



Science Magazine Podcast Transcript, 9 August 2013

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Promo

The following is an excerpt from the *Science* Podcast. To hear the whole show, visit www.sciencemag.org and click on “*Science* Podcast.”

Music

Finally today, Kelly Servick is an intern for *ScienceNOW*. She’s here to talk with me about some recent stories from our daily news site. I’m Sarah Crespi. So first up we have a story on genetic mixing in India. India has a history of castes – different groups that don’t intermarry. But that wasn’t always the case and it can be shown with genetic evidence. What are we finding out about this?

Interviewee – Kelly Servick

Well, so this research is looking at the fact that India has this incredibly diverse population of 1.24 billion people and at least 700 different ethnic and language groups that right now really don’t intermarry very often. But this evidence is suggesting that that wasn’t always the case, and that in fact, originally, there was a lot of intermarriage that sort of accounts for the genetic diversity that we see today.

Interviewer – Sarah Crespi

Alright. So what’s the history of the population of this continent?

Interviewee – Kelly Servick

Well scientists now think that originally there were these two major population groups in India: this ancestral North Indian group and ancestral South Indians. And the North Indians probably came from the Middle East and Central Asia and Europe about 8,000 years ago or possibly more. And then the ancestral South Indians, they believe, have been there much longer and were considered to be native to the region. And at some point these groups began to mix, but it wasn’t known until now just when that happened.

Interviewer – Sarah Crespi

And so what was the method that they used here to get this new result?

Interviewee – Kelly Servick

Well this study looked at genetic data from a pretty big group; it was 571 people in 73 different ethnic and language groups. And they looked at the genetic differences on a massive scale. They looked at 500,000 genetic markers on these individuals’ DNA.

Interviewer – Sarah Crespi

And so you say they found that there's been a change in the way these populations mix.

Interviewee – Kelly Servick

Yes. So they got more details about this sort of intermarriage period that happened that accounts for all these genetic changes. There was this sort of flurry of intermarriage between those two major groups starting, they believe, about 4,200 years ago and lasting more than two millennia.

Interviewer – Sarah Crespi

And then they saw the rise of castes, which is basically these small groups that don't get together any more. Do they know what caused that big shift?

Interviewee – Kelly Servick

That's not really clear. They do know that about 1,900 years ago there was this dramatic change and people started to have a different attitude toward intermarriage. And they do think that the caste system plays a role, the fact that there were these four main social classes that really didn't intermarry. But that's something that they're going to have to look more into, sort of the cultural factors at play here.

Interviewer – Sarah Crespi

Next up we have a story on the effects of caffeine on fetal mice. When doctors advise women on what to avoid during pregnancy, caffeine usually gets a pass – one cup a day, no problem. But a recent mouse study suggests overdoing it might be a bad idea.

Interviewee – Kelly Servick

Yes. So the standard advice that mothers are getting right now is that some small amount of coffee is okay but probably not more than a cup or two a day, and that's based on some relatively recent sort of review research. But this new study is looking at mice to see if the influence of caffeine could change the way that the fetus develops.

Interviewer – Sarah Crespi

So let's talk about the older evidence first. How strong is the evidence that caffeine is actually safe for pregnant women?

Interviewee – Kelly Servick

Well there's no large-scale study that has shown a major negative effect of caffeine exposure at this point, but there is some indication that the effects of caffeine deserve a second look. For example, the amount of caffeine that's in a venti coffee at Starbucks has 410 mg of caffeine, and that's actually more than the current recommendations from the American College of Obstetrics and Gynecologists on that.

Interviewer – Sarah Crespi

And which one's the venti?

Interviewee – Kelly Servick

The biggest one.

Interviewer – Sarah Crespi

Okay. So how did they go about looking at it and maybe providing more details for this study?

Interviewee – Kelly Servick

So they were looking at groups of fetal mice, and in particular this very small group of cells in the mouse's brain, these types of neurons called GABA neurons. And those neurons control the electrical impulses of the cells around them and they're really important when the mouse is developing. They migrate from one part of the brain to another, the hippocampus, which ends up being a really important region for memory and for learning. So they looked at the brain development of these mice. Their mothers had been drinking water that was laced with caffeine equivalent to about the amount that a human would get from three or four cups of coffee a day.

