

Tuesday, 22 February, 2011

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Woof: Happy Valentine's day!

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Photo: [Clemi2000](#)

The mute swan displays elaborate courtship rituals to woo its lifelong mate.

Admit it: You love your dog, your cat, even your white rat.

And so you're planning to lavish a platter of filet mignon on your doggy-love... a plank of sushi-grade tuna on kitty numero-uno, and some aged cheese on your rodent.

But do our dogs, cats and rats love us back?

Sure, parrots are endlessly uttering "[I love you](#)" on You Tube, and some bereaved dogs seem to grieve for their dead owners.

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© David J Tenenbaum

Are these cats in love, or do they just like to sleep on each other?

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And yes, some animals "love" to spend time together.

But that doesn't answer our nagging question: **Can animals really love?**

Or are we projecting our own feelings of affiliation, closeness, and passion on beasts that don't have the

mental machinery to love?

Almost like being in love?

More than half a century ago, Harry Harlow, a research psychologist at the University of Wisconsin-Madison, performed experiments that forever changed our view of human and animal emotions. At a time when academic psychologists explored learning and behavior by studying rats, when low-grade learning in a “Skinner Box” was considered high-grade science, when hospitals limited contact between mothers and their newborns, Harlow focused on maternal touch and the emotional life of monkeys.

Harlow removed infant macaques from their mothers, then raised them with a mother surrogate made of cloth or wire. In some experiments, both surrogates were present.

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Photo: [Singularity](#)

Psychologist B.F. Skinner designed these “air cribs” for babies to ease parental burdens and facilitate child development, but the absence of human contact may stunt emotional and physical development, not foster it.

Monkeys with the cloth mommas grew up fairly normal, but infants raised with only the wire monkey became fearful and desperate. Their behavior was so bizarre that they seemed psychologically broken by the lack of a loving — or at least a cuddly-if-inanimate — mother.

Infants that had access to both types of bogus mother still relied on the cloth mother for reassurance even if the wire monkey held their bottle.

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Photo: Harlow Primate Laboratory, University of Wisconsin-Madison

This baby macaque was one of the lucky ones that psychologist Harry Harlow raised by a surrogate cloth mother, which gave some approximation of maternal emotional comfort. Infants raised on wire frames shaped vaguely like mom developed a range of “psychotic” behaviors.

Harlow interpreted the lifelong devastation of maternal deprivation as proof that infant monkeys need love, and that became early, influential evidence that animals can love, says his biographer¹, Deborah Blum, a professor of journalism at UW-Madison. “Up until that point, people were arguing that these animals were not capable of having emotions. Harlow led the way in demonstrating that these animals loved, had affection, mattered to each other. He used the word ‘love’ very deliberately,” Blum adds, even though his fellow psychologists were highly skeptical, not to say scornful, of that notion.

It didn’t take popular psychology, aided by Harlow’s humorous, down-to-earth approach, long to realize that the then-current “scientific” preference for antiseptic infancy would deprive young people of necessary contact, Blum notes. The instinctive desire to hug an infant, it turned out, gained support from the most rigorous scientific experiments.

love ('lʌv), *verb.* to hold dear, to cherish, to feel a lover’s passion, to revere.

My romance

Scientists who say that primates need maternal love are no longer mocked by their peers. But what is love? Charles Snowdon, a UW-Madison professor of psychology who has explored primate behavior for 35 years, offers this definition: “a preference for one other individual that is more or less exclusive and long-lasting, and that transcends other relationships.”

Animal love is evident in behavior when animals are separated from their mates, Snowdon says. “In species that form lifelong attachments, if a mate dies or disappears, often the remaining mate does not form a new pair bond at all.”

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Photo: [Postdlf](#)

Small monkey with a big heart: The mates' reunion in the cotton-top tamarin resembles reunions among human lovers: hugging, cuddling and "love" making.

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Photo: [Sergey Yeliseev](#)

The jackdaw is a relative of the crow. Frans de Waal of Emory University told us that when he used to work with jackdaws, the "widow" in a couple sometimes died shortly after the mate. (According to a new study²), married people are 1.4 times more likely to die after losing a mate.)

Snowdon says the cotton-top tamarin he studied form strong attachments. "If they were separated, they would begin long calls, at a rate much higher than they would give when together. These plaintive calls would last for the entire 30 minutes of separation. When they were reunited, they cuddled and often had sex."

As if that did not sound human enough, Snowdon next floored us by discussing “romantic love.” Decades ago, psychologists worked overtime to avoid being accused of anthropomorphism — projecting human qualities onto animals. Now it’s kosher to talk about an emotion once restricted to the primates that buy heart-shaped [tchotchkes](#) each February.

