Science Magazine Podcast

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Promo

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Music

Interviewer – Sarah Crespi

Finally today, David Grimm, online news editor for *Science*, is here to give us a rundown of some of the recent stories from our daily news site. I'm Sarah Crespi. So Dave, first up, we have a story on behavior in crowds. Is applauding after a performance or talk mob behavior – do we do it just to show appreciation or are we just trying to fit in?

Interviewee – David Grimm

Well it turns out there's an element of peer pressure to applause. And just because people are applauding doesn't always mean that the talk or the presentation or the performance was very good. This study has to do with a group of students that were filmed by researchers at the University of Leeds, and these students were watching a variety of oral presentations – some by undergraduates, some by postgraduates. The researchers took the video of the presentation and the audience response back to the lab and then they did some pretty heavy analysis of what they saw.

Interviewer – Sarah Crespi

So how much of the clapping that we do is actually due to peer pressure?

Interviewee – David Grimm

Well, it turns out quite a bit of it. Obviously, some people are going to start clapping right away, but it turns out that a lot of the other people in the audience are waiting to hear what everybody else is doing. And what the researchers found is if about 50% of the audience was clapping, individuals were 10 times more likely to start clapping than if only about 5% of the audience was clapping. And the same held true for why people stop clapping. People are actually waiting for others to stop clapping before they stop clapping themselves.

Interviewer – Sarah Crespi

I was wondering why we didn't just keep clapping forever. So is this the same thing you would see for booing?

Interviewee – David Grimm

Well, so it's a little bit different for booing. Booing is what's known as more of a high-risk activity. That's why you don't hear booing a whole lot. With booing, there tends to more of a tipping point, so a certain number of people have to start booing before you see this massive amount joining in, whereas with the clapping, there's not this threshold that

a certain number of people have to be clapping before others start clapping in large numbers. It's sort of more of an impact on the individual person. And with clapping, you don't really see this large surge once you hit this tipping point like you see with booing.

Interviewer – Sarah Crespi
Okay, well, is there any relationship between how much clapping – or how much booing even – and how the performance was?

Interviewee – David Grimm
Well, that was one of the really surprising things the researchers found was that the applause for a bad presentation could be just as long as the applause for a good one. They found that it was really had to do with these, sort of, interactions among the audience, and sometimes very random interactions, that determined how long the applause went on.

Interviewer – Sarah Crespi
So that's it for the applause meter.

Interviewee – David Grimm
Right? So you know, the next time you hear a lot of applause and you don't think it was that great of a performance, you may not just be being a snob. There may be actually something else going on.

Interviewer – Sarah Crespi
Next up, we have a story on inbreeding amongst the first farming families. Ten thousand years ago, humans were making the switch from hunters to farmers, and there may be some odd consequences to that change.

Interviewee – David Grimm
There may be indeed, Sarah. It turns out, or at least according to this new study, that some of these early communities or especially this one community that researchers have studied in a region known as Basta, which is in southern Jordan, it seems that lot of the people that lived in this village were actually breeding with relatives.

Interviewer – Sarah Crespi
One thing I noticed about this was they didn't look at DNA. They looked at bone structure. Why make that choice?

Interviewee – David Grimm
Well, DNA is actually pretty hard to recover, especially from this population. This is a region where you would have very high temperatures. People were burying their dead under the floors of houses or in shallow graves. All these things degrade genetic material, so if you're looking for evidence of inbreeding, you really have to look beyond the DNA. And what the researchers looked at here were skeletal abnormalities, which have been seen in other populations where there is heavy inbreeding.

Interviewer – Sarah Crespi
So what they noticed about this population that linked them all together was missing teeth. How can that be a genetic abnormality?

Interviewee – David Grimm
It's a bit more complicated than missing teeth. The skulls were, indeed, missing teeth. They actually were missing the outer incisors on both sides of their upper jaw. This is actually relates to a rare genetic anomaly known as bilateral maxillary lateral incisor agenesis, or let's just call it MLIA like the researchers do to be a little simpler. This is something that's seen frequently in populations where you have a lot of inbreeding, and it turns out 36% of the skeletons they analyzed had this condition, which is really high. In the general population, there's only an incidence of about 4%.

Interviewer – Sarah Crespi
So they are missing the same kind of teeth. So is this something that Neolithic farmers were forced to do? You know, did they have to just rely on each other to keep their population going?

