Science Magazine Podcast

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Promo

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Music

Interviewer – Edward Hurme

Finally today, I'm here with *Science* news editor, David Grimm, who's here to give us a rundown on some of the recent stories from our online daily news site. First up, we have a story on why old people get scammed.

Interviewee – David Grimm

Right, Edward. Well, so this story has to do with the fact that, it turns out about 80% of scam victims are over 65 years old. For some reason, old people are a lot more susceptible to falling for scams than younger people are, and one of the thoughts is that it's maybe because older people tend to put a positive spin on things, so an overgeneralization. But studies have found that older people tend to see things in a positive light. They don't overreact to everyday problems, but that both of these traits might make them less weary and more susceptible to being scammed.

Interviewer – Edward Hurme

So, there's a recent study suggesting that there actually might be something different about the brains of older people making them more susceptible to these scams.

Interviewee – David Grimm

Right. Well there's a region of the brain that's called the anterior insula, and this is a region of our brain that sort of collects information, not about other people but actually about ourselves. It senses our feelings; it includes our gut instinct. So if there's a part of the brain that might turn on in response to, you know, us feeling like maybe something's not right here, it might be the anterior insula. And one of the things this new study sought to find out was whether this region actually did play a role in preventing older people from recognizing this scam.

Interviewer – Edward Hurme

So how did they go about studying this gut feeling phenomenon?

Interviewee – David Grimm

Well, they gathered 119 older adults, age 55 to 84, and 25 younger adults, ages 20 to 42, and they showed them a series of pictures. These are pictures of people that either looked trustworthy or looked neutral or looked untrustworthy. And some of the examples of an untrustworthy look were photos of people that had maybe an insincere smile that didn't reach the eyes, a smug or smirky expression, even a backward tilt of the head. And what

the researchers found was that the older people were significantly more trustworthy. They rated the people in these pictures trustworthy even if they were clearly untrustworthy to the younger group of people. So this sort of confirmed what researchers sort of suspected before that older people seem to be overly trusting. But sort of getting back to the point you raised earlier about what's going on in their brain, what the researchers found was that when they took an MRI of all the subjects brains while they were looking at these pictures, they found that the anterior insula just wasn't lighting up in the older people. It just didn't seem as active, and if we sort of view the anterior insula as a warning bell in the brain, you sort of suggest that the warning bell is not very active in older people.

Interviewer – Edward Hurme
Do we have any advice to give older people on how they should respond to this knowledge that they might be getting scammed more often than other people?

Interviewee – David Grimm
Well, it all depends on what the anterior insula is really doing. It's either the cause of why older people are more trusting, or maybe just a fact of a more positive outlook. Maybe, for example, that older people engage the world in a certain way, and this is reflected in their brain activity. But if that's the case, older people, say the researchers, could work on being more cautious. For example, they could be taught to look out for the facial signs of untrustworthiness and perhaps even prime their brain's warning bell to be a little bit more active.

Interviewer – Edward Hurme
So, moving on from how to detect untrustworthy characters, our next story looks at what a certain species of bird does when it knows it can't trust its neighbors.

Interviewee – David Grimm
Well, that's right, Edward. The species of bird in question here is the Eurasian jay which is actually a very pretty looking bird. It's got pinkish gray feathers and striking blue wing patches. You can see a picture of it on the site. What's interesting about these birds is they are very secretive when they hide their food. They cache food, they stash it behind trees, they bury it, and the reason they do this is because they are competing both with their fellow birds, and also birds of other species for these resources. And over evolutionary time, they sort of learn that if they don't hide their nuts and other food sources, that one of these other birds is going to come in and steal it. One of the big questions in this study is whether the birds actually realize that they are being spied on; that they are being eavesdropped on when they hide these items. And the reason that's important is, that there's something in neuroscience called theory of mind, which is sort of our ability to, sort of, intuit what other people are thinking, so it's not just sort of thinking about ourselves and being very instinctual. If you know if somebody looks at us in a funny way or does something to us, if somebody sort of raises their hand to us, do we intuit that they are going to slap us or they are going to shake our hand? All of these things sort of suggest thinking about what another person is thinking. It's actually a very complex skill. It's only been seen in a few animals. Typically, what we consider the

more intelligent animals like chimpanzees and monkeys, even dogs, have been shown to have theory of mind in some studies. So the question in this study was, do birds have it as well, or at least do these Eurasian jays have it?

Interviewer – Edward Hurme
So how did the researchers test to see what was influencing the birds' behaviors?

