

Anthropomorphomania and the Rise of the Animal Mind: A Conversation

ABSTRACT: The conversation that follows concerns patterns of thinking. Comparative psychologist Daniel Povinelli, in conversation with folklorist Brandon Barker, argues that certain anthropomorphizing notions have impeded scientists' attempts to answer these questions: How are animals and humans the same? How are animals and humans different? This conversation supplements other considerations of the Aesop's Fable Paradigm in this special issue by articulating the perspective of an insider to both the science and the culture of comparative psychology, animal cognition, and their related disciplines.

Anthropomorphism in the Science of Animal Minds

Daniel J. "Danny" Povinelli became infatuated with chimpanzees very early. As a high school student searching for some far-reaching mystery to ponder while researching in the library for his role on the debate team, he came across the psychologist Gordon G. Gallup Jr.'s now famous mirror self-recognition (MSR) studies with chimpanzees. Gallup's MSR studies, Povinelli learned, involved the presentation of a chimpanzee's self-image in a mirror after rouge or a sticker had been surreptitiously placed on the animal's face.¹ The central claim of those studies was that chimpanzees who could use mirrors to investigate their own bodies must have some form of self-awareness—not unlike humans. The search for self-awareness in mirror-gazing chimps constituted Povinelli's first encounter with the search for the boundaries of human distinctiveness

in nonhuman animals. As a matter of fact, Gallup's work affected young Povinelli so deeply that he led a charge to liberate all captive chimpanzees, recruiting his high-school debate teammates into a grassroots organization of Povinelli's own making: The Liberate the Chimps Society—LTCS!

In some ways, the LTCS was much more than a teenage infatuation. Povinelli has, after all, spent more than three decades experimentally investigating chimpanzees and human children. But he has come to think about the mirrors in Gallup's MSR studies quite differently. Back then, at the genesis of the LTCS, he did not see that those mirrors—Gallup's investigatory implement of choice—were really just another reflection of the scientific search for humanness in nonhuman animals. They constituted yet another example of a cadre of projective questions in the science of animal minds: Do animals have language? Do they use tools? Do they possess a theory of mind? Do they dance? Make war? Love? Do animals tell jokes? Play games? Trick each other? Suffer grief? Know beauty? Get religion? The list goes on and on. Folklorists will recognize the historicity of these questions and their inherent search for humanness in animal "others" as an intellectual survival of sorts, an outgrowth of nineteenth-century theories of biological evolution. Povinelli referred to this history in the abstract for his presentation, which was a part of our original panel concerning the Aesop's Fable experiments, at the American Folklore Society's Annual Conference in Miami, Florida (2016):

Since Darwin's publication of *The Descent of Man* (1871), the assumption of mental continuity between humans and other species has deeply infected the study of animal cognition. Any ability present in humans is asserted to exist, at least to some extent, in other species. Insistence on mental continuity has limited scientists' experimental methods and muddled the interpretations of data that emerge from them.

The mention of survivals and of evolutionary theories might also call forth, for folklorists, historical reminders of our own pitfalls, represented by such pejorative terms as *anthropocentrism* or *adultocentrism*—both constituting methodological and philosophical problems of projection. That being said, the assumption of mental continuity across species skews more than our understanding of other animals;

the assumption lessens our awareness of that which makes humans uniquely human.

Povinelli and his coresearchers argue that only humans reason via higher-order, theory-like relational abstractions such as space, time, intentions, ghosts, god, and weight. The latter abstraction, weight (as it exists as a part of human psychology), can be easily brought to mind. Our higher-order theories of weight affect our behavior. For example, we understand that the felt perception of a heavy object (compared to the felt perception of a lighter object) is deeply connected to the heavier object's relative usefulness for holding down a stack of papers, for throwing through an abandoned window, for hurling at an unwanted intruder, or for smashing open a thick walnut shell. Humans instinctually abstract from these disparate perceptual scenarios a theory of how weight functions in the world. While chimps and some other nonhuman animals can and do behave in goal-directed ways that afford them "success" in some of these scenarios (e.g., successfully lifting heavy objects or successfully cracking nuts), animals are not successful in these tasks because they wield a higher-order concept of weight. Instead, the animal's achieve their goals via mental processes operating at the level of first-order, perceptual variables, without the necessity for, or dependency upon, higher-order theories. Animals—even impressively intelligent animals like chimpanzees, elephants, dogs, and crows—do not, necessarily, act the way they act and do the things they do for the same reasons as humans. Thus, crows can fly, but they will never build skyscrapers. Yes, they excel at vocally mimicking sounds from their environment (including human words), but they do not carry on conversations. They can be trained to drop stones into a beaker of water in order to retrieve a food reward, but they will never create and share fables.²

The difficult task facing animal studies, Povinelli argues, is not convincing ourselves that we can find evidence of humanness in them. Doing that, it turns out, is easy. Anthropomorphism, like ethnocentrism or adultocentrism, comes easily. The difficult task is finding the will to look more critically into apparent similarities and more honestly at observable differences. In lieu of mirrors in MSR protocols, Povinelli now focuses on metaphorical mirrors: the animals we turn into mirrors when, for example, our experiments reflect folk narratives.

