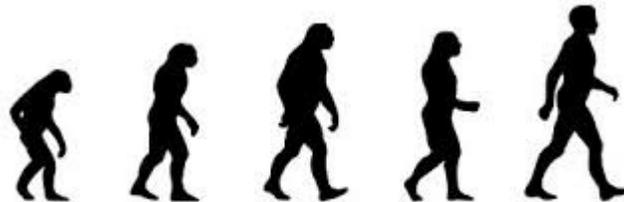


THE LEAKEY FOUNDATION Origin Stories Episode 08 Being Human with Robert Sapolsky



THE LEAKEY FOUNDATION

Origin Stories Episode 08: Being Human with Robert Sapolsky

***Meredith Johnson***

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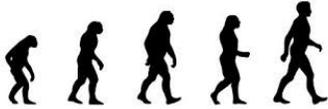
This is Origin Stories, the Leaky Foundation podcast. I am Meredith Johnson.

We have a special episode for you today and it is sort of an experiment, so we would love your feedback. I will tell you how to get in touch at the end of the episode. In October, as a part of the Bay Area Science Festival, The Leakey Foundation and The Bauman Foundation hosted a live event called Being Human. Our speaker was Robert Sapolsky. Sapolsky is a renowned Professor of Biology and Neurology at Stanford University. Over the past thirty years, he has divided his time between the lab, where he studies, how stress hormones can damage the brain, and in East Africa, where he studies the impact of chronic stress on the health of baboons. He is the author of several bestselling books, including *A Primate's Memoir* and *Why Zebras Don't Get Ulcers*. Here's Robert Sapolsky, live on stage at Public Works in San Francisco.

***Robert Sapolsky***

Okay. I have had sort of a dual career over the years, half a neurobiologist, half a primatologist. I spend about half my time living in a lab and mocking around with neurons and sticking genes in them and such and then about half my time studying baboons in a national park in East Africa. And if you spend enough time sort of going back and forth between the two, eventually you begin to look at humans

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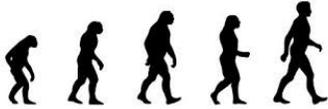


fairly strangely. They really do take on a different quality. I mean you obviously wonder about everybody's neurotransmitter levels, but you look at other guys and you wonder if their canines are longer than yours and you usually conclude that they are or you spend a lot of time looking at people's rear-ends and calculating how much anesthetic you would need to dart them. But what I thought I would talk about tonight is if you spend time studying the brain-basis of behavior, the evolutionary basis, after a while, it is really a challenge. There's ultimately this question of thinking about humans: Are we just another primate? Are we just a collection of neurons? Where to place us in the biological world?

So I thought I would sort of give somewhat of an overview of where we fit in. And the answer is we keep being just like every other species out there, until you look a little bit closer. What we will see here is, as I present this material, there are sort of three basic challenges. And the first one is recognizing the domains in which there is nothing fancy about us whatsoever. We are just like every other species out there. Some of the time, the challenge is the second one, which is we have got the same basic wiring as everybody else out there, but we humans use it in a way that is utterly bizarre. And then, of course, the third domain, where we do stuff that is simply unprecedented.

Let me give you an example of each. First one: you are a hamster. You are a female hamster and what you do as a female hamster is about every five days or so you ovulate. That is what you do, unless some researcher has stuck a second female hamster in the cage with you. In which case, both of you lengthen your cycles and you begin to synchronize them, so that after about three weeks or so, you both ovulate the same exact afternoon. Totally amazing! This is all done with olfaction pheromones. You can show that if you hold up hamster's nose shut for three weeks, she does not synchronize to the female stuck in her cage. But two female hamsters together and their cycles will synchronize. Unless you now take a male hamster and put him into the middle of the cage. In which case their cycles desynchronize completely. It is all olfactory. You can prove this totally. Do not put the male in the cage. Take the male in another cage and pump the air from his cage into their cage and that desynchronizes their cycles. It is all olfactory. And the coolest thing of all is, when you put the two females together, it is not random who synchronizes who. The socially dominant one tends to synchronize the other. So, this is just like standard knowledge. People have known this forever. And it works this way in dogs and cows and pigs.

