



## Science Magazine Podcast Transcript, 29 November 2013

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### *Music*

#### **Host – Kristy Hamilton**

Welcome to the *Science* Podcast for November 29<sup>th</sup>, 2013. I'm Kristy Hamilton.

#### **Host – Sarah Crespi**

And I'm Sarah Crespi. This week on the show we have stories on some of the top kids' books from 2013 [00:53], what newlyweds know about their chances for happiness [08:14], and China's authorship bazaar [16:21]...

#### **Interviewee – Mara Hvistendahl**

We tracked a paper from a moment that it was sent out and offered for sale to publication, and we confirmed that it was in fact published.

#### **AAAS Promo**

Support for the Science Podcast is provided by AAAS: the American Association for the Advancement of Science. AAAS—the Science Society—at [www.aaas.org](http://www.aaas.org).

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[00:53]

#### **Host – Kristy Hamilton**

The AAAS/Subaru Science Books and Films Prize celebrates outstanding science writing and illustration books for children. Prizes are awarded in four categories: Picture Book, Middle Grade Nonfiction, Young Adult, and Hands-On. The 2014 finalists cover an array of topics from the fossil hunting exploits of a father and son to the inner workings of the human digestive system. Maria Sosa, Editor-in-Chief for SB&F at AAAS, begins by describing the first category.

#### **Interviewee – Maria Sosa**

In this category we look for nonfiction that tries to target some kind of learning goal that, you know, we feel would be something that they would need to learn. And the judges look for something that's written very nicely because this is a book you would read with a child, and so it would be something that could be read aloud. And, of course, then we have another round of judges that are scientists, after the literacy experts look at it, and they look for errors and things like that.

#### **Interviewer – Kristy Hamilton**

Can you give us a glimpse into some of these books that are up for consideration?

#### **Interviewee – Maria Sosa**

Okay. This year the photography book – it's called It's Our Garden – and it's all about a school garden. So the author who's also the photographer became fascinated with walking by the school and seeing the kids gardening, so he actually followed them through the course of a school year and it could be used to inspire kids to garden, could be used by a teacher to be inspired to create a school garden, so it's a really nice book. The second book is Things That Float and Things That Don't, and that's exactly what you would think it is. It's basically going through things that are in a house and asking kids whether they would sink or float, and then urging them to try it – which kind of reminds me of a David Letterman skit that he used to have when he would drop things into a big vat of water and the audience was supposed to guess if it sank or floated. So that book is also very... I think that of all of them, that might have the least amount of checks and I think kids could really easily pick it up and go on their own on that one. And Too Hot, Too Cold is following two human kids and also other animals and how they regulate their temperature in cold, which is something kind of unusual, I haven't seen that in a kid's book. So those are the three children's picture books.

**Interviewer – Kristy Hamilton**

And so moving up the age ladder with middle grade books, who are some of the finalists and why were they chosen?

**Interviewee – Maria Sosa**

Well, the middle grades category is always an interesting one because it would range from five to eighth grade, so the books look like picture books but they can run anywhere from 68 pages to 100 pages. And this year we have two nominees from the same series, Scientists in the Field, which is published by Houghton Mifflin. And it's a terrific series because it follows researchers doing actual research. And unlike some series where each book looks the same, they're very different on the inside and they really have the voice of the authors who immerse themselves in the work of the scientists. So one of them is on wild horse scientists, and that's centered around the researchers in Assateague Park and Chincoteague. Also one called Eruption, which is Scientists in the Field, and that one is following volcano researchers.

**Interviewer – Kristy Hamilton**

I really like the adventure that seems to be sort of embedded in science and trying to break that stereotype of science being dull and part of school.

**Interviewee – Maria Sosa**

Yeah, and that's what's great about this series because it really is in the field. And the other one, Finding A Fossil, with a father and son. The father is a researcher, so he takes his son out with him sometimes to look for things. And the book begins with the son saying, "Dad, I found something." And Dad, who authored the book, is sort of like, okay, yeah, nice, that's nice. But then it turns out to be a really, really, really important fossil.

**Interviewer – Kristy Hamilton**

And so in the children's hands-on category, what do you think makes a good interactive book?

