all derived statements follow semantically from the premises) and complete (all logical consequences of the premises can be derived in the proof system).
- Predicate logic is unique in the sense that sound and complete proof systems do exist. More expressive logics (higher-order logics) do not have such proof systems.
- Because of the existence of proof systems, it is possible to trace the proof that leads to a logical consequence. In this sense, the logic can provide explanations for answers.

The languages of RDF and OWL2 profiles (other than OWL2 Full) can be viewed as specializations of predicate logic.

One justification for the existence of such specialized languages is that they provide a syntax that fits well with the intended use (in our case, web languages based on tags). The other major justification is that they define reasonable subsets of logic. As already mentioned, there is a trade-off between the expressive power and the computational complexity of certain logics: the more expressive the language, the less efficient the corresponding proof systems. As we stated, most OWL variants correspond to a description logic, a subset of predicate logic for which efficient proof systems exist.