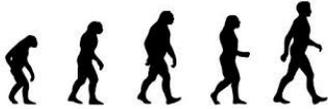
Apparently, you could go to a Seven-Eleven in Iowa and buy a can of pig ovulatory synchronization spray and you can go home—I have no idea why you would want to do this—but you can go home and spray it all over your pigs and all of them will synchronize their ovulation. You can do that. People do



that. People are licensed to do it. This is so well-understood, that it is like commercial spinoffs. And the most amazing thing about it of all is it works exactly the same way in us, where it's known as the Wellesley Effect, named after Wellesley College—all women's college—paper from 1970 showing how during freshmen year, roommates would tend to synchronize their cycles with each other. It was an olfactory phenomenon. They would synchronize their cycles, unless one of them was having close intimate relations with a male, which would desynchronize the cycles. It's the same pheromonal communication. It all works the same. And most cool of all is it is not random who synchronizes who. It tends to be the women who are more socially extraverted, dominant. Now, this is well enough understood that when I was in college, people would sit around at their dinner table and say, "When we roomed together in the summer, I had her synchronized by August 1. You know, that is kind of what biologists do. So, in a setting like that, what the challenge is, is accepting we are just like every other species out there.

Now, some of the time, the challenge is in the second domain. And what you see there is that—well, let me give you an example: a human ritual. Two humans sit at a table. They are silent. They do not move. They do not make eye contact. They do nothing more physically taxing than every now and then one of them lifts an arm and moves a piece of wood on the table. And if these are two chess grandmasters in the middle of a tournament, they are maintaining the blood pressure for hours of marathon runners and they are doing it just with thought. And that is the amazing thing with us. We sit around and we activate the same physiological systems. I mean you sit there and you get stressed over something psychological and you are secreting the same hormones that fish and reptiles and birds do when they are stressed. And what are we doing? We are thinking about ozone layers or something completely abstract. We turn on the same stress response. With us, we have the same old physiological wiring as every other mammal out there and then we use it for utterly bizarre circumstances, as we will see.

Finally, third domain. There are circumstances of human behavior where there is simply no animal precedent. Now, let me give you an example here—shocking example. You have a couple; they come home from work at the end of the day; they talk; they have dinner; they talk; they go to bed; they have sex; they talk; they fall asleep. The next day, they do the same exact thing. They come home from work; they talk; they eat; they talk; they go to bed; they have sex; they talk; they fall asleep. They do the same thing every night for 30 days in a row. Hippos would be repulsed by this. Hardly any other species have non-reproductive sex and nobody else talks about it afterward. And at that regard, we are

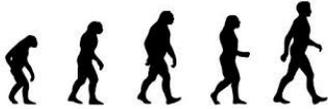


totally unprecedented. In those domains, if you want to make sense of us as a species, there is simply no animal equivalent.

So, as we see these various topics here, that is going to be our challenge is recognizing which categories we are falling in. Now, what I will be doing is going through a whole bunch of domains and showing all the areas in which there used to be things that were just unique to humans and it is not so unique anymore, until you look closer. Starting off with aggression. Every National Geographic special used to sort of finish off about how we are the only species that kills members of our own kind. We are the only species that commits murder. We are not the only species that kills. All sorts of other animals out there kill members of their own kind; they kill infants strategically. They kill with Machiavellian strategic intelligence; we have all sorts of cases of that. Chimpanzees have now been observed to fashion something resembling weapons out of sticks to use to hit each other. We are not the only species that will kill each other. We are not the only species that will do it in a constant, permeating kind of way.

Now, this is a baboon who adjoined one of my troops a few weeks before and the only way to describe this guy is he had horrible political skills. He was just hassling guys he had no business going anywhere near. One evening, coalition of six males gang up on him and this is what was left in the morning. And in my thirty years of studying baboons, the leading cause of death among male baboons are male baboons. We are not the only species that kills. We are not the only species that kills in an organized way. These are chimpanzees carrying out what is called a “border patrol.” They are all from the same group. They have gotten in a very agitated state and they are off patrolling the border of their territory. And if they encounter a male from the neighboring group, they will kill him. This is planned, organized violence and has been documented a number of times now. The males of one group of chimps have eradicated every single male member of the neighboring group and expanded their territory. This is virtually the definition, by UN standards, of genocide: killing somebody not for who they are, but simply for what group they belong to. We are not the only species that does that.