**Interviewee – Maria Sosa**

Well, that's very interesting because this category has really been evolving. This year we have a book called Beyond the Solar System, which is unusual because I don't think we've ever had a book with hands-on astronomy activities, but they're great. And the reason that they work is by trying to model for them the scale and some of the ideas that would help them understand how the stars work. So that one is very, very wonderful. There's a bird watching book called Look Up. I think it's really great that this sort of is more of a how-to for them instead of just pages of pictures of birds. And Ellie's Log is actually almost more of a story because it's based on a little girl Ellie and her friend going out and being nature observers and keeping a log.

**Interviewer – Kristy Hamilton**

So on the fourth and final category, young adult science, how did these finalists excel at capturing the attention of teen and young adult readers?

**Interviewee – Maria Sosa**

Well, we have a separate panel that looks at the young adult books, and they're high school teachers, science librarians, and public library specialists for teen audiences. So Mary Roach's book Gulp is one of the nominees. I loved it and I'm hearing it consistently, yes, yes. Even though it's got a lot of gross things, we would definitely use this book in a class, recommend it to kids. So I find that very heartening because I love her and she looks at... I love it because she sort of makes heroes of some of the unsung heroes of research – a saliva specialist – I mean people that you don't really think about. E. O. Wilson's book that was nominated this year is Letters to a Young Scientist, and that is written for teenagers. I mean, I think if there's a theme this year, the theme is doing science because that's what he's talking about – his career, what he was like as a child. He gives advice. Not everybody likes his advice, especially the one about math when he says you don't have to be like the super-genius math wizard to be a scientist. That's controversial to some people. And the other one is Frankenstein's Cat, which is about how animals have been engineered to be used in research. And it's a great cover, I love it. And then Mirror Earth is about pretty new cutting-edge research on exoplanets. They were portrayed as almost like your vision of the NASA guy – I mean, they're out there, they're so excited, they're looking for these planets. And so our panel thought that the kids would be really sucked into that whole quest.

**Interviewer – Kristy Hamilton**

And so when will the winners be announced?

**Interviewee – Maria Sosa**

The winners will be announced the beginning of January when we draw up our January issue of *SB&F*. The winner gets a plaque and a fifteen-hundred dollar check. We actually award the prizes at the annual meeting. We have a reception and we also have the winners come and sign books, and people can talk to them at the annual meeting.

**Interviewer – Kristy Hamilton**

Well, Maria Sosa, thanks for talking with me.

**Interviewee – Maria Sosa**

Thank you very much.

**Host – Kristy Hamilton**

For more information on the finalists, you can read about them in this week's issue, along with reviews of the books under consideration for the UK Royal Society's Young People's Book Prize.

*Music*

[08:14]

**Host – Sarah Crespi**

Since the late 1990s, researchers have been testing implicit associations by timing how long it takes subjects to match an image with a fitting or unfitting attribute. For example, it takes less time to designate a flower as “pleasant” than to link the word “pleasant” with an image of an insect. This type of research has provided access into associations that many people would either be unable to explicitly state or outright refuse to acknowledge. For example, implicit association testing has revealed unconscious bias against people of different races. In this type of testing, it might take more time to associate a person of another race with a positive word. In recent study, James McNulty and colleagues used this method to gain insight into the relationships of newly married couples. I spoke with him about what newlyweds explicitly say about their significant other and what their implicit attitudes seem to show.

**Interviewee – James McNulty**

There's basically two important findings, I think, of this study. We assessed people's more conscious attitudes towards their marriages—the feelings that they were very aware of and had thought about—and then their more automatic or gut-level feelings about their marriage. And the first finding was that those two feelings were unrelated to one another. And the second interesting finding is that it was the gut-level feelings, not the more conscious ones, that predicted the outcomes of their marriages over time, such that people who had these more positive gut-level feelings stayed happier longer.

**Interviewer – Sarah Crespi**

Okay. One of the unique things about this study is your sample. Can you describe the couples involved, how many there were, and how long they stayed involved?

**Interviewee – James McNulty**

Yes. It was 135 couples and they were newlyweds, and it was both members of the couple. And they actually came into our laboratories together within about six months of their marriage. And then we did a few tasks that were involved in the study, these measures of conscious and automatic attitudes. And then every six months for the next four years we stayed in touch with them and had them complete measures of marital satisfaction so that we could see how happy they remained over those four years.

