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How to Cite Datasets and Link to Publications

A Report of the Digital Curation Centre

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DCC/UKOLN, University of Bath

30 October 2012
Introduction

On the surface, citing datasets is a trivially easy thing to do. Style manuals such as the Publication Manual of the American Psychological Association and the Oxford Manual of Style have provided sample citations for datasets since at least the early 2000s. The process of making datasets citable, however, is rather more difficult. In consequence of this and other factors, a culture of citing datasets has been slow to develop. Nevertheless, it is vital that researchers cite the datasets they use, if datasets are to be regarded as legitimate academic outputs in their own right.

Short-term Benefits and Long-term Value

There are several short-term benefits to making datasets citable, citing them in practice, and linking datasets to papers that make use of the data.

• If the authors of a scientific publication properly cite the data that underlies it, it is much easier for the reader to locate that data. This in turn makes it easier for the reader to validate and build on the publication’s findings.

• Data citations ensure that data contributors receive proper credit when their work is reused by other researchers.

• If a dataset links back to the paper that describes its collection, a reader coming to the dataset direct can use that link to put it in context and understand the methodology used.

• If a dataset links to other papers that make use of it, these links can be used by the contributors and data publishers to demonstrate the impact of the data. Potential reusers might use these links to discover critiques of the data or to provide inspiration for how to use them.

Once a culture of data citation has been established, several other benefits are likely to become apparent.

• The publishing infrastructure that makes the data citable will also help to ensure they are available for reference and reuse long into the future.

• There will be less danger of rival researchers ‘stealing’ results from those who publish their data openly, as failure to give due credit would amount to plagiarism and thus be punishable.

• Services built around data citation will make it easier for researchers to discover relevant datasets.

• Data citations could be used to measure the impact of both individual datasets and their contributors.

• Researchers could gain professional recognition and rewards for published data in the same way as for more traditional publications.

Taking these points together, there would likely be an increase in the quantity and quality of data published, with all the benefits this implies for the transparency and rate of scientific research.
Cite Datasets and Link to Publications

This guide will help you create links between your academic publications and the underlying datasets, so that anyone viewing the publication will understand it is based on data, and the datasets authors will know it is being used.

By Alex Ball (DCC) and Monica Duke (DCC)

Published: 18 October 2011
Last updated: 20 June 2012


Available online: http://www.dcc.ac.uk/resources/how-guides/cite-datasets
Outline

Motivation

Elements of a data citation

Issues and challenges

Guidance for researchers

Guidance for data repositories

Putting it into practice
What’s great about journal papers?

- Awareness raising
- Protection from plagiarism
- Verification of results
- Basis for future research
- Reward models
- Permanent access
What’s great about journal papers?

▶ Awareness raising
▶ Protection from plagiarism
▶ Verification of results
▶ Basis for future research
▶ Reward models
▶ Permanent access
Data citations provide...

- Visibility for data
- Protection from plagiarism
- Possibility for verification of results
- Data on which to base future research
- Possibility for reward models
- Access
Four data citation styles: which elements do they use?

Altman and King (2007): Dataverse

Lawrence et al. (2008): BADC

Green (2010): OECD

Starr and Gastl (2011): DataCite
Citation styles

Author

Altman and King (2007): Dataverse
  Sidney Verba.
  NORC [Producer]:

Lawrence et al. (2008): BADC
  Iwi, A. and B. N. Lawrence

Green (2010): OECD
  OECD

Starr and Gastl (2011): DataCite
  Irino, T; Tada, R
Citation styles

Publication date

Altman and King (2007): Dataverse
  NORC [Producer];

Lawrence et al. (2008): BADC

Green (2010): OECD
- OECD (2009),
  (Accessed on 14 September 2009)