We are not the only species that is capable of deep unconscious aggressive bias against them (sic). Fascinating example of this: if you ever want to take a totally terrifying test, take something called “The Implicit Association Test”. It is this brilliant psychological test that reveals every unspoken prejudice and bias that you have going for you, because it is impossible to fool this test. Here is how the test works. Suppose you have a horrible, ugly, vicious prejudice against trolls. You just have something in for trolls and you think they are simply inferior to humans. So, you are given this task computer screen where up flash a bunch of pictures of either humans or trolls and you are instructed,

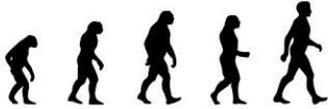


“If it is a human, press this button on the right. If it is a troll, press this button on the left.” Or a series of words with either very positive or negative connotations, “If it is positive press this button; negative, press.” And then it comes in a combination. You have to see, “If it is a troll on the right or this kind of word, press this button; if it is a human on the left.” And what you see is, when the category of human and troll fits with the word, it is an easy association. Flash up a human with the word “trustworthy” and that makes perfect sense. Flash up malodorous with troll, that makes perfect sense. Your reaction time for hitting the correct button is very short. But now, switch it around the other way and for a minuscule amount of time, you pause and say, “Wait a second. Trolls are not kindhearted. That is right, hit this button.” “Wait a second. Humans are not bad, hit this button.” There is a minuscule-on-the-scale-of-milliseconds delay. And you do enough of these and you can tell if somebody gets a delay coming in there—the scale of like a tenth-of-a-second delay—they are feeling the cognitive dissonance, “I do not associate these positive values with this group.” It is incredible.

Then, recently a group—a Yale group—showed the exact same thing in rhesus monkeys. They took either pictures of monkeys from the same group as the individual they were testing—the male on the left—or someone from the next group over—a them—a very menacing them. So, either flashing up pictures of somebody of their own group or someone from the out-group; or flashing up pictures of wonderful positive things for monkeys, like tropical fruit, or negative things—spiders. And then you gave them the task that they would have to process pairs and you would see the exact same thing. When you would have discordant categories, it took slightly longer. The monkey was sitting there saying, “Wait a second. We are the ones that make me think of luscious tropical fruit and they’re like yucky spiders; not the other way around.” Other species can even think in terms of categories of prejudice.

So, in what ways are we special when it comes to aggression? We are just like any other primate, in terms of our capacity to cudgel somebody over the head to death. We are perfectly capable of doing that, but we could be violent in all sorts of ways. We can exert no more effort than it takes to pull a trigger or release a bomb from thirty thousand feet or operate a drone on the other side of the planet. We can be aggressive by looking the other way and pretending we do not see or damning with faint praise or this concept utterly foreign to any other primate—we can be passive-aggressive. We can do it in all sorts of ways.

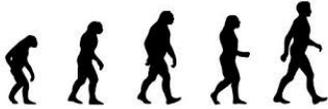
Let me show you just how bizarre human violence can be. In the mid-1960s, there was a coup in Indonesia that overthrew the government there and instituted a rightwing dictatorship for the next 30



years that came to be known as The New Order. And in the aftermath of this coup, every vendetta, every bit of revenge was carried out against every ethnic minority group; against every sort of left-leaning group out there. Death squads killed an estimated half a million people in Indonesia over the subsequent years. Entire villages of people would be burned to death in their huts, when death squads would come.

So the writer [V.S. Naipaul](#) was traveling through Indonesia some decades afterward and was learning about the history of this whole period—the troubles during that time—and he kept hearing this story. Which was sometimes when these death squads would come to destroy a village, they would bring along a traditional Indonesian Gamelan orchestra. What the hell is with that? Totally bizarre. He kept hearing rumors about it. And one day, he encountered some grizzled old veteran of one of these death squads—unrepentant because he had just spent thirty years as a national hero— and Naipaul said, “I heard this rumor. Is this true?” And the guy said, “Oh, yes, yes. Whenever we would go to kill everyone in the village, we would bring along a Gamelan orchestra. It was great. We would bring along the flutists and the drummers, and the singers and all of that.” And Naipaul said, “Why would you do that?” And the man looked at him, puzzled, and said, “To make it more beautiful, of course.” There is no other primate out there that could begin to make sense of the ways in which we damage each other, if we can do something like that.

