

# A Taxonomy of Questions With Respect to the Universal-Particular Dichotomy

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## 1. Introduction

The Question Ontology Project aims at providing a philosophical analysis and categorization of questions. The categorization is based on criteria such as linguistic patterns, semantic representations, formal structures of questions, and so on. On this basis, we have devised ten taxonomies of questions. We aim at building a model such that each question (except rhetorical and ironic ones) could be located in one of those taxonomies. We also aim at formalizing complexity values for each question, which would reflect the difficulty to answer a question. By constructing taxonomies and calculating complexity values of questions, this project aims at supporting scientific research: When the complexity value of their research question exceeds a manageable point, scientists can, for instance, change their question into a more manageable one.

This paper presents one of those ten taxonomies named the Universal-Particular classification. The universal-particular dichotomy is a crucial aspect not only for philosophy, but also for ontologies [1]. It is not exclusive from our other taxonomies, and a question may be classified in one of the other taxonomies and still find a place in this classification. To take a concrete example, an inquiry into Sherlock Holmes can be classified in a taxonomy of question types, and still be placed in the Universal-Particular Taxonomy as its feature a fictional character.

## 2. Methodology

One of the central distinctions in ontology is universal and particular. Universals can be instantiated whereas particulars are instances (and thus cannot be instantiated) that have spatiotemporal locations [1]. Moreover, universals should be distinguished from classes, which are specific groups of particulars. The rationale for this classification is that the complexity of questions about class of entities has to be different from the complexity of questions about particulars, and universals cannot be identified with classes.

Our team of the Question Ontology project has constructed this taxonomy by classifying lists of questions from various fields. This taxonomy encompass three main branches: (1) universals, (2) classes, and (3) particulars, as well as sub-branches for each of those branches. We devised this tree with exhaustivity in mind: every question we considered should be located at some place in the taxonomy.

## 3. Results

Questions about universals (1) include only general terms that can be instantiated in a respective particular. These questions do not have spatiotemporal aspects most of the time (e.g., “What is time?” / “How do you define ‘abstract’?”)

Questions under classes (2) include words that refer to a number of particulars with common properties or characteristics. This branch has two sub-branches. A question that includes merely one class is called ‘single class’ (2.1) (e.g., “What is the population of penguins?”), and a question that includes more than one class related by a relation of intersection, unification, or completion is called ‘multi-type class’ (2.2) (e.g., “What is the ratio of the population of emperor penguins to that of the penguins?”).

Questions about particulars (3) include names of entities that may have spatiotemporal features. These questions can be about the particulars either in the singular or plural form. This branch has sub-branches, as well. The questions under ‘etnonym’ (3.1) ask information about folks or population (e.g., “Who are the Maya?”). The questions under ‘toponym’ (3.2) make inquiries into geographical names (e.g., “What is a plateau?”). The ‘cosmonym’ (3.3) questions, on the other hand, require information about celestial bodies (e.g., “Do we observe the same face of Morning Star and Evening Star?”). The questions under ‘ktematonym’ (3.4) make inquiry into institutes (e.g., “What are the benefits of kindergartens for working mothers?”). When information about pennames, titles, or pseudonym is searched, these questions fall under ‘nick names’ (3.5) (e.g., “When was Mark Twain born?”). The questions under ‘fictional names’ (3.6), however, ask information about characters of cartoons, movies, series, and so on (e.g., “If there is a fight among heroes, who wins: Superman or Batman?”). There might be some questions regarding bodiless entities, which are under the sub-branch ‘incorporeal names’ (3.7) (e.g., “Is it possible to communicate with angels?”). Next, the questions that ask information about human made objects are under ‘names of artifacts’ (3.8) (e.g., “Could you tell us about Apollo 13?”). Lastly, the questions under ‘names of living beings’ (3.9) inquire information about humans, animals, or plants (e.g., “Who is the director of *Scent of a Woman*?” or “How is Bobi?”, Bobi is the name given to a cat).

To conclude, due to its inclusive aspect and significance in ontological discussions, the universal-particular classification is one of the essential parts of the Question Ontology Project. Further work will ensure the completeness of this taxonomy and establish specific weights for each node in the taxonomy, in order to quantify the complexity of questions.

## References

- [1] Arp, Robert, Barry Smith, and Andrew D. Spear, *Building Ontologies with Basic Formal Ontology*, the MIT Press, Cambridge-Massachusetts, 2015.
- [2] Hiz, H., *Questions*, Reidel Publishing Company, Dordrecht: Holland/ Boston: USA, 1978.
- [3] Sloman, Aaron, ‘Towards an ontology for factual questions’, Unpublished manuscript, University of Birmingham, UK, URL=<http://www.cs.bham.ac.uk/research/projects/cogaff/misc/question-ontology.pdf>.