**Interviewer – Sarah Crespi**

So it was a panel study where you had the same people coming back and giving you repeated measures.

**Interviewee – James McNulty**

Yes, exactly.

**Interviewer – Sarah Crespi**

In addition to these explicit measures where you ask people how they think their relationship is going, you also looked at automatic attitudes or implicit attitudes. How did you gauge the latter?

**Interviewee – James McNulty**

Yeah, that was the trickier one to measure. And there's been a few very similar techniques that have been established for measuring these gut-level responses that people might not be willing to verbalize, or even able to verbalize. Sometimes people might not even be aware of these gut-level feelings, so what we have to do is we have to measure them a different way than through self-report. And what we did in this particular case was we had people indicate whether clearly positive and negative words were, in fact, positive and negative, but they did so after we briefly flashed a picture of their partner on a computer screen. So for about a third of a second they see a picture of their partner, and then they have to indicate whether the word "awful" is a good word or a bad or, or the word "awesome" is a good word or a bad word.

**Interviewer – Sarah Crespi**

So you were looking to see if being exposed to an image of their partner influenced their ability to detect good or bad words?

**Interviewee – James McNulty**

Yes. So seeing the picture of the partner activates whatever their automatic attitude is, and if it's a very positive one it makes it very easy to indicate that the word "awesome" is a positive word, and it makes it difficult to indicate that "awful" is a bad word, because we don't typically... if you have a very positive automatic attitude, you don't typically think of your partner as awful. So it takes longer for them to indicate that the word "awful" is a negative word. And so we record their reaction time and that serves as an indicator of their positivity of their automatic attitude.

**Interviewer – Sarah Crespi**

When you compared those values, the automatic attitude with what the couples were reporting about their relationship, how close were these measurements within a person or within a couple?

**Interviewee – James McNulty**

They actually tended not to be very related to one another. People who said they were very happy, sometimes their automatic attitude suggested they were, indeed, really happy

at the implicit level. But sometimes the two were discrepant within people. The people might say they were very happy at the explicit level, but they weren't quite that happy at the implicit level. So the two measures of attitudes were actually uncorrelated in the study.

**Interviewer – Sarah Crespi**

So over time, how did these measures correlate with what happened to the relationships?

**Interviewee – James McNulty**

The more conscious attitudes, although they were related to how happy people were in the beginning of the marriage, they didn't predict how happy they stayed over time at all. In fact, it was just the automatic attitudes that predicted how happy people were. So that length of time that it took people to respond to indicate whether a word was positive or negative actually predicted how happy they remained over time, whereas this conscious attitude—how happy people said they were—did not predict how happy they stayed over time.

**Interviewer – Sarah Crespi**

And how did you measure how happy they were at the end of the study?

**Interviewee – James McNulty**

So every six months for the four years of the study, we basically used a pretty standard measure of marital satisfaction where we asked them questions like all things considered, how happy are you in your relationship. And most people started out very happy in the beginning, they had just gotten married, but over time some people remain happy, whereas other people according to these measures become unhappy, or relatively less happy, with their relationships over time.

**Interviewer – Sarah Crespi**

We're looking at their reported marital satisfaction at the end of the study. Why should we take their word for it there when at the beginning of the study we know that there's a big discrepancy between this explicit and implicit feeling about the couple's relationship?

**Interviewee – James McNulty**

That's a good question. I think what probably happens is at least temporarily and at least when people first get married, they're able to convince themselves that they are happy. And that's why it's difficult to trust the conscious attitude at the beginning of the relationship is because people are highly motivated to think they're in a good relationship, and those motives can distort how happy they think they are at any one point in time. But over the course of time people are not necessarily able to hold onto that belief. And eventually even that conscious report can erode over time, and that's why the automatic attitude might be a better predictor—or seems to be a better predictor—of even the trajectory of the conscious attitude because it is able to predict better how people are really feeling. And those real feelings are eventually going to come through.

**Interviewer – Sarah Crespi**

So let's talk about how this might apply to our lives outside of marriage. Does it tell us something larger about the way our unconscious attitudes need to be paid attention to or how they may be affecting our behavior?

