

0:15

I was born in Den Bosch,

0:17

where the painter Hieronymus Bosch named himself after.

0:20

And so I've always been very fond of this painter

0:22

who lived and worked in the 15th century.

0:25

And what is interesting about him in relation to morality

0:27

is that he lived at a time where religion's influence was waning,

0:30

and he was sort of wondering, I think,

0:32

what would happen with society

0:34

if there was no religion or if there was less religion.

0:37

And so he painted this famous painting, "The Garden of Earthly Delights,"

0:40

which some have interpreted

0:42

as being humanity before the Fall,

0:44

or being humanity without any Fall at all.

0:47

And so it makes you wonder,

0:49

what would happen if we hadn't tasted the fruit of knowledge, so to speak,

0:52

and what kind of morality we would have?

0:55

Much later, as a student,

0:57

I went to a very different garden,

0:59

a zoological garden in Arnhem

1:02

where we keep chimpanzees.

1:04

This is me at an early age with a baby chimpanzee.

1:06

(Laughter)

1:09

And I discovered there

1:11  
that the chimpanzees are very power hungry and wrote a book about it.  
1:14  
And at that time the focus in a lot of animal research  
1:17  
was on aggression and competition.  
1:19  
I painted a whole picture of the animal kingdom,  
1:21  
and humanity included,  
1:23  
was that deep down we are competitors,  
1:25  
we are aggressive,  
1:27  
we're all out for our own profit basically.  
1:30  
This is the launch of my book.  
1:32  
I'm not sure how well the chimpanzees read it,  
1:34  
but they surely seemed interested in the book.  
1:39  
Now in the process  
1:41  
of doing all this work on power and dominance  
1:43  
and aggression and so on,  
1:45  
I discovered that chimpanzees reconcile after fights.  
1:48  
And so what you see here is two males who have had a fight.  
1:51  
They ended up in a tree, and one of them holds out a hand to the other.  
1:54  
And about a second after I took the picture, they came together in the fork of the tree  
1:57  
and they kissed and embraced each other.  
1:59  
Now this is very interesting  
2:01  
because at the time everything was about competition and aggression,  
2:04  
and so it wouldn't make any sense.  
2:06  
The only thing that matters is that you win or that you lose.

2:08

But why would you reconcile after a fight?

2:10

That doesn't make any sense.

2:12

This is the way bonobos do it. Bonobos do everything with sex.

2:15

And so they also reconcile with sex.

2:17

But the principle is exactly the same.

2:19

The principle is that you have

2:21

a valuable relationship

2:23

that is damaged by conflict,

2:25

so you need to do something about it.

2:27

So my whole picture of the animal kingdom,

2:29

and including humans also,

2:31

started to change at that time.

2:33

So we have this image

2:35

in political science, economics, the humanities,

2:37

philosophy for that matter,

2:39

that man is a wolf to man.

2:41

And so deep down our nature's actually nasty.

2:44

I think it's a very unfair image for the wolf.

2:47

The wolf is, after all,

2:49

a very cooperative animal.

2:51

And that's why many of you have a dog at home,

2:53

which has all these characteristics also.

2:55

And it's really unfair to humanity,

2:57

because humanity is actually much more cooperative and empathic

3:01

than given credit for.

3:03

So I started getting interested in those issues

3:05

and studying that in other animals.

3:07

So these are the pillars of morality.

3:09

If you ask anyone, "What is morality based on?"

3:13

these are the two factors that always come out.

3:15

One is reciprocity,

3:17

and associated with it is a sense of justice and a sense of fairness.

3:20

And the other one is empathy and compassion.

3:22

And human morality is more than this,

3:25

but if you would remove these two pillars,

3:27

there would be not much remaining I think.

3:29

And so they're absolutely essential.

3:31

So let me give you a few examples here.

3:33

This is a very old video from the Yerkes Primate Center

3:35

where they train chimpanzees to cooperate.

3:38

["1937"] So this is already about a hundred years ago

3:41

that we were doing experiments on cooperation.

3:44

What you have here is two young chimpanzees who have a box,

3:47

and the box is too heavy for one chimp to pull in.

3:50

And of course, there's food on the box.

3:52

Otherwise they wouldn't be pulling so hard.

3:54

And so they're bringing in the box.