Interviewee – David Grimm
Well that was one of the ideas. You know, maybe this was a very isolated population and everybody just sort of had to mate with everybody else because that's the only people that were available. But that's actually not what the researchers found. They say this is a population that had nearby populations that they could have mated with, that they traded extensively with other people at the time. So they think it may have been something to do with group solidarity. Perhaps mating with one's own family sort of enforced the solidarity of the village, especially when you had these other villages around. Maybe you want to do something to sort of keep those family ties close. And one way to do that would be to keep people mating with other members of the family rather than having them mate with outsiders. Now that's only a hypothesis. The researchers say they are going to need some sort of DNA evidence to get more proof of that, and that's going to be a challenge.

Interviewer – Sarah Crespi
Finally, we have a story on an amazing property of the naked mole rat. Besides their nudity, naked mole rats have a lot of unique characteristics. For example, they are eusocial, meaning they live in a colony like bees or ants. What other surprises do they have in store for us?

Interviewee – David Grimm
They're also blind, and they're, if I have to say it, pretty ugly. You can actually take a look at one of them on the site, if you dare. They are not the most attractive creatures in the world. But one of the most amazing and unique things about the naked mole rat is actually that they don't get cancer. These are rodents that can live more than 30 years, which is a long time for such a small animal. And researchers have not found a case where they actually naturally get cancer.

Interviewer – Sarah Crespi
So in this study, they have some clues about that, but how do you go about just trying to figure out why something doesn't get cancer?

Interviewee – David Grimm
It's a good question. What the researchers did here was they actually took cells from the mole rats, and they put them in a dish in the lab. And they started noticing some really strange things about them. The first thing was that the cells didn't really clump up or didn't really get that close together, which is something you see with a lot of other animal cells. You put them in a dish. They sort of form these colonies where they all sort of clump up close to each other. They weren't seeing that with the naked mole rats. Also, the contents of the dish got really gooey over time. And when the researchers analyzed the glue, they found that it contained a complex sugar known as hyaluronan.

Interviewer – Sarah Crespi
So what does this sugar do in the animal normally?

Interviewee – David Grimm
Well, this sugar is released into the extracellular matrix – this is the space between cells. And it's not unique to naked mole rats. Humans and mice and rats also produce this sugar. But what's different about the mole rat version is it's about five times the size of the molecules that are seen in those other animals. And the mole rats have an enzyme that breaks down the sugar, but it's not very active in them. It's much more active in some of these other animals. So the researchers think there's something about this sugar that somehow lubricates the spaces between cells. Hyaluronan has actually been used in skin lotions and arthritis treatments, so we already know it has some sort of lubricating properties. And the researchers suspect that the version in mole rats is actually developed over evolutionary time to make their skin more elastic, and that's important for these creatures because they've got to squeeze very tightly into these narrow underground tunnels. But the side effect might be by keeping their cells farther apart, it prevents them from clumping together, which is something that happens when you form tumors, which could explain why these animals don't seem to get cancer.

Interviewer – Sarah Crespi
So they know they have an excess of it, so it might be something that, that is linked to cancer. How do they actually test that relationship?

Interviewee – David Grimm
Well, that hasn't been done yet. One thing they are thinking about doing is actually putting the naked mole rat version of this sugar into mice, which we know get cancer, and we know we can make cancer in mice, and see if it prevents cancer in mice. And if so, you know, there's always the possibility that it could develop into a treatment for humans.

Interviewer – Sarah Crespi

So what else is on the site this week, Dave?

Interviewee – David Grimm
Well Sarah, for *Science*NOW, we've got a story about how that grocery store cabbage is more alive than you think. Also a story about how snail trails are shedding light on ancient human migrations. For *Science*Insider, our policy blog, we've got an item about how NASA is asking for help capturing asteroids. Also a story about which country now has the most powerful supercomputer. Finally for *Science*Live, this week's chat is on the science of superheroes and other Hollywood movies. What does Hollywood get right and wrong when it comes to science? And next week's *Science*Live is about human cloning. What are the pros, the cons, and the controversy? So check out all these stories on the site.

Interviewer – Sarah Crespi
Thanks, Dave.

Interviewee – David Grimm
Thanks, Sarah.

Interviewer – Sarah Crespi
David Grimm is the editor for *Science*'s online daily news site. You can check out the latest stories and the policy blog, *Science*Insider, at news.sciencemag.org, where you can also join a live chat, *Science*Live, on the hottest science topics every Thursday at 3 p.m., U.S. Eastern time.