A next domain: theory of mind—tremendously trendy subject—theory of mind and developmental psychology. When do kids first understand that other people have different information than they do? Typically, this occurs between ages three to five or so. My kids achieved theory of mind in the morning of their third birthdays. This is this big developmental landmark. It is thought to be a stepping stone. Other individuals have different thoughts than you do; precursor for they have other emotions than you do; the starts of empathy; all of that—major, major developmental milestone and sort of human development. But then it turns out, we are not the only species that could do theory of mind. And this is some research where chimps—captive chimps—would look at a human—a human would be in front of them and some food would be hidden in the room. They could not see where it was hidden, but the human was oriented to be able to see. Half the time, though, the human had a bucket over their head; half the time they could see. The chimp was then let out and the question was: Would the chimp go over to the human to try to get the human to lead them to where the food was? And chimps could do theory of mind. They understood if the human had their eyes covered when the food was being hidden, the human does not know where the food is, so do not bother trying to get them to show you. They

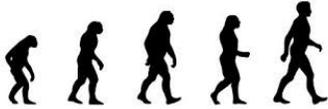


understood under what circumstances a human would have information that they did not. We are not the only species that does theory of mind.

What we are, though, is the only species that does what is called “secondary theory of mind.” Being able to understand that this person has information that that person does not have and to be able to understand their interactions that way. It is for this reason no chimp could possibly know what in hell is going on in *Midsummer Night’s Dream* and follow the plot of this person is in love with that person, but thinks that they are in love with that one, because they cannot do secondary theory of mind. They would not put up with the performance of it.

Another domain: the defining feature of our humanness—the golden rule—do unto to others. Every society has some version of that or the negative version—do not do unto others as you would not have them do to you. This is just universal. This is the building blocks of human morality, sense of justice. All sorts of work has been on seeing this—how you build whole moral systems out of reciprocity; this whole area of research called “game theory.” And game theorists have spent decades advising diplomats and war strategists and economists in all these sorts of game situations: When do you cooperate; when do you not; what are the strategic advantages of each approach? So, if you study game theory—the posterchild—the fruit fly of research in that area is a game called “The Prisoner’s Dilemma.” Prisoner’s Dilemma: two people play it and they have some juncture where they have to decide do they cooperate with each other or do they defect. And the outcome is: if you both cooperate, you both get a reward; if you both defect—if you both stab each other in the back—you both get punished. But if one of you cooperates and the other stabs him in the back, the cooperator gets screwed, loses a huge number of points, and the individual who got away with stabbing the other in the back gets the biggest reward of all. So, the game theory question becomes: When do you cooperate and when not?

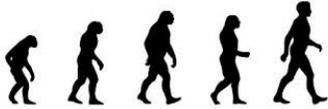
And in this famous study in the 1970s, this economist named Robert Axelrod—what he did was he went to all his friends and explained how the Prisoner’s Dilemma worked and said, “So what would be your game strategy?” He went to theologians and prizefighters and Nobel Peace Prize winners and all of that. He took everybody’s strategies, programmed them and put them in a gigantic computer and ran hundreds of thousands of generations of round-robin tournaments against each other. And one strategy kept winning and it was the simplest one in there. It was a tit-for-tat strategy. You start off by cooperating. If the other player cooperates, you keep cooperating. If they stab you in the back one round, you stab them in the back the next round. If they have gone back to cooperating, then you go



back to cooperating. Totally simple and the words that they used were not just sort of random, but they are very much thinking about the meaning here. Tit-for-tat drove all the other strategies into extinction. It was the most optimal strategy.

So, this was wonderful. The game theorists, economists, everyone is delighted. The animal behaviorists take one look at this and say, “Whoa! All sorts of social species cooperate. Do they use the same rule? Have they evolved this optimal strategy?” And people went to look to see if their animals did tit-for-tat. And yes. First example: vampire bats—vampire bats, my God, drinking blood from other animals. When a vampire bat is drinking blood, all she is doing is getting food to feed her babies. Because she is not actually drinking it, she is storing the blood in her throat sack, and she flies back to her nest and disgorges the blood to feed her babies. Now, vampire bats have an interesting social system. In that a whole bunch of females will have communal nests and they feed each other’s babies. They have a system of sustained reciprocity of helping each other out with feeding. Now, make the bats in this colony think that one of the females is cheating. She flies out of the colony, catch her in a net, get a hold of her and pump up her throat sack with air and push her back into the colony then. Everybody is looking at her saying, “Oh my God! Look at the size of her throat sack! She has got so much blood and she is not feeding my baby!” And the next round, nobody feeds her babies.