3:56

And you can see that they're synchronized.

3:58

You can see that they work together, they pull at the same moment.

4:01

It's already a big advance over many other animals

4:04

who wouldn't be able to do that.

4:06

And now you're going to get a more interesting picture,

4:08

because now one of the two chimps has been fed.

4:11

So one of the two is not really interested

4:13

in the task anymore.

4:16

(Laughter)

4:23

(Laughter)

4:34

(Laughter)

4:38

[" -- and sometimes appears to convey its wishes and meanings by gestures."]

4:51

Now look at what happens at the very end of this.

4:56

(Laughter)

5:07

He takes basically everything.

5:09

(Laughter)

5:12

So there are two interesting parts about this.

5:14

One is that the chimp on the right

5:16

has a full understanding he needs the partner --

5:18

so a full understanding of the need for cooperation.

5:20

The second one is that the partner is willing to work

5:23

even though he's not interested in the food.

5:25

Why would that be? Well that probably has to do with reciprocity.

5:28

There's actually a lot of evidence in primates and other animals

5:30

that they return favors.

5:32

So he will get a return favor

5:34

at some point in the future.

5:36

And so that's how this all operates.

5:38

We do the same task with elephants.

5:40

Now with elephants, it's very dangerous to work with elephants.

5:43

Another problem with elephants

5:45

is that you cannot make an apparatus

5:47

that is too heavy for a single elephant.

5:49

Now you can probably make it,

5:51

but it's going to be a pretty flimsy apparatus I think.

5:53

And so what we did in that case --

5:55

we do these studies in Thailand for Josh Plotnik --

5:58

is we have an apparatus around which there is a rope, a single rope.

6:01

And if you pull on this side of the rope,

6:03

the rope disappears on the other side.

6:05

So two elephants need to pick it up at exactly the same time and pull.

6:08

Otherwise nothing is going to happen

6:10

and the rope disappears.

6:12

And so the first tape you're going to see

6:14

is two elephants who are released together

6:16

arrive at the apparatus.

6:18

The apparatus is on the left with food on it.

6:21

And so they come together, they arrive together,

6:24

they pick it up together and they pull together.

6:26

So it's actually fairly simple for them.

6:30

There they are.

6:39

And so that's how they bring it in.

6:41

But now we're going to make it more difficult.

6:43

Because the whole purpose of this experiment

6:45

is to see how well they understand cooperation.

6:47

Do they understand that as well as the chimps, for example?

6:50

And so what we do in the next step

6:52

is we release one elephant before the other,

6:54

and that elephant needs to be smart enough

6:56

to stay there and wait and not pull at the rope --

6:58

because if he pulls at the rope, it disappears and the whole test is over.

7:01

Now this elephant does something illegal

7:03

that we did not teach it.

7:05

But it shows the understanding that he has,

7:07

because he puts his big foot on the rope,

7:10

stands on the rope and waits there for the other,

7:12

and then the other is going to do all the work for him.

7:15

So it's what we call freeloading.

7:18

(Laughter)

7:20

But it shows the intelligence that the elephants have.

7:23

They develop several of these alternative techniques

7:26

that we did not approve of necessarily.

7:29

So the other elephant is now coming

7:34

and is going to pull it in.

7:53

Now look at the other. The other doesn't forget to eat, of course.

7:56

(Laughter)

8:00

This was the cooperation, reciprocity part.

8:02

Now something on empathy.

8:04

Empathy is my main topic at the moment of research.

8:06

And empathy has sort of two qualities.

8:08

One is the understanding part of it. This is just a regular definition:

8:11

the ability to understand and share the feelings of another.

8:13

And the emotional part.

8:15

And so empathy has basically two channels.

8:17

One is the body channel.

8:19

If you talk with a sad person,

8:21

you're going to adopt a sad expression and a sad posture,

8:24

and before you know it, you feel sad.

8:26

And that's sort of the body channel of emotional empathy,

8:29

which many animals have.

8:31

Your average dog has that also.



8:33

That's actually why people keep mammals in the home

8:35

and not turtles or snakes or something like that

8:37

who don't have that kind of empathy.

8:39

And then there's a cognitive channel,

8:41

which is more that you can take the perspective of somebody else.

8:43

And that's more limited.