Interviewee – David Grimm
Well, what they did is they gave these birds 30 peanuts, and they also gave them two different trays. One tray contained soft sand they could bury the peanuts in, and the other ones contained gravel which was noisier. And in some of the tests, the jays tried to bury their booty while a competitor watched or listened. In another test, the birds' competitor was within ear shot, but the bird couldn't see what the competitor was doing. And what the researchers found was overall, the jays preferred the quiet sand for stashing their nuts - which really isn't that surprising if you think you've got a competitor out there you don't want them to know, you know, where you're burying your food. But they also found that some birds that were using the gravel, what they call the noisier substrate, when they realized that a rival was watching and listening, they changed their behavior, and they started using the softer sand instead. They also changed the amount of noise they made. These birds tend to be pretty noisy birds, but when they felt that somebody was eavesdropping on them, they made a lot fewer vocalizations and a lot softer vocalizations than they do normally.

Interviewer – Edward Hurme
So the stashing bird changes its behavior, but does the robber also change its behavior in this arms race for stealing food?

Interviewee – David Grimm
Right. Well the robbers were really quiet as well, suggesting that they knew that if they were noisy, the stashing bird might pick up on it. Now all of this may seem like very intuitive behavior, but again, what it shows is that these birds are very, sort of, aware of the mental states of other birds. They are thinking about does this other bird hear me. If this other bird hears me, then this other bird may hide its food somewhere else. And the bird that's hiding the food says, you know, I think I'm being spied on. If somebody is spying on me and they hear what I'm doing or they see what I'm doing, they are going to get my food. So even though they sort of seem like basic responses to us, they are evidence of potentially complex cognition in these animals.

Interviewer – Edward Hurme
And finally from eavesdropping animals, our next story looks at how satellites can eavesdrop on nuclear tests even when they are underground.

Interviewee – David Grimm
Well, Edward, this study has to do with a Comprehensive Nuclear-Test-Ban Treaty, and this is a treaty that's been signed by a number of nations. And the idea is, ever since about 1992, these nations have agreed not to detonate nuclear weapons. But the question

is, how do you catch the cheaters? And we have some ways to catch cheaters right now. You can use seismic networks that listen for shock waves caused by underground explosions. You can use hydroacoustic networks that scan the oceans for sound waves in case somebody detonates in the ocean, and even radionuclide network to sniff out radioactive particles that the nuclear explosions produce. But now our team has suggested an addition method, and this method involves looking up at the sky, specifically into the ionosphere, which is the portion of the upper atmosphere that is ionized by solar radiation.

Interviewer – Edward Hurme
So what actually happens to the ionosphere when a nuclear blast goes off?

Interviewee – David Grimm
Well, when a nuclear blast happens, even if it happens underground, it sends up this giant electromagnetic pulse that ripples through the ionosphere, and it causes an effect known as the traveling ionospheric disturbance or TID. What the researchers in this new study want to find out was; is there a way to detect this TID using technology we already have – things like global satellite networks and radio telescopes.

Interviewer – Edward Hurme
So are nuclear blasts the only thing that might cause a ionic disturbance?

Interviewee – David Grimm
No, that's a really good question. Earthquakes and major storms can also cause it. So one of the big challenges for the study was to figure out can researchers identify these TIDs, and can they distinguish the TIDs caused by nuclear explosions versus events caused by things like earthquakes and major storms. And actually, they found that they could. They looked at a couple of tests that had been done in 1991 and 1992 northwest of Las Vegas. They used global satellite networks and radio telescopes, and what they found was there was a lot of noise but if they really sort of honed in on things, they came up with a profile for TIDs that was very highly suggestive of a nuclear blast. And what they say is by using this profile going forward, researchers would be able to use all this extant technology gives them – yet another way to scan for nations that are detonating nuclear bombs.

Interviewer – Edward Hurme
So, David, what else have we got on the site this week?

Interviewee – David Grimm
Well, Edward, for *Science*NOW, we've got a new method for analyzing the health of rainforests. Also, new insights into how maggots heal wounds and stop inflammation. For *Science*Insider, our policy blog, we've got a story about NASA's plans to land humans on an asteroid by 2025. Also, controversy over the latest edition of the DSM. This is this psychiatric manual that comes out every few years. Finally for *Science*Live, our weekly chat on the hottest topics in science, this week *Science*Live is about whether science can conquer the flu. And next week's *Science*Live, which will be our last

*Science*Live of the year, is about male contraception. How close are we to the pill for men? So be sure to check out all these stories on the site.

Interviewer – Edward Hurme
Great, David. Thanks for talking with me. David Grimm is the news editor for *Science*. You can check out all our news at news.sciencemag.org including daily stories from *Science*NOW and science policy from *Science*Insider. While you're there, be sure to check out *Science*Live – a live chat on the hottest science topics every Thursday at 3 p.m. U.S. Eastern time.