A Conversation with Daniel J. Povinelli and K. Brandon Barker

KBB: It is striking—an Aesop’s Fable being used as a prompt for experimental design. You have said that these kinds of frames say more about the current culture of scientists working on animal cognition than they do about the animals. What do you mean when you say that?

DJP: Oh, for sure. So various birds including corvids will pick up nuts, walnuts, and other nuts, and drop them to crack them open as they are flying around. Or the birds will pick up stones and drop them on mollusks’ shells to try to crack them open. And that’s pretty impressive, right? Now, without the frame of an Aesop’s Fable, did anybody suggest that when a bird drops a stone from that high, and it hits a mollusk shell and cracks it open, that the birds have any theory of the connections between force and the acceleration of mass?

The answer is no. But when the endpoint of their training involves stone-dropping behavior that supposedly actualizes a well-known folk narrative, suddenly the behavior is evidence of a human-like, higher-order understanding of the physics of water displacement.

KBB: Here is the description of the end-point training effect as you described it in *World without Weight*:

End-point training effect: The similarity between human and ape behavior produced as the result of training can be so emotionally striking that it overwhelms the skepticism that might otherwise be generated by the knowledge that it took dozens, hundreds, or even thousands of trials to achieve it. (2012, 343)³

Can you say more about this effect?

DJP: My awareness of the end-point training effect as an overarching challenge to objectively studying animal cognition started quite early in my career, although the significance of it only grew very gradually in my mind. But the fact that it was going to be a big challenge? I remember it distinctly dawning on me, even though it didn’t strongly influence my work yet.

I was in graduate school, and a couple of my fellow graduate students—one in archaeology and another in sociocultural anthropology—decided the students needed to publish a journal, *The Yale Graduate Journal of Anthropology* . . . or something

like that. And this is around 1986, 1987. So they went around eliciting papers from us, and I said, “Yeah sure, I’ve got a little something I’ve worked on for one of my graduate classes.” It was a forward-looking prospectus of the kind of research I wanted to do—that is, comparing apes who recognize themselves in mirrors and are maybe self-aware (you know, Gallup’s mirror theory), to monkeys who don’t recognize themselves in mirrors, and who, according to Gallup’s theory, are not self-aware. So my article was outlining the experiments that I was going to do for my dissertation, a broad overview of the different kinds of experiments. I gave a copy of this article to a senior graduate student, Todd Preuss, who was working with monkeys, becoming a neuroscientist. Todd said, “You know, this is really great, Danny. This is really great. I can’t believe you’re going to be doing all this work, this is great.” And then he said, “But, you know, I think you better loosen up a little bit on the criteria you’ve got down here where you seem to be suggesting that if the animals solve this test correctly on the first, on trial one, that means they have these higher-order abilities (theory of mind, self-awareness, et cetera). But if they don’t pass on trial one, then the animals don’t have these higher-order abilities. I think you better make some room for . . . I mean, trial one is pretty demanding.”

And I thought well, “What are we going to do? Use trial two or three or ten?” And I mean, I was driven. I wasn’t in graduate school to become a professor. I just wanted to do these experiments. I just wanted to work with chimps and do all this creative experimental stuff. I thought, I can’t be spending all this time sorting this out. Trial one would be the most important data point. Anything after that could just be trial and error learning. Rats pressing levers. But the question Todd raised became a pebble in my shoe, and that little pebble in my shoe, as time went on, started cutting both ways. The first one was the way Todd meant it. That, well, you know, it might take even a really smart chimp three or four trials to catch on. And doesn’t mean that they don’t understand higher-order theory of mind or empathy the way you or I do. But, it cut the other way too. I realized that, even if the subject solves the tasks on trial one, I could never really rule out some alternative theories about what the apes or monkeys or children had already learned—before being in my tests—about the ways people and other animals interact and behave, things

they had already learned that they could be using to solve my little task. In other words, they had already had lots of trial ones! Slowly I began to realize what was going on with these experiments wasn't going to be, by itself, diagnostic of the higher-order abilities I was after.