8:45

There's few animals -- I think elephants and apes can do that kind of thing --

8:47

but there are very few animals who can do that.

8:50

So synchronization,

8:52

which is part of that whole empathy mechanism

8:54

is a very old one in the animal kingdom.

8:56

And in humans, of course, we can study that

8:58

with yawn contagion.

9:00

Humans yawn when others yawn.

9:02

And it's related to empathy.

9:04

It activates the same areas in the brain.

9:06

Also, we know that people who have a lot of yawn contagion

9:08

are highly empathic.

9:10

People who have problems with empathy, such as autistic children,

9:12

they don't have yawn contagion.

9:14

So it is connected.

9:16

And we study that in our chimpanzees by presenting them with an animated head.

9:19

So that's what you see on the upper-left,

9:21  
an animated head that yawns.  
9:23  
And there's a chimpanzee watching,  
9:25  
an actual real chimpanzee watching a computer screen  
9:28  
on which we play these animations.  
9:35  
(Laughter)  
9:37  
So yawn contagion  
9:39  
that you're probably all familiar with --  
9:41  
and maybe you're going to start yawning soon now --  
9:44  
is something that we share with other animals.  
9:47  
And that's related to that whole body channel of synchronization  
9:50  
that underlies empathy,  
9:52  
and that is universal in the mammals basically.  
9:55  
Now we also study more complex expressions. This is consolation.  
9:58  
This is a male chimpanzee who has lost a fight and he's screaming,  
10:01  
and a juvenile comes over and puts an arm around him  
10:03  
and calms him down.  
10:05  
That's consolation. It's very similar to human consolation.  
10:08  
And consolation behavior,  
10:11  
it's empathy driven.  
10:13  
Actually the way to study empathy in human children  
10:16  
is to instruct a family member to act distressed,  
10:18  
and then they see what young children do.  
10:20  
And so it is related to empathy,

10:22

and that's the kind of expressions we look at.

10:25

We also recently published an experiment you may have heard about.

10:28

It's on altruism and chimpanzees

10:31

where the question is, do chimpanzees care

10:33

about the welfare of somebody else?

10:35

And for decades it had been assumed

10:37

that only humans can do that,

10:39

that only humans worry about the welfare of somebody else.

10:42

Now we did a very simple experiment.

10:44

We do that on chimpanzees that live in Lawrenceville,

10:47

in the field station of Yerkes.

10:49

And so that's how they live.

10:51

And we call them into a room and do experiments with them.

10:54

In this case, we put two chimpanzees side-by-side.

10:56

and one has a bucket full of tokens, and the tokens have different meanings.

10:59

One kind of token feeds only the partner who chooses,

11:02

the other one feeds both of them.

11:04

So this is a study we did with Vicky Horner.

11:08

And here you have the two color tokens.

11:10

So they have a whole bucket full of them.

11:12

And they have to pick one of the two colors.

11:15

You will see how that goes.

11:18

So if this chimp makes the selfish choice,

11:21  
which is the red token in this case,  
11:24  
he needs to give it to us.  
11:26  
So we pick it up, we put it on a table where there's two food rewards,  
11:29  
but in this case only the one on the right gets food.  
11:32  
The one on the left walks away because she knows already  
11:34  
that this is not a good test for her.  
11:37  
Then the next one is the pro-social token.  
11:39  
So the one who makes the choices -- that's the interesting part here --  
11:42  
for the one who makes the choices,  
11:44  
it doesn't really matter.  
11:46  
So she gives us now a pro-social token and both chimps get fed.  
11:49  
So the one who makes the choices always gets a reward.  
11:52  
So it doesn't matter whatsoever.  
11:54  
And she should actually be choosing blindly.  
11:56  
But what we find  
11:58  
is that they prefer the pro-social token.  
12:00  
So this is the 50 percent line that's the random expectation.  
12:03  
And especially if the partner draws attention to itself, they choose more.  
12:06  
And if the partner puts pressure on them --  
12:09  
so if the partner starts spitting water and intimidating them --  
12:12  
then the choices go down.  
12:15  
It's as if they're saying,  
12:17  
"If you're not behaving, I'm not going to be pro-social today."

12:19

And this is what happens without a partner,

12:21

when there's no partner sitting there.