Snowdon says romantic love supports the bond in a mated pair, and it’s not just about primates. “Albatrosses and geese appear to form lifelong pair bonds, and robins, blue jays and cardinals might form relationships that last for at least one breeding season; these are strong attachments.”

Snowdon adds that experiments with titi monkeys belie the notion that the sole goal of animal attachment is to nurture the next generation. “If you separate the mother, father and infant from each other, and give them a choice, mothers and fathers choose to be with each other and ignore the baby. It is clear that pairs want to be with each other, to the exclusion of the baby.”

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Photo: [Steven G. Johnson](#)

Have these titi monkeys spotted Valentine’s day on the calendar! The monogamous titis, native to South America, often intertwine their tails while sitting or sleeping in a tree.

Like someone in love

While Harlow relied on observing behavior, today scientists study the brain chemicals that mold the Valentine’s heart. One key subject is the hormone oxytocin, which plays a critical role in social bonding and love, both animal and human.

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Photo: [Larry Young](#), Center for Translational Social Neuroscience

The hormone oxytocin is elevated in animals and people with a close, long-term attachment, and helps explain the bond between prairie voles. This mousy, monogamous mammal is a focus of animal love-and-sex studies.

Oxytocin, originally identified for its role in helping mothers bond with newborns, also rises in men and women after sex and other close, emotional encounters. In the big picture, oxytocin enables attachment in humans and other animals, Snowden says. “You don’t find oxytocin elevated in animals unless they form an adult attachment with one other individual.”

The brain responds to dopamine, a feel-good chemical that is released during many pleasurable activities, including drug-taking. Dopamine also plays a role in animal love – and “marital” fidelity. Mated prairie voles have a higher level of a specific dopamine receptor in a brain region called the nucleus accumbens, says Karen Bales, an associate professor of psychology at the University of California at Davis. “When these are turned on, that prevents them from forming a second pair bond.”

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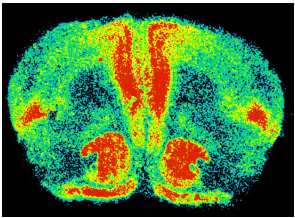


Photo: [Larry Young](#), Center for Translational Social Neuroscience

The prairie vole’s love centers, AKA oxytocin receptors, are highlighted in orange in this brain portrait.

When owners interact with their dogs, both sides have surges in oxytocin, says Bales, who studies primates at the California National Primate Research Center. “That puts a check in the ‘dogs can love’ box.”

Love fur sale

Because dogs are the most glaring example of an animal that seems to love people, we phoned Patricia McConnell, an author³, and animal behaviorist at UW-Madison. She gave us two key reasons why dogs can love: “Their physiology for creating social attachment is so similar to ours, and they behave in ways that, if any human did it, we’d label it love, attachment.”

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Like many other mammals, dogs respond to oxytocin: “It’s a huge part of social attachment, and physiologically it’s almost an exact replica of oxytocin in humans,” McConnell says.

Dogs appear to grieve, McConnell adds. “They get distressed when someone they are attached to is gone. There are lots of credible examples of dogs risking their lives to save a human. We are so different from dogs in so many ways, but in some ways, we are more similar to them than to other animals. What other species is obsessed with the fate of a ball?”

If dogs love us, what about each other? “Absolutely, yes,” says McConnell. “I have seen dogs behave as if they instantly fell in love: they are animated, their eyes were shining, they were extra playful. But I’ve also seen dogs that clearly took an instant dislike to each other.”

Dogs, like people, are picky, so it’s not always possible to replace a deceased member of a tight pair, McConnell says. “When people get another dog, they’re often surprised that the resident dog is not thrilled. We see the exact same thing in people: Personalities can clash or meld. When someone you know dies, it will not help if a stranger walks in off the street.”

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This Great Pyrenees and JRT/Rat Terrier
– together since puppyhood – have
formed a strong bond to each other.



Photos ©S.V. Medaris
Ivan (Great Pyrenees) and Dexter (Jack Russell/Rat Terrier) demonstrate the bond of brothers.

You don't know what love is



Still, animals can't say what they are feeling, and so we must rely on measurements and observations. Interpreting animal behavior can be difficult, says Marga Vicedo, a historian of science at the University of Toronto who has written about Harlow's experiments.⁴

Vicedo recalls members of an animal-behavior seminar who would "discuss, week after week, how you would interpret it when they look left — or right? You are seeing a behavior, and from the behavior, you have to hypothesize about the emotions, but there is not a perfect correlation between animal and human emotions."

Interpreting the emotional basis of behavior is difficult enough with people, Vicedo observes. "We may laugh at a meeting, but inside we are depressed. You can only observe behavior, and have to figure out its relationship to emotion and feeling."