To illustrate the problem, I remember a few years after opening my own chimpanzee laboratory, I put together a videotape of my apes doing a bunch of amazing things and then used the video when I gave academic and public talks. The tape showed trial after trial of the chimps solving amazing tool-using problems. So, a chimp would come in, it would be a hook stick versus a straight stick, for example, and they'd pick up the hook stick and use it to hook something in a precise way when only the hook stick would work. Or, there would be a little hole, and they'd pick up the stick that would fit through the hole and not the one with all of the little prongs on it that couldn't fit through. Or, somebody would show the chimp a floppy tool, and then a rigid tool. The chimp would correctly pick the rigid tool immediately without fooling around with the other one, et cetera, et cetera, trial after trial after trial. But then I would tell the audience, "I don't like to show videos at my talks because, depending on how you edit them, you can tell any story you want." And then I'd show, in reverse order, the chimps going through the same tests, but now all the early trials, over and over, the same tests, over and over and over again, with the chimps picking all the wrong answers, appearing to be fumbling about blindly.

The whole point of this video was, sure, if you get the chimps to a point of competence, they behave just like you or I would. And if I were to test you and then ask you why you're doing it, you'd come up with some explanation, which may or may not be true. Your explanation may or may not be related to the causal factors that determine whether or not you pick up the short stick or the long stick, but you definitely have a theory about it, so you report that theory, that story. And of course we humans do have those kind of theories, or those kind of broad, higher-order explanatory frameworks that we can leverage when we get into a sticky wicket. But if I take an ape, and I train it to some endpoint, and then I just show you that, well, what do you make of the history that brought him or her to that point? Do you think it's relevant somehow? If you do, you might be dismissive and say, "Oh, the apes just *learned*

that.” But, the argument is powerful both ways. What do you mean they just learned it? Humans learned it, too. Are you saying just because they learned it, they don’t understand it? And, conversely, what about the fact that it might take them five trials, ten trials . . . or fifty to have learned it? Let’s just pick a number. Say, a dozen trials doing the kookiest things, even though they’re fully competent adult chimpanzees, and even though they have a lot of experience with other, similar situations. Does that not mitigate against the idea that the chimps are wielding some higher-order, explanatory ability? See? It cuts both ways.

So that little pebble that Todd put in my shoe when I was in graduate school thirty years ago, has only grown bigger. It’s become a fundamental organizing challenge to understanding animal minds that I still don’t think we know how to solve. What is our theory that tells us if the animals do it in three trials, they have access to human-like higher-order cognitive frameworks, but if it takes twenty trials, well then, no, they don’t? Do we have some kind of cognitive theory that can really tell us that, in the abstract? I don’t see one. I think it’s a fundamental problem pressing against the heart of comparative psychology. Every time the discipline turns a little bit, I think that thorn punctures its heart and drains the blood out of the whole organism of comparative psychology. It’s an Achilles heel for 99.9 percent of these kinds of studies in comparative psychology.

Take a crow, for example, and give it a straight wire. The crow has to stick the wire inside a tube to fish out a little basket with a handle that has been put in the bottom of a test tube, a little glass tube. They’ve got to stick that wire down there and hook the mini Easter basket to get their eggs, which in this case are mealworms. Well okay, the crow sticks the wire in there, fiddles around, steps on the wire, bends it, and then eventually after, I don’t know, thirty seconds, a minute, two minutes (it varies), the crow has bent the wire and hooked the Easter basket, and they get the mealworms. Well, okay, how often do animals bend things—especially birds twisting pretty detailed nests? It’s one of the things they do the most with an object like that. And when they stick the wire in the test tube, it bends a little bit, and the Easter basket moves a little bit. So, they pull it out and bend it a little bit more and it moves a little bit more. Then they hook it, and they get it. Was that one trial? How do we divide up the behavior? Is that one trial? And

even if somebody wants to call it one trial, how do we divide up the behavior as arbitrarily defined as one trial by the comparative psychologist? What are all the infinitesimally small steps that led up to that successful action—the endpoint of the animal being able to do it—and come in the next time and be able to do it a little faster and a little sooner, and after that even more faster and sooner?

