PROFILES IN OPEN: DOROTHY BISHOP

DOROTHY BISHOP is a Professor of Development Neuropsychology at the University of Oxford, as well as a Wellcome Trust Principal Research Fellow. Her research is concerned with trying to understand the nature and causes of language impairments in children. Dr. Bishop's recent work has been particularly focused on children with developmental language disorder (DLD), who are quite common (around 3% of the population) but tend to be neglected by researchers. Ultimately, by unraveling the genetic and neurological causes of language problems, Dr. Bishop and her colleagues hope to be able to find ways of helping overcome these problems with early intervention. More immediately, her research can help identify the best conditions for teaching language skills.

Tell us a bit about your research.

I am interested in the nature and causes of disorders of language and communication in children. My research is very wide-ranging, and uses methods from linguistics, psychology, neuroscience and genetics. My current research program is focusing particularly on processing of language in the left and right side of the brain, and whether people with atypical language laterality are at risk for language disorders.

What did your funder ask of you with respect to making your research open?

For the last 20 years I have been funded by the Wellcome Trust, but more recently I have moved to work on an Advanced Grant from the European Research Council. In general, I've actually been interested in making my research open before the funders started to show an interest in this. I guess I started about five years ago, and now it's pretty routine in my research group for us to pre-register our studies and make everything open. I think both Wellcome and ERC are increasingly proactive in requiring open research from those they fund, but I've been doing this already, so it has not made any difference.

How do you make your research outputs and other materials available?

I mostly have used the Open Science Framework (a recent project may be found at https://osf.io/u2c7d/). At Oxford we do also have a repository, the Oxford University Research Archive, which we are encouraged to use. I have used that more for depositing manuscripts, rather than data. Things are changing though and I suspect I may start using the institutional archive more over time.

Our articles have typically been published in open access form for several years now. I also post preprints of papers before I submit to journals, though lately I've just gone direct to Wellcome Open Research, which has a very different publication model.

How did making your research outputs and other materials available impact further exploration of these topics?

Perhaps the most striking examples have been from people using materials and analysis scripts, rather than the actual data. I have had people write to thank me for making scripts open, because they don't need to reinvent the wheel when they want to conduct a similar analysis. As far as open data goes, it has been good when you get a request for your data - typically from someone conducting a meta-analysis - and you can immediately just point them to the link on the Open Science Framework, rather than having to hunt through ancient files which may no longer be readable or interpretable.

Did making your work more open lead to subsequent analysis and debate about your findings?

It has encouraged others to use our scripts and materials, in particular. It can be nerve-wracking because of the possibility of errors in the work you deposit, but I think this is a reason for making data open, rather than the reverse. Although it is embarrassing to make a mistake, I suspect that as more people deposit open data and scripts, it will be seen as more normative to make mistakes.

What advice would you give to other researchers who are contemplating making their work more open?

There are a lot of benefits for both science and scientists. I recently deposited a dataset for a paper that describes psychiatric diagnoses in children with a rare genetic condition. I have only scratched the surface of the results. The sample is necessarily a small one - these children are difficult to recruit - so I think that ultimately we will need to pool data from several studies to get a full picture. I feel that by making my data open, I will facilitate that. But also, I'd be delighted if another scientist wants to look at the dataset to consider new questions that I have not addressed. It was hard to gather the data, and I want it to be of maximum use. One other point that I heard from a colleague is that making data open is not just for other people - it is for you in six months' time. I've in the past had the experience of not being able to remember where I've stored data, or what specific variables mean. If you document everything properly, then you future-proof the data.

What would you like to tell funders who are thinking about embedding open science principles into their grants?

It does in general lead to better science. There are situations when you need managed access, because of potential for the data to be misused by those with a specific agenda, who may cherry-pick findings. But these days there are plenty of resources to help researchers set up a data management plan to anticipate such problems and plan in advance how data will be stored and accessed. The main thing is to plan for open, reproducible science from the outset, rather than trying to bolt it on after the research is done. I think funders have an important role to play in making science more reproducible. There will be resistance from those who want to jealously guard their data and are afraid of being "scooped", but I think the climate is changing and it is becoming less acceptable to behave that way.

Additional Resources

Profiles in Open are a service of the Open Research Funders Group (ORFG). The ORFG is a partnership of funding organizations committed to the open sharing of research outputs. Visit our website (www.orfg.org) for more resources including:

- **"Open 101" Tip Sheets**, designed to help specific audiences understand the benefits of open science
- The **"HowOpenIsIt?" Guide to Research Funder Policies**, created to help philanthropic organizations develop open policies consistent with their values
- **The ORFG Curated Reading List**, containing a wealth of scholarly research and real-world case studies that demonstrate the myriad ways in which open access and open data benefit researchers and society alike