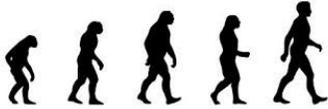
Another example of tit-for-tatting. And this was with a group that—like vampire bats, they are mammals, but they are not all that bright. Look at this in comparison. This is with fish, stickleback fish. So, you have a fish in the tank. Make the guy think his territory is being invaded by another fish. Put a mirror up against the side of the tank. And you know what is happening. Within two seconds he is lunging at it and doing territorial displace. Now, make him think he has a coalitional partner. Put a second mirror in there, perpendicular to the first. So now, he is in there, lunging at his image, and he is saying, “This is great. I have no idea who that guy is, but whoa! We are such a coordinated team! It is so great. Because there is another guy invading also. That is great. What a team. All the way! Momentum!” Now, make him think his partner is cheating on their social contract. Angle the mirror backward, so that the image is deflected backward. And now, he is lunging at his image and he is thinking, “That son of a bitch! Here I am, I am blistering my lips on this glass here. Oh, he is going forward, but I see he is hanging back. He is just pretending to go forward.” And the next time he is presented with his image, he does not attack it. He tit-for-tats back. We are not the only species that has evolved this optimal strategy of cooperation.



So, what is unique about us? We are the only species that can do reciprocity, where we have a currency that is not the same from one individual to the next. Other animals can do unto others as they would have do unto you. We are the only species that incorporates the fact that we have different desires and different reinforcers. There is no other species that could look at this and understand what is going on here. We have a much more complex world of reciprocity.

Another domain: empathy. Empathy. It defines us like nothing else out there. We are wondrously empathic. We help individuals in all sorts of settings. We are not the only species with the sense of empathy. Wonderful work by [Frans De Waal](#) at Emory University, looking at chimpanzees. Here is what he would observe—two different scenarios. First one: some chimp challenges a high-ranking guy and gets trounced by him. Second scenario: some chimp is sitting there minding his own business and high-ranking guy is in a bad mood, and trounces him. In other words, in the first case, the guy asked for it. He initiated this. He provoked it. In the second case, we have an innocent bystander, who is a victim of displacement aggression. And what De Waal shows is in the hour after these events, the other members of the group are far, far more likely to groom the guy who was the innocent bystander than the guy who started the fight. First off, that is showing they can understand intentionality. He asked for getting pummeled there. This guy did not. And they can extend pro-social behavior much more in that direction. We are not the only species who is capable of responding emphatically to an underdog who is getting a lousy deal.

So, what is special about empathy in humans? Our thing is we could extend it over space and time in incredibly abstract ways. Consider this for example: So, here we have a picture of this dog, whose paw was caught in this trap. Its paw became necrotic, came off. This is horrifying. Looking at your faces right now, a number of you are doing something that is unprecedented. You are feeling the pain of a member of another species. There is hardly any other organism that can do that. You were feeling the pain of this dog. But we could make it even more abstract than that. This was the German expressionist painter [Franz Marc](#), yet another one of the painters sort of destroyed during the trench warfare of World War I. This was a painting he produced around that time—sheer chaos going on, where we see amid some encapsulation of warfare—whatever in the center—there's this animal baying at the moon. This animal absolutely terrified and this is not a real animal. It is no known species; it is purple; it is nothing that actually exists. It is some sort of generic animal. The name of the painting: *The Fate of the Animals*. When we look at his painting, we do not feel badly for that animal; we feel badly for the animals. But we could take it one step further. We could look at this and say, “Oh no! Hometree—it has destroyed the poor Na’vi and Avatar.” They are not real. They are pixels. They are CGI. Yes, we can sit

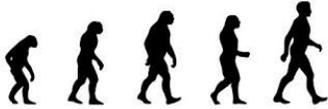


there and we can feel deep empathy for a character in a novel. We can do stuff with empathy, like no other species out there; the ways we can extend it; the ways we can abstract it.