This goes straight back to Wolfgang Köhler's ideas about "insight." What he called insight was the phase-like transition from one behavioral form to another. He was looking at a situation in which the ape is blindly fumbling around with the wooden crates. Then, the ape goes sit; then suddenly comes back over, stacks the crates (or whatever the task requires) perfectly. Köhler was looking for insight, big transitions, phase transitions. That is when Köhler would go, "Aha, that's evidence of insight!" See, even in the early parts of the twentieth century, Köhler knew that to call it insight—which was a very technical term in his mind—wasn't to say that chimps have the kind of higher-order relational kind of mind humans have—that they have an understanding of space or gravity or time at a higher-order level. What Köhler was saying was that whatever perceptual representations the chimps have in their head, they're reorganized to fit together in a smooth function, and then the ape is then able to go do it, go stitch together little units of action it already has in its behavioral tool-kit and execute the new composite behavior smoothly. But he knew the endpoint positive evidence, the "insightful behavioral transitions," could not tell us whether the chimps had a theory of gravity, a theory of mind, or some other theory like that.⁴

KBB: So in the past, stone-dropping-type behaviors in crows had not been interpreted as evidence of higher-order cognition. If the endpoint-training effect is one reason, are there others?

DJP: Definitely! One other reason, I think, is that the crows in the experiments are constrained in a human-like, controlled environment. I mean, a glass tube, a water vessel—what could say *science* more than a standing test tube with liquid in it? And by the way, I'm not criticizing. The scientists constrained the ways the animals could learn. That's what we do. Their apparatus, the test tube with the water in it, and the glass box with the flapping platform that they used to initially train the crows, it all made sense.

Incrementally, it all makes perfect sense. But when you put an animal in that context—that human-like context when you have a stone and a test tube—there’s really only three things that can happen: 1) nothing, the crow can just hop around, or 2) the crow can drop the stone outside the test tube, or 3) the crow can drop the stone inside the test tube.

And I want to explain to you, at a very personal level, why I reacted so strongly to these studies. I’m sure I would have reacted pretty strongly to any study of an Aesop’s Fable in animal cognition, but this particular study really got to me, and for the following reason. I had spent five years—actually over ten at that point—working on very similar ape physics problems.⁵ Call us obtuse, call us pedantic—you know, maybe some positive epitaphs too . . . patient? But we kept doing systematic variations on every experiment in order to pit some plausible alternatives against each other. We were rigorously testing for higher-order abilities, but we didn’t do experiments that said, “Oh look, we gave them a blue stick and they used that to fish in a banana. So now let’s see how smart they are; let’s give them a yellow stick and see if they can still do it.” I don’t know what theory would tell you the chimp, or some other animal, would not solve it with the yellow stick. What possible theory would that be? I don’t understand that. The chimps thought that yellowness was contacting the banana? Color? No, it’s the extended form, it’s the perceptual projection of the length of the stick on the retina. That’s why they pick the long one and not the short one. That’s why they learn to do that. And so, when you change the color of the long stick . . . well, that was never relevant to their initial learning anyhow. We—very purposefully—didn’t do things like that.

And, okay, so what did we conclude? What are the bedrock principles that govern the chimps’ behaviors? Those principles are certainly not about unobservable, higher-order theories about how the world works. They’re first-order, perceptual principles. Especially *physical contact* between objects. Chimps and other animals are very sensitive to perceptual contact between objects. Contact seemed to be their bedrock principle—making one thing, a stick, contact another things, an out-of-reach apple. Now, they learn more than that—relationships among perceptual forms more than that. For example, they might learn “Oh, actually, place the tool *behind* the banana, and then make contact.”

But, even these instances are silent with respect to whether or not the chimps have any idea of *force* or its related theoretical phenomena. The bedrock principle is contact. That is what the chimpanzee starts with. This is a primitive operator in their perceptual-action system. It's about contact. When they are trying to get an objective, they're trying to get one implement to make contact with another, just like they would with their hand. If they can do that, they are going to ignore a lot of other perceptual information they might otherwise attend to. Contact is so primitive and so bedrock that it sucks the animals in, causing them to make all kinds of mistakes early on that seem ridiculous from a human perspective.

Here's an example that we first looked at in *Folk Physics*. We presented the chimps with two towels stretching away from them and gave the chimps the option to pull one or the other towel in order to retrieve an apple. In one scenario, an apple was resting on top of one of the towels and another apple was resting on the floor close to the second towel, but not touching it. In this situation, the chimps had no problem grabbing and pulling the correct towel to retrieve the apple. But when we changed the scenario just slightly, and had the apple resting on the floor but *touching* the second towel, the chimps pulled the second towel just as frequently as the first towel. They didn't intuitively grasp the obvious connection between the apple's weight and why pulling the first towel is the only way to retrieve the apple.

