



a collaboratively developed
cognitive science ontology

www.cognitiveatlas.org

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Overview

The Cognitive Atlas aims to capture knowledge from users with expertise in psychology, cognitive science, and neuroscience. The primary project objectives are to build a collaborative resource for developing a shared consensus on terminology definitions and to allow the community to collaboratively map conceptual relationships between terms in the database.

There are two basic kinds of knowledge in the knowledge base. **Definitions** provide a basic description of individual concepts, tasks, and indicators. **Assertions** describe relations between different concepts, tasks, indicators, and publications.

A quick example

A Cognitive Atlas contributor has **defined** the concept **abstract knowledge** as *knowledge that is general and is not tied to a specific instance*.

Another contributor has **defined** the concept **mental representation** as *a symbolic mental structure that bears an isomorphic relation with some entity or concept in the world*.

Based on these definitions, a contributor has confidently **asserted** that **abstract knowledge is a kind of mental representation**.

A fundamental feature of the system is the ability to capture not just agreement but also disagreement regarding definitions and assertions. Thus, if you see a definition or assertion that you disagree with, then you can assert and describe your disagreement.

The system also supports integration with external resources. Published research citations from PubMed can be attached to elements in the knowledge base, and heatmaps from the PubBrain system are presented alongside many definitions.

Current project status

The Cognitive Atlas is up and running at www.cognitiveatlas.org . The system has core functionality complete and is currently in the process of being populated with the baseline set of terminology definitions.

The system already contains over a hundred definitions for nearly eight hundred common terms in cognitive science. A small set of assertions has also been added, primarily as part of the system design and development process as we work out the exact functionality of the system.

Please be aware that this is a **beta release** of the system. As of this writing in late 2009, the system is up and running but needs additional work in two specific areas:

- Population of the system, first with definitions of our terms and then later on with assertions
- Building in support for users to contribute more complex assertions

We are targeting **March 1, 2010** for completing the processes of adding definitions and adding support for more sophisticated assertions. Until that time, you may wish to focus primarily on contributing definitions to the system, as the assertion making portion of the application is under active development and is subject to change.

Again, this is a beta system under active development! You will see major updates pushed to the system at the beginning of each month as we push updates onto the project's server. There are still bugs to be found, so please [notify us](#) if you run into any unexpected behaviors or errors.

Getting started

Any web user can browse the knowledge base. We would encourage you to read through this document while clicking around on the site.

To contribute, you'll need an account. If you don't already have a contributor account on the system, [sign up here](#).

Once approved you'll be able to add your contributions to the system. We suggest starting with definitions, as the system's support for definitions is well established at this point and is a high priority for the project.

Definitions

Definitions are the basic building block of knowledge in the Cognitive Atlas. We've selected a base set of around eight hundred terms for the initial launch of the system.

Terms are classified as either **concepts** or **tasks**. Examples of **concepts** include **memory acquisition** and **selective attention** while example **tasks** include **letter n-back task** and **Edinburgh Handedness inventory**.

All terms have a brief definition. **Declarative knowledge**, for example, is defined as "Knowledge that is descriptive and includes knowing 'that' rather than knowing 'how' (can be expressed in declarative sentences)."

Beyond the definition, Cognitive Atlas includes additional information about the term specific to the concept or task classification. Concepts will often include a categorical classification, a localization image from PubBrain, and areas for discussion and research citations. Task definitions may include associated conditions, contrasts, phylogenical information, and associated indicators.

As a contributor you may interact with definitions in several different ways.

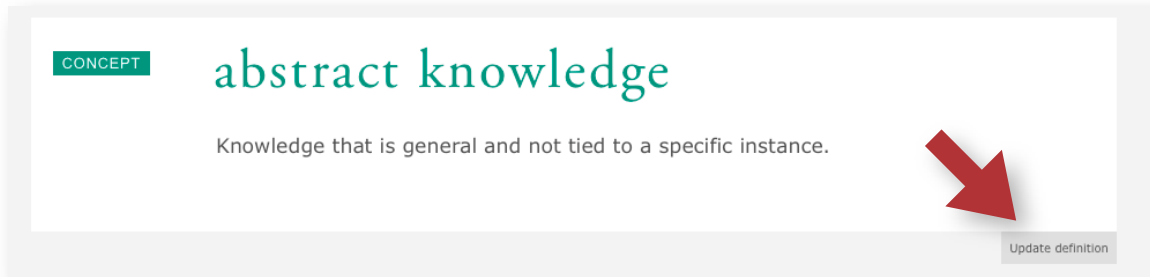
- Add definitions to existing terms in the database
- Expand existing definitions with research citations or additional information
- Express your support (or lack of support) for other user-contributed definitions

As of this writing we are focusing on defining the roughly eight hundred terms already in the database. If you can't find a term that you believe should be included, please [suggest it to Dr. Poldrack via email](#) or [add it yourself](#).

