



Science Magazine Podcast Transcript, 15 February 2009

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Music

Host – Robert Frederick

Hello and welcome to this special *Science* Podcast from the 2009 AAAS annual meeting in Chicago, Illinois. It's February 15th. I'm Robert Frederick. The theme of this year's meeting is the origins and futures of life on our planet, and in this short podcast we'll hear about the origins of emotions, the evolution of human behavior, and how putting your feelings into words can dampen those feelings.

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Host – Robert Frederick

In his 1872 book, *The Expression of Emotion in Man and Animals*, Charles Darwin argued that certain emotions are found in all societies and are biological in origin. Paul Ekman is a psychologist who edited the third edition of Darwin's book, published in 1998, and also studies facial expressions and has written many books and articles on the topic.

Speaker – Paul Ekman

It's hard to know exactly why he got interested in the expression of emotion. Certainly on the voyage of the *Beagle* and the notes he kept on that he was impressed that in many countries he could not understand their words or their gestures. But he had no trouble with their facial expressions. That fascinated him. And in the 1872 book, which has never gone out of print in any language, Darwin really argued that emotions are discrete, they are universal, that is, common to the species, and he was very concerned in showing the unity of mankind. He was explicitly anti-racist in his views, and he saw this book as an important contribution showing the commonality of all people and a common descent. And the last important issue, a very unpopular one still today, is that we share these emotions with the animals that we eat and many other animals. He talked about everything from bees to horses to dogs to cats as having emotions. And some of them – the primates – having many of the same emotions. His forecasts have turned out to be very correct in almost all regards. He didn't have very strong evidence. I gathered some of that that supported him.

Host – Robert Frederick

Barbara King's work also supports Darwin's view of the biological origin of certain emotions, but she notes certain emotions can be expressed in different ways by different animals, even similar animals like chimpanzees. King is an anthropologist at the College of William and Mary.

Speaker – Barbara King

One thing that we have to be very careful about in studying non-human primate emotion is to avoid anthropomorphism. So, for example, if you look at a chimpanzee, a very naïve observer might see what appears to be a big smile and think that you're looking at a really content chimpanzee when in fact he's giving a "fear grin." And you have to know the particular species. What I try to do in my work is suggest that – I describe muscle-toned facial expression in context – and then give an interpretation that suggests the emotional meaning, so that I don't make direct correlation between humans and non-human primates. So it is important to do that species by species.

Speaker – Paul Ekman

A group of primatologists and anthropologists, psychologists in England...

Host – Robert Frederick

Again, Paul Ekman.

Speaker – Paul Ekman

... have come up with what they call "chimpanzee facial action coding system," which is the chimpanzee version of the thing I published 30 years ago in '78 for measuring humans. So it is for the first time possible to do muscle-by-muscle direct comparisons between chimps and humans. And some of that work is already reaching publication.

Speaker – Barbara King

I know that work, which is really fascinating work. Lisa Parr, also, and others...

Host – Robert Frederick

Again, Barbara King, from the College of William and Mary.

Speaker – Barbara King

... and I think that what I'm trying to suggest is that a complementary focus is needed by looking at spontaneous, in-the-moment expression of emotions. And that you can't get the full picture unless you do look at what's happening in terms of exactly the mother-infant component. And I work with developmental-dynamics scientists who suggest that the meaning of what you see actually can only come to its fullest flowering in that social encounter.

Host – Robert Frederick

Because, King argues, we wouldn't be human in the way we are human today if the ancient apes hadn't been both deeply social and deeply emotional creatures,.

Speaker – Barbara King

We are, in part, products of our past. And I mean this not so much in terms of genes or innate brain modules or even innate emotions. Apes, through my work I've been able to show, develop the fullest expression of their emotions in social relationships. I'm speaking here of our closest living relatives – the chimpanzees, gorillas, and orangutans. And they develop emotions as their events unfold with their social partners. And to me this is evolutionarily significant and how my work is a little bit different. You can see

that this relates very directly to what Dr. Ekman said about some of Darwin's insights in terms of common descent and shared emotions. Apes show grief, and apes show empathy. A lot of zoos around the world, including Brookfield here, have begun when an ape dies to allow companions to file past their body or sit with the body, because of this recognition of ape emotion. But my work focuses more on mundane events of everyday life: the way that we know our infants and juveniles in our homes show emotion at breakfast, at bath time, at the playground. I look at what apes do in their everyday lives. These events that are emotional are robust across species, and they're robust across captivity, in the wild. So I'm suggesting that what we see in terms of emotional expression in the apes is an indication of what happened in our evolutionary past. That was a platform for the human lineage to evolve different behaviors. For example, our human language is very emotional in the way we co-create meaning. And I've also argued recently in a book that our religion is emotional at its root because we are all about belongingness, including belonging with the supernatural.

Host – Robert Frederick

While our human language may be very emotional, the actual putting of those emotions into words dampens our feelings, according to Matthew Lieberman.

Speaker – Matthew Lieberman

Whether it is through therapy, writing in diaries and journals, or bad poetry...

Host – Robert Frederick

Lieberman is a psychologist who co-directs the Social-Cognitive Neuroscience Laboratory at the University of California, Los Angeles.

Speaker – Matthew Lieberman

...and our hypothesis has been that this is actually a sort of unintentional form of emotion regulation. And the way we've approached this is by looking to the brain, because if you ask people, most people don't actually think that just putting their feelings into words serves much of an emotion regulatory function. We have data on that as well. But when you look at the brain, it looks a whole lot like emotion regulation is going on when people put feelings into words. So we've looked at this with fMRI, with physiological measures, and with some experiential tests as well. And we see this pattern again and again. And, in essence, what it boils down to is that there is a region of the brain, sort of right next to the right temple, called right ventrolateral prefrontal cortex, and this region seems to be involved in all different forms, or various different forms of self-control and self-regulation. And it appears that if you get this region activated, even when you're not trying to regulate, it still has regulatory consequences. Putting feelings into words is one of the things that turns on this region and therefore has these kinds of regulatory benefits. And so that's kind of the major focus of what we've been trying to do with this particular line of research.

Host – Robert Frederick

And, Lieberman says, the more activity in that right ventrolateral prefrontal cortex in your brain, near your right temple, the less active is the amygdala, which is involved in a wide range of emotional and behavioral functions.

Speaker – Matthew Lieberman

And there seems to be sort of a seesaw effect: the more of the prefrontal activation you see, the less of the amygdala response that you'll see.

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Host – Robert Frederick

This has been a special *Science* Podcast from the 2009 AAAS annual meeting in Chicago, Illinois. If you would, please take a moment and give us your input. Write us at sciencepodcast@aaas.org or please fill out our online anonymous survey at www.sciencemag.org/multimedia. This show is a production of *Science* and of AAAS – the Science Society. Jeffrey Cook composed the music, and I'm Robert Frederick. On behalf of *Science* magazine and its publisher, the American Association for the Advancement of Science, thanks for joining us.

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