How about another domain of human behavior? And here we have the human capacity for gratification postponement. It turns out there is this one neurotransmitter that is very central to gratification—this neurotransmitter called dopamine. Dopamine is about reward. Cocaine works on dopamine synapses. Dopamine is about reward. For example, you take a monkey and it's in some setting and from out of nowhere you give it something wonderful. You give it a grape or something and it secretes dopamine in these reward pathways. Dopamine is about reward. Dopamine is not about reward. Here is what you do now. You train the monkey in this paradigm. A signal comes on—a light comes on and what the light means is we have started one of those sessions, where if you now work by pressing a lever ten times, you will get a reward. Signal; we've started one of those sessions; do the work; you get a reward. When does dopamine get released? Not when the monkey gets the reward; when the signal comes on. That is the monkey sitting there saying, "I'm on top of this. Piece of cake. I know how to do this. This is going to be fabulous." Dopamine is not about reward. It is about the anticipation of reward. Even more so, if you block the dopamine release, the monkey does not press the lever. It is not just about the anticipation. It is about the work you are willing to do to get it—the goal-directed behavior.

Brilliant follow-up study. This was a group at Cambridge, a man named Wolfram Schultz—where what they did was the following now. What you just saw was the scenario of, "Press the lever ten times, you get a reward. Do the work, you get a reward, absolutely guaranteed." Switch things to: you get the reward only about fifty percent of the time. What happens to dopamine? It goes through the roof like crazy, because you have just introduced the critical word into your biochemical pathways. You've introduced the word "maybe" and there is nothing as addictive as the word "maybe" for generating work. Goal-directed behavior is just driven—and you look at this and this is the exact same neurochemistry that is understood by engineers who designed Las Vegas. The word "maybe"—that fulcrum of, "I'm a total shmuck. It never works out. But today, I'm feeling lucky. But no, it is not going to—but maybe today." And you're just tethering on that fulcrum and you press the lever over and over and over, because you have dopamine coming out of your ears.

So, what is unique about us in that regard? All these studies here, all that time course there on that X-axis is over the matter of half a minute or so. What do we do as humans? We can have a lag time between the signal and the work and the reward that lasts forever. We all know this. We studied hard in school to get a good grade; to get into a good college; to get into a good grad school; to get a good job;

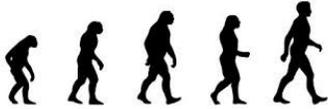


to get into a good nursing home. We all do this. Look at this. Humans can even do it where they will lever-press like mad for a reward that does not even come until after you are dead. If you have the right theology, if you have that framework, there is nothing out there in the animal world and their use of dopamine that begins to approach our capacity to do this, just how long we are willing to do goal-directed behavior before we get the reward at the end there.

So, one final domain: culture. Culture used to be—if you were a primatologist and you said the word “culture,” they instantly denied you tenure. Culture is now the trendiest word in primatology, because we are not the only species that has culture—the non-genetic transmission of information within or across generations. Chimps, for example—known for decades—chimps make tools. Chimps have been found to make twenty, thirty different kinds of tools—different populations of chimps across Africa. They used them in different ways. Their kids learn how to use the tools. And fascinating observation: the sons of females do not learn tool use anywhere near as well as the daughters do, because the sons just sit around there, screwing around and wrestling with each other and the daughters actually pay attention. The cultural transmission is much better in that route. We are not the only species that does that. We are not the only species with a transmission of a social culture.

This was some of my work some years ago: looking at one troop of baboons, which for very complex reasons, developed a culture of very low levels of aggression, tremendous amounts of male-male affiliation. These are two adult male baboons grooming each other. Adult male baboons do not groom each other, except in this troop. And what went on for fifteen years or so is, among baboons, males at puberty leave their home troop and transfer into their adult troop. For fifteen years, males who had grown up somewhere else in the big bad world of normal baboon behavior showed up in this troop and it took them about six months to learn, “We don’t do crap like that here,” and their behavior changed over that time. We are not the only species that has material or social culture. What is unique about us—the incredible byzantine nature of our culture and there is no other species out there that could possibly imagine a ritual like this. Chimps would kill to be able to wear pants with fruit on them. We are unique in that realm.