12:23

And so we found that the chimpanzees do care

12:25

about the well-being of somebody else --

12:27

especially, these are other members of their own group.

12:30

So the final experiment that I want to mention to you

12:33

is our fairness study.

12:35

And so this became a very famous study.

12:38

And there's now many more,

12:40

because after we did this about 10 years ago,

12:42

it became very well known.

12:44

And we did that originally with capuchin monkeys.

12:46

And I'm going to show you the first experiment that we did.

12:49

It has now been done with dogs and with birds

12:52

and with chimpanzees.

12:54

But with Sarah Brosnan we started out with capuchin monkeys.

12:58

So what we did

13:00

is we put two capuchin monkeys side-by-side.

13:02

Again, these animals, they live in a group, they know each other.

13:04

We take them out of the group, put them in a test chamber.

13:07

And there's a very simple task

13:09

that they need to do.

13:11

And if you give both of them cucumber for the task,

13:14  
the two monkeys side-by-side,  
13:16  
they're perfectly willing to do this 25 times in a row.  
13:18  
So cucumber, even though it's only really water in my opinion,  
13:22  
but cucumber is perfectly fine for them.  
13:25  
Now if you give the partner grapes --  
13:28  
the food preferences of my capuchin monkeys  
13:30  
correspond exactly with the prices in the supermarket --  
13:33  
and so if you give them grapes -- it's a far better food --  
13:36  
then you create inequity between them.  
13:39  
So that's the experiment we did.  
13:41  
Recently, we videotaped it with new monkeys who'd never done the task,  
13:44  
thinking that maybe they would have a stronger reaction,  
13:46  
and that turned out to be right.  
13:48  
The one on the left is the monkey who gets cucumber.  
13:50  
The one on the right is the one who gets grapes.  
13:53  
The one who gets cucumber,  
13:55  
note that the first piece of cucumber is perfectly fine.  
13:57  
The first piece she eats.  
14:00  
Then she sees the other one getting grape, and you will see what happens.  
14:03  
So she gives a rock to us. That's the task.  
14:06  
And we give her a piece of cucumber and she eats it.  
14:09  
The other one needs to give a rock to us.  
14:12  
And that's what she does.

14:15

And she gets a grape and she eats it.

14:18

The other one sees that.

14:20

She gives a rock to us now,

14:22

gets, again, cucumber.

14:27

(Laughter)

14:42

She tests a rock now against the wall.

14:45

She needs to give it to us.

14:47

And she gets cucumber again.

14:52

(Laughter)

14:58

So this is basically the Wall Street protest that you see here.

15:02

(Laughter)

15:05

(Applause)

15:08

Let me tell you --

15:10

I still have two minutes left, let me tell you a funny story about this.

15:12

This study became very famous

15:14

and we got a lot of comments,

15:16

especially anthropologists, economists,

15:18

philosophers.

15:20

They didn't like this at all.

15:22

Because they had decided in their minds, I believe,

15:25

that fairness is a very complex issue

15:27

and that animals cannot have it.

15:29

And so one philosopher even wrote us

15:31

that it was impossible that monkeys had a sense of fairness

15:34

because fairness was invented during the French Revolution.

15:37

(Laughter)

15:39

Now another one wrote a whole chapter

15:42

saying that he would believe it had something to do with fairness

15:46

if the one who got grapes would refuse the grapes.

15:48

Now the funny thing is that Sarah Brosnan,

15:50

who's been doing this with chimpanzees,

15:52

had a couple of combinations of chimpanzees

15:54

where, indeed, the one who would get the grape would refuse the grape

15:57

until the other guy also got a grape.

15:59

So we're getting very close to the human sense of fairness.

16:02

And I think philosophers need to rethink their philosophy for a while.

16:06

So let me summarize.

16:08

I believe there's an evolved morality.

16:10

I think morality is much more than what I've been talking about,

16:12

but it would be impossible without these ingredients

16:15

that we find in other primates,

16:17

which are empathy and consolation,

16:19

pro-social tendencies and reciprocity and a sense of fairness.

16:22

And so we work on these particular issues

16:25

to see if we can create a morality from the bottom up, so to speak,

16:28

without necessarily God and religion involved,



16:30

and to see how we can get to an evolved morality.

16:33

And I thank you for your attention.

16:36

(Applause)