Interviewer – Sarah Crespi

So they found that there were some effects on the offspring of these caffeine-drinking moms. What did they see?

Interviewee – Kelly Servick

Well, they saw that the GABA neurons were really slow to migrate into the hippocampus. So they looked at these baby mice about six days after their birth and they saw that there were 40% fewer GABA neurons in the hippocampus, that important memory area of the brain. A few months later the quantity of neurons was the same in the normal mice and the caffeine mice, so the neurons got there eventually but they were delayed.

Interviewer – Sarah Crespi

And was this a long-lasting effect then?

Interviewee – Kelly Servick

The long-lasting effects were minimal, but they did see that the mice that had that caffeine exposure did worse on memory tests and they were more susceptible to seizures.

Interviewer – Sarah Crespi

Okay. Well there have to be some caveats here, starting with the fact that the study was done in mice. What else do we have to worry about?

Interviewee – Kelly Servick

Absolutely. Aside from the fact that they don't know if these effects would be the same

as in humans, they also were looking at this very small group of brain cells. So that doesn't really tell us how the brain in general is going to react to the influence of caffeine, and so the researchers say that they're not really ready to make any new recommendations for expecting moms.

Interviewer – Sarah Crespi

Finally, we have a story on the long social memory of dolphins. We've recently learned that dolphins have names, signature whistles that they use amongst themselves. So obviously the next question is just how memorable are these names?

Interviewee – Kelly Servick

They are really memorable. This is what one sounds like [sound]. So every dolphin has this unique whistle, kind of like a signature sound that it has, and other dolphins can learn and mimic that whistle. And it seems like they use it the way that we use names. So if a dolphin hears someone mimic its signature whistle then it's going to answer back, just like when we hear someone call our name. And dolphins use this because in their society they're constantly splitting up and joining new groups and returning to their old groups and moving over large distances. So this helps them to communicate and to reconnect with one another after those separations.

Interviewer – Sarah Crespi

So how do they test whether a dolphin remembers another dolphin's name?

Interviewee – Kelly Servick

Well this group of researchers looked at 43 dolphins that were at different captive facilities. And over the years they'd been rotating between different facilities for breeding, so many of them had lived together and then been separated. And so they would take a dolphin and put this underwater speaker in its tank and play the signature whistles of other dolphins as it swam past. And when they played the whistle from a stranger that this dolphin hadn't spent any time with, it didn't pay much attention, wasn't really interested. But when they played the whistle from an old companion, one that this dolphin had lived with in the past, it would swim over immediately and seem really stimulated by that sound as if it was recalling that absent friend.

Interviewer – Sarah Crespi

Wow! So how long were they able to show that a dolphin could remember a buddy?

Interviewee – Kelly Servick

Well, some of these dolphins had been separated for more than 20 years. So, for example, there were these two dolphins, Ali and Bailey, and they had lived together when they were very young, but Bailey still seemed to recognize Ali's whistle all those years later.

Interviewer – Sarah Crespi

Now that we know that they can remember these signature whistles for so long, what are the next steps in following up on this research?

Interviewee – Kelly Servick

Well these scientists would really like to know whether the dolphins are actually making a mental picture of their old friend or if they're just sort of hearing this familiar sound. And that kind of research has already been done in horses before, so the next step is to see just what's going on in those dolphins' heads.

Interviewer – Sarah Crespi

Okay. So what else is on the site this week, Kelly?

Interviewee – Kelly Servick

Well, for *ScienceNOW* we've got an account of the first 100% lab-grown beef patty that was unveiled and grilled up before a live audience. And for our policy blog, *ScienceInsider*, we have several stories including coverage of the House Science Committee's decision to subpoena the Environmental Protection Agency for data from air pollution studies.

Interviewer – Sarah Crespi

Alright, well I'll check those out. Thanks, Kelly.

Interviewee – Kelly Servick

Thank you, Sarah.

Interviewer – Sarah Crespi

Kelly Servick is an intern for *Science's* daily news site, *ScienceNOW*. I'm Sarah Crespi. You can check out the latest news, and the policy blog, *ScienceInsider*, at news.sciencemag.org.