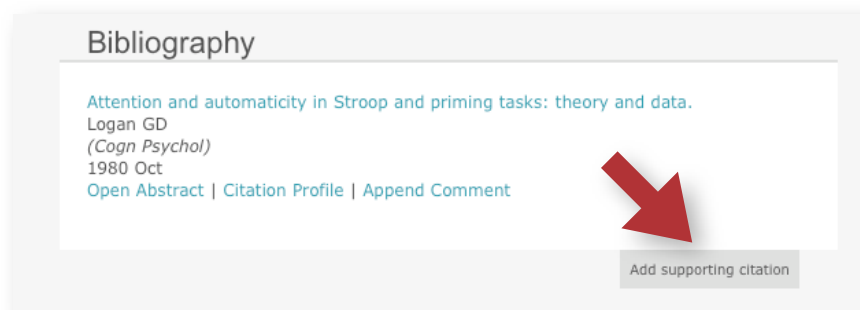
Working with existing definitions

The simplest way to contribute is to sign into the system, use the browse function to find a term you're interested in working on, then look for the grey boxes underneath the various components of a definition.

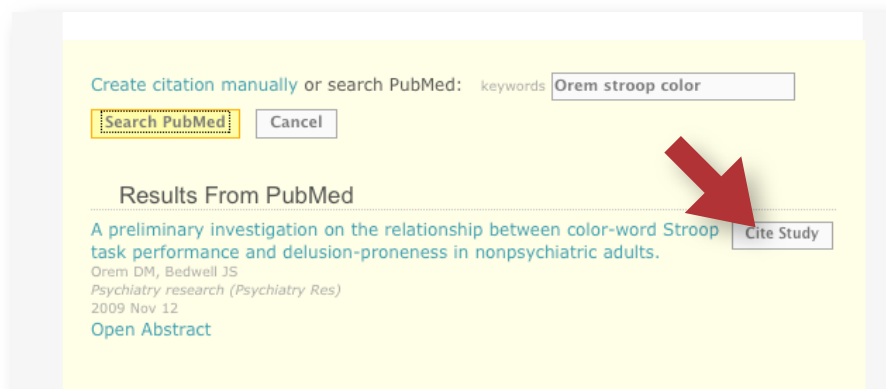
To modify an existing definition, or to define a term which currently lacks a definition, click the "update definition" button at the bottom right of the term definition box.



You may also add additional supporting information to term definitions. If you wanted to cite a PubMed article for the **Color-word Stroop Task**, for example, you may click "Add supporting citation" under the Bibliography to pull up the PubMed lookup tool.



In this example we searched for a particular paper; you could add the citation to the definition by clicking "Cite Study". You may also optionally append a comment about the citation.



Assertions

The core of Cognitive Atlas is the ability for users to make assertions connecting terms and concepts defined in the database. Assertions are structured descriptions that characterize the connections between various elements¹.

Some sample assertions:

- Declarative memory is the same as explicit memory
- declarative memory is measured by Long-delay free recall on the California Verbal Learning Test

Just as researchers may disagree about various assertions, Cognitive Atlas assumes that assertions made by users in the system will not always agree. The system allows users to make any assertion they like, even if other users disagree. Ultimately, community participation and the aggregation of definitions and assertions in the system will point towards consensus extracted from a composite of all the user-contributed elements. So don't worry if your assertions conflict with those of another user, as that's the intended use of the system.

You may [contribute your own assertions](#) or review and comment on the [assertions](#) contributed by other users.

Please bear in mind that the assertions functionality is under active development. The user interface for assertion contribution will be changing in January and February 2010. Depending on user feedback we may also be changing the way that assertions are handled in the system as well.

We would encourage users to contribute a few test assertions and provide feedback. While we are working on revising the assertion mechanism we would welcome comments from practitioners.

¹ For those familiar with Semantic Web technologies, this is how we're presenting triples in our system. While the system supports RDF and SPARQL and other Semantic Web technologies, we're deliberately avoiding explanations or interaction design metaphors that are driven primarily by the technologies.

The boring stuff

We're actively interested in partnering with like-minded projects. Exchanging information and integrating with other systems is a primary goal, so we'd like to hear from you. Please [contact Dr. Poldrack](#) if you're interested in working with us on the project.

For the technically minded, the system is a custom built PHP + MySQL system with a few different AJAX tools in use, primarily jQuery. The system does have Semantic Web support built in for information sharing, but we're not currently using RDF or OWL for any of the behind the scenes work.

For questions about the underlying plumbing of the system, feel free to contact Squishymedia Inc, the development partner for the project.

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