Stephen Marc Breedlove, who studies hormones and behavior at Michigan State University, reiterated that problem. "Whether you think your dog loves you or your boyfriend loves you, there is the same problem: you see the behavior and from that, you infer these feelings. With a partner, you can ask, but since people do lie, that is not completely reliable."

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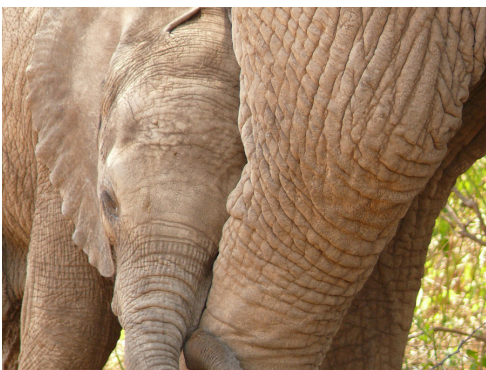


Photo: [Mara 1](#)

Scientists believe that attachment in elephant families may rival attachment in people. Love between mother and baby is surprisingly strong; mother-daughter bonds often last 50 years.

My one and only love?

Our improved understanding of what's going on inside the brain provides more ways to analyze animal emotion, Breedlove says. "In certain species, there is neural circuitry that helps monogamous pairs stay attached to one another. We know the same systems can be present in humans — and although we don't know they serve the exact same function, there is some danger in insisting we are absolutely unique in every way. Natural selection produces a continuum of traits, we can't have something arise from nothing."

Indeed, evolution is a great re-user of its own inventions, as Breedlove stresses. "What is the evidence that makes you think love arose absolutely *de novo* [without precedent] in our species? And then, when did it arise, in Mesopotamia?"

The notion that animals can love is part of a scientific sea change. Once upon a time — even after Harlow — identifying emotions in animals was considered anthropomorphism, a fatal fallacy that could ruin a career in psychology or animal behavior.

Now, we have seen a "change in the zeitgeist [the spirit of the time]," says Breedlove. "People are open to the possibility that animals have emotions, and I think that is a step forward, a sign of maturity of the field. Anthropomorphism is definitely a risky business, but people are less worried that they will be written off as cranks just because they say something that could be interpreted as anthropomorphism."

As we've seen, many scientists are even willing to discuss parallels in animal and human love. Heresy!

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Photo: [Kjunstorm](#)

Monogamous bonds between flamingos are constantly reinforced, through vocalizations, feeding side-by-side, teamwork during conflicts with other birds, and elaborate courtship rituals.

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Photo: [Dora Biro](#)

Chimp mothers may continue caring for dead babies. Does this powerful mother-infant bond amount to love? Maybe, but we can't definitively know what emotions drive the mother's behavior.

Almost like being in love

In burying the old “animals are just beasts that cannot have feelings” mentality, nobody has been more influential than primatologist Frans de Waal of Emory University. When we asked whether animals can love, he responded, “Mammals are almost made for attachment, because of their maternal care obligations, the female is attached to her offspring and vice versa. There is a whole brain circuitry attached to that.”

Still, the subjective aspect is hard to know, de Waal admits. Even though studies find attachment, affiliation — and arguably love — in rodents, dogs and primates, “what they experience is not something we can know, but given that they show all the signs of attachment, they spend time together, are distressed if they are separated, and show what looks like happy behavior when they are reunited,” it's unclear why we should deny the obvious explanation: these animals have emotions.

“If a chimp's offspring dies,” de Waal says, “it usually keeps carrying it around until it falls apart, so even though the offspring is dead, the attachment stays intact; these are all signs of strong attachments.”

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Comes love

We asked de Waal if we could summarize his view as, ‘It looks like love, but we’ll never know?’ but he said we had it backwards. “My assumption is the other way around, that if animals that are closely related to us, as monkeys and chimps certainly are, and do similar things under similar circumstances, we have to assume the psychology behind it is similar. It would be very inefficient for nature to produce the same behavior in different ways in a monkey and a human, it would have to create a different mechanism, a different psychology and neurology. From the Darwinist standpoint it does not make sense that monkeys would arrive at the same place via a different way.”

de Wall said his view is that “If chimps show strong attachment, we have got to assume the psychology is similar, and that would include the experience. That is not an assumption that is easily verified, but I think it is better than the opposite, that it looks the same, but is probably different.”

Terry Devitt, editor; S.V. Medaris, designer/illustrator; David Tenenbaum, feature writer; Amy Toburen, content development executive; Jenny Seifert, project assistant

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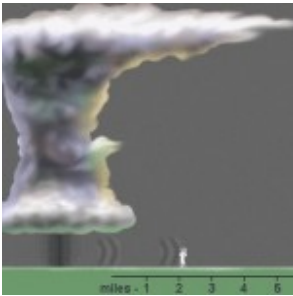


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