So, what do we have in these Aesop's Fable studies? We have a crow, who sticks his beak inside a test tube, but the worm is too far away to make contact with it. But if the crow has a stick, it picks up the stick and spears it down in the tube, right? Why? Because they can make contact. And eventually, the crow pulls the worm up. Oh, but now the crow doesn't have a stick, it has a rock. So, what happens when they drop the stone into the tube? Oh, and by the way, the crows have to be taught to drop the stone inside the tube. Well, the stone can make contact with the worm, because the worm's *inside* the tube, not outside of the tube. And when the crows do that, the worm jiggles or comes closer to them.

When I explain this, some people say, "Oh, the worm doesn't move that much closer to them." But think about it like this. I have a chimp and a string and a rope, and the rope is tied to a banana over there, out of reach. Then, I tie another string over here that

is not tied to the banana. If the chimp pulls on the connected string a little bit, the banana wiggles. If they pull on the unconnected string, it doesn't wiggle. What do you think the chimps are going to do? Surely chimps are smart enough to keep track of which of their actions make the banana wiggle! I mean, really, what animals couldn't keep track of that? Then some people say, "Okay fine, but the crows don't try to push the stone through the bottom of the glass tube. They actually drop it at the top—furthest away from the worm." Wait, who thinks birds are so dumb that they don't realize that they can't make contact through the glass? I mean, you're seriously saying that the fact that the crows learn that a rock won't pass through glass somehow implies the alternative that they understand the physics of mass and water displacement? I honestly thought we were past that kind of faulty reasoning.

The crow is trying to drop the stone to hit the worm. And when they do, the worm moves closer to them. Or they get the worm to wiggle. And then they repeat the behavior with another stone. How is that any different than the chimp with the string and the banana? But if you ask this question, supporters of scientists running Aesop-Fable-like experiments say, "Hah, you're just a skeptic." Or you're told, "Hey, we're just being neutral. We just want to show what the crows can do."

KBB: This seems to be closely aligned with another cultural pattern you named in *World without Weight*:

Scrub-jay imperative. Any [task which purportedly demonstrates a] cognitive-like phenomenon in one species (read: scrub jays), is an immediate threat to the cognitive integrity of other species (read: apes) until [the ability] is demonstrated in them—regardless of whether [the task] makes any ecological sense whatsoever to other species. (2012, 344)

Does competition between the animals (and consequently between the scientists studying the animals) drive any of this?

DJP: Long before the Aesop's Fable studies, I had been very sensitive to the dynamic with chimps versus orangutans and gorillas, and maybe monkeys a little bit. I knew there were reactions to a perceived chimpocentrism. Somebody would say, "That, what you trained your chimp to do, that's nothing, I can get my orangutan to do that too." Or, "Don't leave out the gorillas." Or even, "Don't

leave out my monkeys!” But, once the scrub jays became a thing—at first because of claims these birds had autobiographical-like memories or that they could reason about when another bird was trying to deceive them—a curious thing happened to me. At first, I thought, “Okay, perfect. Now, we can at least start to think more critically about what kinds of behaviors could ever really provide evidence of higher-order cognitive abilities. I mean, if we just want to understand chimps the way we understand leopards, or ants, or gazelles, that’s one thing, right? But, if we’re aiming toward some understanding of their cognitive economy that we are then trying to really distinguish from human cognitive economies, that’s a totally different enterprise. So I was thinking, “Great, as soon as people learn that the crows and scrub jays can do exactly what the chimps are doing, and maybe even doing it faster or more accurately, maybe we can finally make some progress.” I thought we would start to recognize, “Okay, so these kinds of experiments don’t have anything to do with the evidence of higher-order thinking that we are after.” Or, at least, I thought we could begin to try to specify how the scrub jay’s reasoning relates to the higher-order processes we are trying to understand in humans. But that’s not what happened at all. Instead, people said, “Our crows do something nobody’s ever shown in chimps, or they do it faster, or whatever, so we have better evidence with the crows than you do with your chimps.” Totally ignoring the fact that the evidence with the chimps wasn’t diagnostic of higher-order reasoning. No, see all of those studies are operating on the basis of intuitive folk theories that we humans have come up with to explain our own behavior. In other words, those tests aren’t diagnostic for *human* higher-order abilities any more than they are for the chimps or crows.

KBB: So, we are still trying to understand how higher-order mental processes like theories about weight, water displacement, of theory of mind affect human behavior?

