The National Academies of
SCIENCES • ENGINEERING • MEDICINE

ACCELERATING BEHAVIORAL SCIENCE THROUGH ONTOLOGY DEVELOPMENT AND USE
Board on Behavioral, Cognitive, and Sensory Sciences
Division of Behavioral and Social Sciences and Education

WHAT ARE ONTOLOGIES AND HOW ARE THEY USED IN SCIENCE?

Committee Workshop #1
May 24, 2021
1-5 pm

Session I Intellectual Context: Scientific Ontologies and How They Function *1:00 -3:00*

An Ontology of Ontologies—Overview of the Landscape

A conceptual overview of the objectives for developing scientific ontologies and the uses to which they are put, drawing on examples from the behavioral sciences. Dr. Danks will stitch together key conceptual ideas and challenges/assumptions into a common framework.

David Danks, Carnegie Mellon University

A Close Look at Conceptual Structure

Using the example of the Cognitive Atlas, Dr. Poldrack will examine the rationale for developing an ontology and the development process, and scientific challenges the developers hoped to solve, particularly those related to the use of natural language to describe concepts in cognitive science.

Russell Poldrack, Stanford University

A Practical Look at the Spectrum of Ontologies

Drawing on experience from across domains in academia as well as commercial applications, Dr. McGuinness will discuss approaches to building ontologies that are inclusive and acceptable to diverse users. She will identify foundational ideas from the field that support current efforts to develop and adapt ontologies.

Deborah McGuinness, Rensselaer Polytechnic Institute

Committee questions and discussion

Break

Session II Two Use Cases *3:15 – 5*

Experts on two example ontologies will discuss lessons learned, considering questions such as:

- Why was this ontology needed—what were the problems people hoped it could resolve?
- How was it developed: who was involved, how were key decisions made/authorized/ratified?
- How is it used? Was it easily accepted? Did unanticipated challenges emerge once people started using it?
- What have been its effects on researchers, possibilities for collaboration, and interdisciplinary work?
- What do you anticipate for its future? Is there a process in place for adapting it to new discoveries or other changes in the field?

Ontology for mental health research and practice: RDoC and the shortcomings of the DSM

Tom Insel, Consulting Professor, Stanford
Bruce Cuthbert, National Institute of Mental Health
Uma Vaidyanathan, National Institute of Mental Health

An Ontology of Psychological Problems Across the Life Span: Structure of Causes and Change

Ben Lahey, University of Chicago

Committee questions and discussion

Adjourn 5:00