The Science of Fear: Science Buzz Session – Part 1

SR: I’m Sandeep Ravindran, and welcome again to Science Sessions. This week we’re featuring the first of two podcast recordings from “The Science of Fear!”—a lively discussion with psychology experts Daniel Pine and Mark Wiederhold held in Washington, DC on October 12, 2011. The event was part of our regular Science Buzz series, and was hosted by PNAS and the Koshland Science Museum.

In part 1 Daniel Pine and Mark Wiederhold introduce their research on the science of fear. Why are some of us more prone than others to phobias? How do we learn to dread certain things, and how do these fears change as we age? PNAS media coordinator Sola Ayeni-Biu, who moderated the session, starts us off.

SA: The first researcher we’re going to introduce tonight is Dr. Daniel Pine, and he’s a researcher at the National Institute of Mental Health. His most recent work uses methods from neuroscience to study normal and abnormal emotional development.

DP: So when I began my work in the 1980s, we began a number of studies that were looking at young children with various kinds of fears, and we followed those children over the past 25 years, and what we have discovered is that anxiety is incredibly common in children. It usually goes away—most children with anxiety, even severe anxiety, recover from it. But when we look at adults, when we look at a population of adults who have a chronic problem with either fear or emotional problems like depression, what we find is that most of those adults would have had their problems start when they were children. So what that’s really emphasized to us, is to try to understand better what is it that sets apart children who have transient problems with anxiety on the one hand, versus children who will have persistent problems. And the hope is, that by using things like brain imaging and neuroscience, we’re gonna do better at that. I think that there’s two things that we really want to use neuroscience for: one thing that we want to use neuroscience for in terms of thinking about anxiety, is get a better handle on individual differences. Can we diagnose people using neuroscience? Can we predict who’s really at risk? We’re very very far away from doing that. However, already there have been a number of novel treatments that have emerged based on our understanding of how the brain works and how it goes awry in fears that become pathological.

SA: Now we have Dr. Mark Wiederhold, and he’s the President of the Virtual Reality Medical Center in San Diego, and they do 3-dimensional computer simulation in combination with physiological monitoring to treat panic and anxiety disorders.

MW: At the VR medical center we’ve been using virtual reality to treat patients for about the past 15 years. It’s similar to a videogame but it’s different. Before we put the people in the virtual environments we give them skill-based training and we teach them to recognize when they get anxious, when their heart-rate goes up, when their breathing is erratic, we give them skills to control that. A lot of fear and anxiety has to do with you feel like you have a loss of control. One of our patients we treated with a fear of flying,
we put him in a virtual airplane and we make him think the plane’s going to crash, and they learn to live through it and then they’re fearless. One of the patients came back three months later and said, ‘you know, with the skills that you taught me I was able to cure my own fear of heights.’ And that’s what this is all about. We want to put you in control, we want to put you back in charge. Now let’s take a look at a little bit more significant problem, and that is treating Post Traumatic Stress Disorder (PTSD) in folks coming back from Iraq and Afghanistan. You probably don’t get to the virtual environments until session three or four, it will trigger PTSD in a lot of folks. It seems a little counter-productive to give them exposure to the things that cause PTSD, but that’s exactly what exposure therapy does. We start with a very low level of stress, and gradually going to more and more chaos, more noise, more claustrophobia, and so this way when they can habituate to these environments in the clinic, they’re then able to go out in the real world and have a more normal function.

SA: I’ll kick it off with the first question. You mentioned that children with transient and persistent fears are sort of set apart. How do you tell the differences? Are there are signs? Could you speak a little more about that.

DP: So the way we get over our fears is being able to be exposed to the things that we’re afraid of, and one of the biggest determinants is the degree to which a child can tolerate exposure. So kids who are very avoidant of the things that they’re afraid of, those are the kids that we worry about most

SR: Thank you for listening to PNAS Science Sessions. Tune in three weeks from today for the second Science of Fear podcast, where Daniel Pine and Mark Wiederhold continue to answer questions from the audience, including how adult fears develop and how they can be treated