**Interviewee – James McNulty**

Absolutely. There's been a number of theories over the last few decades actually arguing fairly persuasively that things that happen outside of our awareness can affect our behaviors. And this study joins some others in demonstrating that that is, in fact, the case. And so it's not just in our relationships, but any strong automatic thought or feeling that we might have could predict our behavior. So research on how people evaluate other groups and other non-close relationship partners might have similar implications. If people have strong negative automatic attitudes towards other groups, for example, there's research suggesting they might be more likely to discriminate against those groups, even if they're unwilling to report those attitudes at the conscious level.

**Interviewer – Sarah Crespi**

Well, Jim McNulty, thanks so much.

**Interviewee – James McNulty**

Thank you.

**Host – Sarah Crespi**

James McNulty and colleagues write about implicit versus explicit attitudes of newlyweds in this week's issue.

**Music**

[16:21]

**Host – Kristy Hamilton**

From counterfeit gadgets to the illegal ivory trade, it's no secret that China's lucrative black markets have become a source of income for many. Mara Hvistendahl spoke with Linda Poon about a 5-month-long undercover investigation by *Science* that has unveiled an academic black market where one can buy anything from an authorship spot on a paper to a wholesale manuscript to publish in a journal. In their investigation, reporters looked into 27 agencies that offer these services.

**Interviewee – Mara Hvistendahl**

We got a tip that these paper-selling companies were operating in China, offering authorship spots for sale. And it was pretty quickly that we confirmed that there were, in fact, businesses doing this. If you just go into a Chinese search engine and enter "science citation index SCI paper" you come up with all these companies that are offering—they can guarantee publication; they'll list the journals that they will get your paper published in. And, you know, they list all kinds of contact information. They have agents working ten hours a day. There are probably over a hundred, certainly dozens of these companies in existence. But it was harder to confirm that these sales are actually taking place so that these papers are getting published and that scientists aren't just getting cheated.

**Interviewer – Linda Poon**

So how were you able to confirm this tip?

**Interviewee – Mara Hvistendahl**

So we followed one company in particular over several months. It's a company called Wanfang Huizhi based on Beijing, and we tracked a paper from the moment that it was sent out and offered for sale to publication. And we confirmed that this paper was, in fact, published. Our reporting for that and with other companies all happened undercover which is not a very conventional method of reporting for *Science* stories, but it was the only way that we could get this information.

**Interviewer – Linda Poon**

As you mentioned, this isn't just a one-person business, it's an actual market. How big is this market exactly and what are the different kinds of goods and services being sold? Is it just authorship?

**Interviewee – Mara Hvistendahl**

The goal is to get your name on an SCI paper. Because of the way China's incentive system works, that's what everyone wants. But there are several ways that you can do that. So these dozens of companies, they range from kind of a grad student who sells papers he's written on his blog that he's willing to just hand over to you for some money to a much more sophisticated company like Wanfang Huizhi which is supposedly selling authorship spots on papers that have been written by other scientists. And those scientists keep their names on the paper and bring on one or two or three or four additional scientists, and this is presumably a more secure method because you can do it after the paper's already gone through one round of peer review. And there are at least some authors on the paper who have written it, who have been involved in the research, and then you're just kind of coming on at the last minute. Another service you can get is just to flat out commission a paper. You decide you want a paper on this topic and find a company that's going to be able to do it. And many of these companies operate online, so they have websites on which they openly describe what services they have available. And a lot of discussion happens through this chat program called QQ, where you can also be relatively anonymous so people don't know who you are.

**Interviewer – Linda Poon**

So some companies actually offer to write an entire paper which isn't exactly a simple thing to do. You need to conduct an experiment; you need to have data, analyze data. How are they able to provide this kind of complex product?

**Interviewee – Mara Hvistendahl**

Buying papers where all of the data has been created, it's a complicated scenario for a lot of Chinese scientists because they need papers right away. So what many will do instead is actually buy meta-analysis papers. And this is something that a lot of companies focus on and a lot offer. So they'll write these review papers, which don't require conducting experiments, you know, you don't need to generate data. It's a bit more secure for the scientists in that, you know, with data you don't know where it comes from or if it's

accurate. And with review papers the turn-around can be quite quick, a few weeks or, you know, often if you contact a company and say I need a meta-analysis paper on this specific topic, they'll have one ready at that point.

**Interviewer – Linda Poon**

So you mentioned that one of the things that really drives this market is the immense pressure for scientists to get publications out. What is it about China's academic environment that allows this market to really flourish?

