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TITLE: Inheritance Reasoning from an Ecological Perspective

ABSTRACT: In this talk, I present results from a simulation-based study of inheritance inference. The study aims to ascertain which kinds of inheritance inferences are reliable, with attention to variations in reliability that are contingent upon the type of environment in which inferences are made. For example, the study addresses whether inheritance inference is reliable in the case of 'exceptional subclasses', and attends to variations in reliability that result from variations in the entropy level of the environment. A further goal of the study is to show that the reliability of inheritance inference depends crucially upon the criteria that are used in selecting the classes that serve as the basis for inheritance inference. One approach to inheritance inference proceeds by treating any atomic property as determining an admissible class. A second approach identifies classes with the cells of a partition (of size k) of the domain of objects that maximizes the similarity of objects that are assigned to the same class. In addition to permitting more inferences, our study shows that the second approach results in inferences that are far more reliable. The difference in the performance of the two approaches is particularly great in the case of exceptional subclasses.