Ontologies

Ontologies are specialized vocabularies intended to describe a domain of knowledge in a machine actionable format. At a very basic level, an ontology acts as a set of shared standard definitions, which helps ensure that those using it are all on the same page.

Basic Structure

There are many definitions of what exactly constitutes an ontology, and they do not always agree. But in a basic sense, ontologies generally include three basic ideas. First, they list basic concepts (aka "*classes*"). Second, they describe these classes via standardized descriptive items or *attributes*. Third, ontologies describe *relationships* between concepts, such as "parent" and "child".

Why should I use an ontology?

Ontologies add value to your research data and can make analysis both easier and more transparent. Because concept relationships are built into an ontology, when you use concept terms to describe observations in your research you can then easily see how various observations may relate to, or differ from, each other without the need for manual coding. These types of analyses are also more transparent to other researchers, as you are using a standard set of definitions.

Ontologies also make data from separate research efforts more interoperable. If two data sets utilize the same ontology, they can be more easily combined. And even if they do not use the *same* ontology, it is always easier to transform structured data from one format to another, so utilizing an ontology greatly reduces the burden of restructuring data for combination with other datasets.

How do I find the right ontology?

Finding the correct ontology for your purposes is an important first step. You can use an ontology browser such as the Bioportal or Ontobee to explore existing ontologies others have created. It's important to examine not just the domain represented by the ontology but also the purpose for which it was created (which will affect which classes, attributes, and relationships are included), and ensure that both align with your research goals.

How can I use an ontology in my research?

You can always utilize an ontology on your own, but REDCap allows you to assign ontologies to specific fields which can make the process even easier. By choosing an ontology for your field in REDCap, the concept terms from that ontology will be "pre-loaded" into the field for you and you can type to select the term you want. REDCap will also validate that any value entered into the field is a valid ontology term. arcus-support@email.chop.edu

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