**Interviewee – Mara Hvistendahl**

Chinese scientists are under extreme pressure to publish in international journals. At many universities, SCI papers, they're the deciding factor in promotions. For example, you might need to get three SCI papers published within five years in order to be promoted or even keep your position. And you have to be the corresponding author or the first author on those papers in order for those to count. So it's a lot of pressure. PhD students have to publish as well, and these requirements are often very cut and dry, and, you know, if you don't make the cut your career is on the line. And in addition to promotion requirements, they have these financial rewards. So scientists can get tens of thousands of dollars at some institutions for publishing an SCI paper.

**Interviewer – Linda Poon**

So China is becoming a powerhouse in scientific publishing. They're significantly increasing their publication output and they're boosting funding for science. With the publication of this article, what effect do you think it will have on the country's current standing in the scientific world?

**Interviewee – Mara Hvistendahl**

That's a tough question, but it may mean some more scrutiny on Chinese authors when they submit papers, some of which would be warranted. Editors should keep in mind that it's not, from what we found, the majority of Chinese scientists who are buying papers; it's a small number of people but enough that it drives this industry. And the other thing is that I would not be very surprised if this is found to be a problem in other countries where incentives are skewed in this way. So we heard from an editor in India while conducting this investigation that there are paper-selling companies thriving there as well and for somewhat similar reasons.

**Interviewer – Linda Poon**

You mentioned in your article that some of these papers have managed to pass the reviewing process at many academic journals overseas. Why is that?

**Interviewee – Mara Hvistendahl**

The companies can exploit what we might think of as a kind of loophole in the peer review process. So once your paper has gone through one round of review, if you're asked to revise it and do substantial amount of research, authors may need to add additional authors. You know, you may bring on a scientist to help with a new experiment that the reviewers ask for. And so that's when certain authors of papers

might slip them in. And that's what appeared to have happened with the one paper that we tracked over several months. We did have a lot of contact with the editors of the journal that published that paper, and in that case the authors did not submit a letter explaining the change and asking to add an additional author and so it sort of slipped under the radar.

**Interviewer – Linda Poon**

So what are some ways to combat this kind of fraud, both in China as well as overseas?

**Interviewee – Mara Hvistendahl**

One aspect is beefing up authorship standards, so asking for an explanation of what each scientist has done when they submit a paper. And that's something that a number of medical journals have started doing, but that could be done at more journals. And in some journals they'll even ask for a guarantor, like one author to say I vouch for the quality of this work and the veracity of it and really serve as a contact if any issues come up, beyond what a corresponding author would normally do. But it's a difficult thing for editors to monitor because there's nothing like CrossCheck which would help them look for plagiarism. And you have to be vigilant about requests to add authors at the last minute. That's something that honest editors at SCI journals in China now take very seriously. So I've heard from editors. When they get a request to add an author at a late stage, it's often a red flag for them. For editors at international journals who are not aware that paper-selling is going on on the level it is, it's a much more difficult thing to combat.

**Interviewer – Linda Poon**

Alright, Mara Hvistendahl, thank you so much.

**Interviewee – Mara Hvistendahl**

Thank you.

**Host – Kristy Hamilton**

With the help of undercover reporters, Mara Hvistendahl reports on the investigation into China's academic bazaar in this week's issue.

*Music*

**Host – Sarah Crespi**

This week in *Science*. On the site this week you can read a trio of papers on lighter hydrogenation catalysts, also a Report on the link between breast cancer and obesity, and in a second News Focus story, you can read a profile of Jack Szostak and his efforts to make living cells from scratch. You can check out all these stories and more at [www.sciencemag.org](http://www.sciencemag.org).

*Music*

**Host – Sarah Crespi**

And that concludes the November 29<sup>th</sup>, 2013 edition of the *Science* Podcast.

**Host – Kristy Hamilton**

If you have any comments or suggestions for the show, please write us at [sciencepodcast@aaas.org](mailto:sciencepodcast@aaas.org).

**Host – Sarah Crespi**

The show is a production of *Science* Magazine. Jeffrey Cook composed the music. I'm Sarah Crespi.

**Host – Kristy Hamilton**

And I'm Kristy Hamilton. On behalf of *Science* Magazine and its publisher, AAAS, thanks for joining us.

*Music ends*