DJP: So, yes exactly . . . precisely. Let me just elaborate a little bit on it. I’m not denying that we have—to use an analogy—I’m not denying that we have keys that can solve puzzles involving opening up locked boxes or figuring out our own and others’ inner psychology. I’m not denying that some of our keys are of that type. We have some keys that represent people’s wicket safes, so to speak—keys allow us to open the boxes of our own and other

peoples' minds. Hence, those keys affect our behavior. We can figure out, "Oh, I get it. Brandon *believes* this. Now wait, why's he doing that? Oh, he must *feel* this way." And somehow those keys are causally related to things that we actually *do*. I'm not denying that. What I am denying is that our folk theories are a good way to know which of all the different types of keys—our human higher-order representational keys, as well as the perceptually-based keys that we share in common with animals—that we are using in any given situation. It's as if we're blind, fumbling around with all these keys and then . . . boom, the box unlocks. Then we say, well, how did I do that? And when we search into the contents of our consciousness for an answer, the only keys we can really see—or at least the sexiest ones—are in the language economy. These are the higher-order keys and boxes, such as the components of our explanatory narrative: "Oh, I did that because I *thought* he was *feeling* such-and-such." Now, look, I'm not saying we didn't use a key like that in that example. But, I'm saying we're pretty much blind unless it's really effortful, from the ground up, problem solving. When Einstein sits down and starts postulating four-dimensional space-time, he's wielding—with a lot of time and with great effort—some of these higher-order keys. When couples are having a discussion, you know, about whether they love each other or not, they get tangled up in all that. They're explicitly wielding these keys. But in that case, how does the lovers' higher-order key wielding connect to what they actually do? How does it fit into the causal steps—the smooth, or even erratic, shape of our behavior? That's what I'm saying is pretty opaque.

And this is very difficult to communicate. On the one hand, to deny that we know exactly the causal effects of those keys on our everyday behavior, or even in some test, is not to deny that they actually do have a causal effect on our behavior. It is to say, "Look, it's really, really complicated even for humans. You think having a crow drop a stone in a tube to get a worm is going to answer the questions for a crow?"

KB: Let me see if I can rephrase what you're saying. If a human were to do something that seems like the human is doing it because the human has a theory of time or gravity or some other higher-order theory, that may or may not be true? There are gaps in the scientific understanding of human and animal cognition on both sides affecting comparative psychology?

DJP: You know, narratives . . . a couple decades ago, I started writing a paper called “On Naturalizing Narrative.” I started playing around with an idea a little bit that lots of people have thought through really carefully.⁶ The questions I had in mind were these: What are explanations for? And, how do explanations fit into storytelling? And in particular, how do things like theory of mind and references to mental states fit together in the mental worlds that narratives create? We started doing some experiments comparing chimps and children in situations where humans would naturally search for explanations about why an unexpected phenomenon occurred. And I remember when it dawned on me: An ape could never tell a story, out loud or even in its head.

KBB: When?

DJP: Well, it was in the late nineties when I was writing up all the results from our first big set of tool-using studies, the folk physics studies, and I put a little vignette, a little thought experiment, at the end of the book. And I was like, you know even something as simple as the story about “Why did the chicken cross the road?” The little kid will come up with a million explanations for why. They may or may not understand the joke related to it, but they can come up with a narrative-like answer: “Oh, because his mom was lonely and she had to go over there.” Or, “Her daughter chicken was over there, her little chicken was over there, she needed to go be near her.” Any explanation under the sun. And then it occurred to me that, wait, what if chimps do not have these higher-order abilities, these explanatory frameworks, at all? Their answer to why did the chicken cross the road, would be, “Yes.”

In other words, chimps keep track of—form memories of—all sorts of perceived regularities. They can predict them; they can see them and hear them, notice them. The regularities of experience are vital to them in the sense that they have important consequences for what is going to happen. They can even be curious and do things that gather information about those regularities. And so do we, we notice all those same things. Well, not exactly the same things—what any species notices and keeps track of perceptually is going to be different, say the difference between what a tick or bee or a monkey of human keeps track of. So for both of us—chimps

and humans—those sorts of things, the relationships among all these first-level perceptual representations we form in our heads, are crucially important in driving our behavior. But if we set aside chimps for a minute, there is this other way that humans think, which is tangled up with language somehow, that allows us to do all this other stuff, like telling jokes and creating fables. And, most of the time that is where our minds are, so to speak—in this higher-order explanatory narrative space—so we give explanations and we give them in a narrative form most of the time. But that does not mean that most of the time we really directly see ourselves wielding specific keys and turning specific locks.

KBB: What was it about being at the end of *Folk Physics*, which was so much about tool use, that brought on this question about narrative?

DJP: It really went more like this. At my labs, we started doing all this work on theory of mind, just as a global flare of interest had started on the subject. The more I did that work, however, the more I became convinced that my childhood exuberance about the chimps' mind was not very well grounded in the evidence. And the more I worked with chimps, the more their behavior seemed to be saying, "We have no idea what the hell you're asking us right here." And, in my mind that got tangled up with the problem of the endpoint training effect. Because it took them so long to learn something I thought they would understand instantly—I made the false assumption they couldn't possibly understand it the way I understood it if they had to learn it.