Starr and Gastl (2011): DataCite
- Irino, T; Tada, R (2009):
Citation styles

Title

Altman and King (2007): Dataverse


Lawrence et al. (2008): BADC


Green (2010): OECD


Starr and Gastl (2011): DataCite

- Irino, T; Tada, R (2009): Chemical and mineral compositions of sediments from ODP Site 127-797.
Citation styles

Version

Altman and King (2007): Dataverse


Lawrence et al. (2008): BADC


Green (2010): OECD


Starr and Gastl (2011): DataCite

### Altman and King (2007): Dataverse


### Lawrence et al. (2008): BADC


### Green (2010): OECD


### Starr and Gastl (2011): DataCite

Altman and King (2007): Dataverse
- Sidney Verba. 1998. “U.S. and Russian Social and Political Participation Data,” NORC [Producer]; data set [Type (DC)]

Lawrence et al. (2008): BADC

Green (2010): OECD

Starr and Gastl (2011): DataCite
Altman and King (2007): Dataverse


Lawrence et al. (2008): BADC


Green (2010): OECD


Starr and Gastl (2011): DataCite

Citation styles

Identifier

Altman and King (2007): Dataverse

  NORC [Producer]; data set [Type (DC)] ICPSR [Distributor].

Lawrence et al. (2008): BADC


Green (2010): OECD

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Starr and Gastl (2011): DataCite

Altman and King (2007): Dataverse


Lawrence et al. (2008): BADC


Green (2010): OECD


Starr and Gastl (2011): DataCite

Citation styles

Unique Numeric Fingerprint

Altman and King (2007): Dataverse


Lawrence et al. (2008): BADC


Green (2010): OECD


Starr and Gastl (2011): DataCite

Key citation elements

- Author
- Publication date
- Title
- Location
Key citation elements

- Author
- Publication date
- Title
- Location (= identifier)
Key citation elements

- Author
- Publication date
- Title
- Location (= identifier)
- Publisher
Attributing datasets to many contributors

http://dx.doi.org/10.1038/ng.785
Granularity

- Data points
Granularity

- Data points
- Data tables
Granularity

- Data points
- Data tables
- Data files
Granularity

- Data points
- Data tables
- Data files
- Datasets
Granularity

- Data points
- Data tables
- Data files
- Datasets
- Data collections
Granularity

- Cite datasets at the finest level that is appropriate and for which an identifier is provided.
- If that is not fine enough, provide details of the subset of data you are using at the point in the text where you make the citation.
Placement of data citations

- Special data resources section?
- Acknowledgements?
- Accession codes?
- Reference list?
Placement of data citations

- Special data resources section?
- Acknowledgements?
- Accession codes?
- Reference list?
- Alongside or independent of a reference to the related article?
Placement of data citations

» Include the citation in the reference list.
» When your data collection paper is published, notify the repository holding the dataset.
» When you publish a paper in which you reuse a prior dataset, notify the repository holding that dataset.
Dynamic datasets

Two types:

- Revised datasets
  ![Diagram showing revised datasets]

- Expanding datasets
  ![Diagram showing expanding datasets]
Dynamic datasets

Three strategies:

1. Differentiate versions by access date rather than ID
   - A
   - B
2. Take time slices
   - A
   - B
   - C
3. Take snapshots
   - A
   - B
   - C
Guidance for researchers publishing a paper

- Deposit any data you have collected and used as evidence.
- Ask for a persistent ID/URL for your deposited data.
- When your data collection paper is published, notify the repository holding the dataset.
Guidance for researchers citing a prior dataset

- Use the data citation style required by the editor/publisher.
- If no style is specified, use a standard data citation style, adapted to match the style for textual publications.
- Default to writing IDs in the form of URLs if possible.
- Include the citation in the reference list.
- Cite datasets at the finest level that is appropriate and for which an identifier is provided.
- If that is not fine enough, provide details of the subset of data you are using at the point in the text where you make the citation.
- Cite the exact version of the dataset you need.
- When your paper is published, notify the repository holding the dataset you used.
Guidance for data repositories

- Provide persistent IDs for the datasets you host.
  - The ID should remain unique.
  - The ID should always point to the same version.
  - The ID should resolve to a URL.
  - The URL should locate the dataset’s landing page.

