How to write a science news story based on a research paper

The , in association with the Guardian and the Observer, is open for entries. In parallel with the competition we're publishing a series of weekly "how to ..." guides for budding science journalists

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Friday 28 March 2014 11.18 GMT

Most journalists want to break exclusives, but a lot of what science journalists write is neccesarily based on the latest research findings, published for all the world to see in academic journals. Exclusive they are not. Nevertheless, it is perfectly possible to write a great news story that takes the contents of a research paper as its starting point. Here are some guidelines.

1. Find a good paper

Thousands of scientific papers are published each week. The majority will not make good news stories. Look for work that is entertaining, fascinating, important or controversial. Ask yourself: will anyone care? Be brutal about this. Move on if the answer is no.

2. Read it

You cannot cover a paper properly without reading it. The abstract will give the barest essentials. You need to read the introduction for context, the discussion and conclusions for take-home messages. Check the methods. Was the experiment well designed? Was it large enough to draw conclusions from? Find weaknesses and flaws. You will probably need help to work out how fatal they are. Spend time on the results. Have the authors omitted key data? Look at odds ratios, error bars, fitted curves and statistical significances. Are the results robust? Do they back up the scientists' conclusions? Remember: nematodes, fruit flies and mice are not humans, and what happens in a Petri dish won't neccesarily happen in a person. Read the supplementary material too. You will find gems.

3. Vested interests

Check for conflicts of interest. These should be declared at the end of the paper, but make your own checks too. Plenty of scientists have financial links with companies. The reader might want to know about them.

4. Get context

Science builds on science. Know the previous studies that matter so you can paint a fuller picture. If your story is about chimps in Guinea using cleavers and anvils, you might mention the different tools that chimps in the Republic of Congo use for termite fishing.

5. Interview the authors

Write from the paper alone and your news story will be dull. Interviews with authors will give you the colour to tell a story. How did the face transplant patient react when they looked in the mirror? What possessed the authors to study spiders on cocaine? How did it feel to unearth the remnants of an ancient hearth, knowing a Neanderthal sat in the same spot 40,000 years ago?

Get them to explain their results and justify their conclusions. What do the results mean in plain English? What do they not mean? Ask your questions in simple language to get answers you can quote. Run phrases you might use past the authors, so they can warn you of howlers. Do not ask multi-part questions: you will not get full answers.

Remember that papers can take months to appear in journals, so find out how the work has moved on since the work was submitted.

Think about whom you want to interview. First authors are generally the graduate students or postdocs who did all the work. Last authors are often senior scientists. On a good day, a senior author will give you the clearest explanation, the perfect quote, and the richest context. On a bad day, they will have no recollection of the paper their name appears on.

6. Get other scientists' opinions

Send the paper to a handful of experts to check. You will find people in the paper's references, or on Google Scholar. Chat about the paper on the phone. Some scientists will email you thick paragraphs of reaction. You might salvage a sentence or two, but email makes for clunky quotes: people do not speak the way they write. Ask your expert if the work looks sound or flakey. What does it add? What is the striking result? Will it be controversial? What fresh questions does it raise? Comments from other scientists will always improve your story. They will also save you from writing a story you wish you had never touched.

7. Find the top line

You've read the paper, interviewed the authors and discussed the work with other experts. Now you need to find the top line. One option is what drew you to the paper in the first place. But there will be others. Go over your interviews. What stood out as most fascinating, alarming, amusing, or important? Does it make for a stronger angle? Bear in mind that the story you should tell your readers might not be the story the authors want you to tell your readers.

8. Remember whom you are writing for

The reader may be clever and curious about the world. But do not assume they are a scientist, or that they have time to read boring, unimportant or incoherent stories. Make your story clear and informed. Science is hard enough, so use simple words. Do not patronise the reader. Respect them and be honest. Make them glad they read you.

9. Be right

Don't write a story that is wrong. This is harder than it sounds. Most scientific papers are wrong, thanks to poor study designs, author biases, small sample sizes and other problems. So don't make things worse by introducing errors of your own. Check everything. Mistakes leave readers confused and misinformed. They will undermine your credibility too. Call a shrew a rodent and your soricid story is ruined.

10. Write well

Reporters often pick the same papers to cover. Why should anyone read you? You must have something to add. Make an effort to get the details that readers want to know. And learn how to write well. Find a clear path through the story and build one paragraph after another in logical order. Stick to one idea for each paragraph. Read Strunk and White until you can hear them tutting as your type. Even the shortest stories can be memorable in the hands of a good writer.

Do ...

- Speak to the authors and get independent comment from scientists in the same field.
- Get your facts straight.

Don't ...

- Patronise your readers.
- Mistake fruit flies, mice or Petri dishes for people.

Click here to enter the Wellcome Trust Science Writing Prize, in association with the Guardian and the Observer. The closing date for entries is 11 May 2014

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