Okay, so as the kind of evidence like that mounted, it began to put a lot of pressure on the folk theories that scientists were using, and most importantly, me. The folk theory I had was, "Oh, well I know how I would do, I know what I would do in that situation, and I know *why* I would do it. And, so if the chimps don't do it, that's because they don't understand it the way I do." But then I started realizing that there was a problem for all of us working in the field. Well, for everyone, really. How do I know why I'm doing what I'm doing—you know . . . the key problem? I'm still talking about the theory of mind research right now. I started wondering about where we could find the causal imprint of the human ability to represent other minds in our behavior, in our free-flowing behavior. I was not trying to think about an experiment. At this point, I was just thinking about everyday interactions. I said, "Well,

obviously, we talk about mental states. We talk about unobservable mental phenomenon. So, you know, we *do* represent these things.” But still, what about the imprint on our nonverbal behavior?

And I started thinking, “Well maybe, it has to do with building up narrative, stories about other people.” You know, so we trade back and forth our impressions of people’s dispositions—their mental dispositions. And that’s tied up to those people’s behavioral dispositions. And, we go offline from social interactions and start building up a linguistic representation of others in terms of mental states—beliefs and desires and emotions—all these things. And that allows us to make shortcuts to determine others’ behaviors. I published this—a little tiny little summary of this idea—in a book chapter, called “When Self Met Other.” But that book chapter—you know, like all these book chapters in science used to be, I wrote it in 1995, and it wasn’t published until 1998, or so.⁷ That was in the heyday when we were doing all these tool studies. When I went back to finally look at the proofs of this, when it came out, I read that paragraph, and I realized what we were finding with the tools was analogous with what we were finding in the theory of mind studies. You know, animals just couldn’t generalize from one context to another unless it’s a perceptual generalization.

I realized at that time that this whole thing might be best captured in terms of a broader framework that was outside of theory of mind. So it occurred to me that the apes—and crows and bees, whoever—have a rich *what*-system. They’re actively exploring; their minds and brains are churning away trying to figure out what is around them. They’re building up perceptual representations of what *has* happened, and then that’s related to what *will* happen, and so in the end that’s what motivates their actions. It’s a *what*-system. And, it has to be that way—even for humans—sounds, sights, colors, shapes, other organisms, their actions, fruits falling from trees, green fruits taste bitter. All the senses, the sense of touch, all the ways we can go about perceptually representing things that then correlate with what happens next. Hearing a loud lion definitely is predictive of seeing a lion show up. That is a hallmark of a rich *what*-system.

But humans, in addition to having the same kind of *what*-system that chimps have because of our evolutionary similarities—we also evolved a *why*-system that’s tied up with natural

language, somehow. It was coincident, I speculated, with the evolution of natural language. Now, that was not a very meaningful speculation because I had no thought or specific claim—I didn't side with any of the theories about language, you know, theory of mind or any of these other things. I just noted that, well, what makes humans really different is language. And it probably is no coincidence that it's in language that we talk about these higher-order things—whether it's tools or whether it's mental states. And see that story about the chicken crossing the road and asking the child? Of course, the answer to that question can be about more than mental states. But I began to suspect that even the framework, even the form of having an explanation . . . a chimp might not have that. Even if they tried to substitute perceptual content into the framework, they do not have a *because*. Things do not happen *because of* another thing. This kind of thing happens, and then this kind of thing happens. This is more likely than that. And we're like that, too. But because we have language, we have this other format, and one of the effects of that are higher-order concepts and these explanatory formats.

Apes wouldn't even have an explanatory format. They form symbolic representations of perceptual content, and they can arrange those things with some degree of flexibility, but there would be no complex, higher-order syntax. There is a weak compositionality about their mental economy. But there's no linguistic framing. All of the things that make language possible, for example, explicitly keeping track of what philosophers call *types* versus *tokens* . . . For chimps, there's no type *because*, there's no type *why* that they can track in their mental economy. Of course for that matter, there's no *type* mental state, gravity, ghost, and so on and so on.

KBB: Fables that humans tell—at least in their contemporary iterations—are often attached to a moral. It seems interesting and somewhat paradoxical, then, to associate an animal's behavior with a narrative that expresses a moral, which would be understood as a quintessential part of people's *why* and *because* ways of thinking. I mean, necessity is the mother of invention because necessity makes “people” think harder about difficult situations, or it makes people persevere when obvious, old answers do not solve a problem. Either way, this feels like a *because/why* scenario. Why map that onto animal behavior?