So, we have seen lots of ways here in which we are just like every other species, until you look more closely. I want to spend the last couple of minutes here on one domain, in which we are in that third category—something absolutely unprecedented. Amid all the versions of that, we think symbolically; we have metaphor; all sorts of stuff. This one strikes me as really, really significant. To state at first very abstractly, we have the capacity to gain the strength to do X by the certainty that X cannot



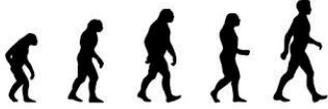
possibly be. What do I mean by this? Let me make it a little less abstract and frame it in a framework completely foreign to me. Kierkegaard--being a good Christian consists of being able to hold two contradictory beliefs in your head at the same time. Let me make it even less abstract. This is a Catholic nun, Sister Helen Prejean, who some of you are probably familiar with. She was the character who inspired the movie *Dead Man Walking*. She has spent her entire life ministering to the spiritual needs of men on death row in a maximum security prison in Louisiana, some of the most frightening humans on Earth. And over and over the years, people come to her and they say, “Why are you doing this? Why are you spending time with those people? They are like the most horrific humans around. There are so many people who are more deserving.” And her entire philosophy is built around two things: Statement, “The less forgivable the act, the more we have to find the means to forgive it. The less lovable the person, the more we have to find the means to love them.” And as a strident atheist, this strikes me as the nuttiest, most irrational, magnificent thing we are capable of as a species. Because over and over what you see is our most exalted behaviors come when we have every reason to think, “You are not going be able to make a difference. That is the way it is. Look the other way. Go back to your own concerns.” And when people are capable of deriving the strength to do X out of the certainty that X cannot be, you get our most magnificent domains of moral imperatives.

So, let me stop at this point. What we see here over and over is, “Yes, yes. We got the same neurotransmitters as every other species. We are just another primate. Our behaviors are on a continuum.” When you look closely, though, we are doing remarkable things. And when you look really closely, some of the things we do are astonishingly unique. And of course, what always has to be said at this point is: for better or worse. So on that point, thank you for coming out this evening.

(Applause)

### ***Meredith Johnson***

If you like this episode and you want to hear more talks like this, please let us know. We are hosting live events almost every month. So if you enjoyed this, we can share all the Being Human talks here on Origin Stories. That means we could have a new episode every two weeks, instead of only once a month. I would love to hear your feedback, so send an e-mail to [originstories@leakeyfoundation.org](mailto:originstories@leakeyfoundation.org). We will also put a poll up on Facebook and we tweet at Origins Podcast. If you want to hear more from Dr. Sapolsky, check out the “Inquiring Minds” podcast. Right after this talk was recorded, “Inquiring Minds” did a fascinating interview with Dr. Sapolsky. You can find that on “Inquiring Minds,” a



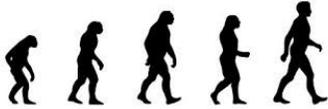
THE LEAKEY FOUNDATION Origin Stories Episode 08 Being Human with Robert Sapolsky

podcast about the place where science, politics and society collide. It's available on iTunes, and at [motherjones.com/inquiringminds](http://motherjones.com/inquiringminds).

As always, Origin Stories is a project of The Leakey Foundation. The Leakey Foundation funds research into human origins and shares that research with the public. Learn more and help support science at [leakeyfoundation.org](http://leakeyfoundation.org).

This episode was produced with support from the Being Human Initiative. Being Human is a joined initiative of [The Leakey Foundation](http://TheLeakeyFoundation) and [The Bauman Foundation](http://TheBaumanFoundation), dedicated to understanding modern life from an evolutionary perspective. You can find out about upcoming events at [leakeyfoundation.org/beinghuman](http://leakeyfoundation.org/beinghuman).

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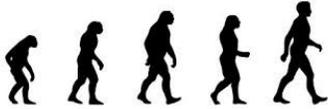
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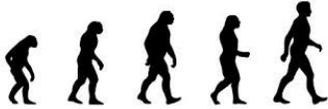
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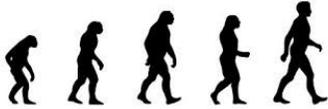
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