- The explanatory metadata should not change for a dataset with a persistent ID.

- IDs should only be assigned once no further changes are expected.

- With dynamic datasets, provide IDs for snapshots or time slices.

- Provide sample citations on dataset landing pages.

- Link from landing pages to publications citing the dataset.
Putting it into practice
Advances in data citation: sorghum genome data exemplifies the new gold standard

Scott C. Edmunds1*, Tam P. Sneddon1 and Peter Li2

Abstract

The importance of formally citing scientific research data has been recognized for decades. However, the ability to store and process data is potentially faster than the ability to store and process it. Many scientific communities are making their data broadly and freely available prior to publication, but the supporting data (totaling 84 GB), such as the raw data available in NCBI [SRP005934], also has supporting data in a convenient way increases experimental transparency and rapid dissemination of research. Data is cited in the reference section of publications. The importance of formal citations is exemplified by the mouse methylome dataset [3] in the North Carolina Institute for Atmospheric Research (NCAR) repository. The mouse methylome dataset exemplifies the new gold standard.

Discussion

Once a paper is published online, it is the responsibility of the authors to ensure that the data cited in the paper is correctly cited. Many scientific communities are making their data broadly and freely available prior to publication, but the ability to store and process data is potentially faster than the ability to store and process it. The mouse methylome dataset [3] in the North Carolina Institute for Atmospheric Research (NCAR) repository. The mouse methylome dataset exemplifies the new gold standard.

Background

The importance of formally citing scientific research data has been recognized for decades. However, the ability to store and process data is potentially faster than the ability to store and process it. Many scientific communities are making their data broadly and freely available prior to publication, but the supporting data (totaling 84 GB), such as the raw data available in NCBI [SRP005934], also has supporting data in a convenient way increases experimental transparency and rapid dissemination of research. Data is cited in the reference section of publications. The importance of formal citations is exemplified by the mouse methylome dataset [3] in the North Carolina Institute for Atmospheric Research (NCAR) repository. The mouse methylome dataset exemplifies the new gold standard.

Main text

As can be seen in GigaScience that aims to be a repository for research data. This paper will provide examples from the genomics field. The Mouse Genome Data Portal (MGDP) was designed to provide a comprehensive, community-based repository for mouse genomics data. The MGDP is a community-driven repository for mouse genomics data. The MGDP is a community-driven repository for mouse genomics data.

Put the paper online where the data has been deposited, and the data is cited in the reference section of publications. The importance of formal citations is exemplified by the mouse methylome dataset [3] in the North Carolina Institute for Atmospheric Research (NCAR) repository. The mouse methylome dataset exemplifies the new gold standard.

DCC and DataCite best practice guidelines. In presenting the post-early assessment, data is cited in the reference section of publications. The importance of formally citing scientific research data has been recognized for decades. However, the ability to store and process data is potentially faster than the ability to store and process it. Many scientific communities are making their data broadly and freely available prior to publication, but the supporting data (totaling 84 GB), such as the raw data available in NCBI [SRP005934], also has supporting data in a convenient way increases experimental transparency and rapid dissemination of research. Data is cited in the reference section of publications. The importance of formal citations is exemplified by the mouse methylome dataset [3] in the North Carolina Institute for Atmospheric Research (NCAR) repository. The mouse methylome dataset exemplifies the new gold standard.
Putting it into practice
Thank you for your attention

DCC Website: http://www.dcc.ac.uk/
Monica Duke, Alex Ball: http://www.ukoln.ac.uk/ukoln/staff/

8th International Digital Curation Conference
“Infrastructure, Intelligence, Innovation: driving the Data Science agenda”
14–16 January 2013, Amsterdam
http://www.dcc.ac.uk/events/idcc13