DJP: I have lived through this trend, where it is thought that science should create a sensation of interest or wonder in the general public who are looking at it—a sensation that is about more than just the content of the science. So in this case, the idea, it seems, was to try to explicitly find some cultural frames and stories to package some scientific research into. Then, come up with headlines that say my crows that are smarter than your five-, your seven-year-old child. Come on, because of this Aesop’s Fables thing? The enterprise is weirdly inverted: “We’re going to give the same test that we invented from an Aesop’s Fable to five-year-old children. And look, the fable’s actually truer about crows than it is about children!” Brandon, as you’ve pointed out a million times to me, the fable was never about the cognitive ability of crows dropping stones and a pebble to get the level of the water to rise up. It was never about the cognitive ability of anybody—humans or crows.

So when I first saw that, I was just like, “Okay, it’s over.” I was already getting out of the field at the time, but I was, like, “Now we’re doing Aesop’s Fables? Okay, it’s over. They’re just going through the fables one by one.” I was apoplectic because I knew that there was no way to engage intellectually with these arguments. I started calling it *anthropomorphomania*. How can you rationally engage with a mania? When I read the Aesop’s Fable experiments, I said, “It’s rats pressing levers. That’s all this is. It’s rats pressing levers and learning that they get a pellet—a Noyes trademark food pellet.” I thought, “How did we go this far backwards?” We’ve returned to rats-pressing-levers-to-get-a-pellet, but now we’re wrapping them in the cultural frame of a fable. Just when I thought there was a chance we’d start really exploring the *animal* complexities of the minds of different animals, and stop with the obsessive search for human higher-order abilities—just when I thought we had realized how difficult experimentally addressing those questions about higher-order mental abilities is even in humans—we’re back to lever-pressing rats?

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Notes

1. Gallup (1970) exposed four chimpanzees to their mirror images and reported the emergence of behaviors that included exaggerated facial movements while looking at their image and using their hands and fingers to explore and manipulate otherwise visually inaccessible parts of their bodies (e.g., their noses, eyes, teeth, and anogenital areas). To confirm their apparent ability to recognize the correspondence between their own body and the image in the mirror, Gallup drugged the subjects using one mg/kg phencyclidine hydrochloride (brand name Sernylan, also known as PCP or angel dust). He then marked their left upper eyebrow and right upper ear, using a bright red, tactile free, odorless dye (Rhodamine B). These regions of the face, along with the specific marking substance, were explicitly chosen so that upon recovery from the PCP the subjects would have no tactile, olfactory, or visual cues that they had been marked. Five to eight hours later, the subjects were observed for thirty minutes. During this thirty-minute control period, the number of times the subjects touched the marked regions of their face was recorded by a human observer. Immediately following this period, the mirror was reintroduced, the subjects were again observed for thirty minutes, and all mark-directed touches were recorded. Gallup reported a substantial increase in touches to the marked regions in the test period compared to the control period.

2. For more complete introductions to Povinelli's core arguments—including accessible explanations of the ways that humans reason vis-à-vis the ways chimpanzees reason—we recommend two articles, "Behind the Ape's Appearance: Escaping Anthropomorphism in the Study of Other Minds" (Povinelli 2004) and "Through a Floppy Tool Darkly: Toward a Conceptual Overthrow of Animal Alchemy" (Povinelli and Penn 2011).

Those interested in Povinelli's technical and experimental work should seek out his books, *Folk Physics for Apes: The Chimpanzee's Theory of How the World Works* (2000) and *World Without Weight: Perspectives on an Alien Mind* (2012). Of course, strong scientific arguments are based upon copious amounts of empirical, experimental data, and the task of considering a large amount of data at once is made easier by the fact that both of these books buck the scientific trend of publishing every experiment as a one-off journal article by gathering many experiments (twenty-seven in *Folk Physics* and thirty-two in *World without Weight*) into a single manuscript in order to make a cohesive and sustained argument.

3. This description of the End-point Training Effect was first published as a "Folk Psychological Challenge to the Objective Study of Ape Intelligence" in Povinelli (2012, 343).

4. See Köhler (1927). For a more complete discussion of Köhler's work on insight, see Povinelli 2000, 75–84.

5. See *Folk Physics for Apes* (2000) and *World without Weight* (2012), also mentioned in the previous note.

6. Consider local character anecdotes for folkloric evidence supporting the notion that people's stories about other people affect our understanding of other people's behavior (e.g., Mullen 1988, 113–29; Cashman 2008, 125–37.)

7. See Povinelli and Prince (1998).

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