We all know that trust is fundamental, but when it comes to trusting people, something serious happens.

Raise your hand if you've ever been an Airbnb host or guest.

oh. it's a lot of you.

Who Owns Bitcoin?

still a lot of people. OK.

Raise your hand if you've ever used Tinder to find a spouse.

(Laughter) This is really hard to count because you feel like this.

(Laughter) These are all examples of how technology is creating new mechanisms that allow us to trust unknown people, companies, and ideas.

But at the same time, trust in institutions such as banks, governments and even churches is collapsing.

So what's going on here and who do you trust?

Let's start with a platform or company in France with a rather funny-sounding name BlaBlaCar.

A platform that matches drivers and passengers who want to travel long distances together.

The average distance traveled is 320 kilometers.

Therefore, we advise you to choose your companions wisely.

Social profiles and reviews help people make choices.

You can see if someone smokes, what kind of music they like, or if they take their dog for a drive.

But it turns out that an important social identifier is how much you talk in your car.

(Laughter) Somehow, not too many, somehow, I'd like to chat a little bit, but somehow, I can't stop chatting all the way from London to Paris.

(Laughter) It's amazing how this idea works. Because this goes against the lesson most of us were taught in childhood: "Don't get in the car with people you don't know."

Still, BlaBlaCar transports over 4 million people each month.

To put this in context, that's more passengers than Eurostar or JetBlue carries.

BlaBlaCar beautifully showcases how technology is enabling leaps of trust for millions of people around the world.

Leaps of trust happen when we take the risk of doing something new or different from what we've always done.

Let's visualize this together.

OK. I want you to close your eyes.

There is a man staring at me with his eyes wide open.

I am in this big red circle. i can see.

So please close your eyes.

(Laughter) (Applause) We'll do it together.

And I want you to imagine that there is a gap between you and the unknown.

That unknown person could be someone you just met.

It may be a place you have never been to.

It may be something you have never tried before.

I got it?

OK. It's okay to open your eyes now.

Jumping out of a certain place and betting on someone or something unknown requires power over gaps, and that amazing power is trust.

Trust is an elusive concept, but we rely on it to run our lives.

When my kids say they turn off the lights at night, I trust them.

I trusted the pilot who flew me here to keep me safe.

This is a word we use so often without constantly thinking about what it really means and how it works in different situations in our lives.

In fact, there are hundreds of definitions of trust, most of which come down to some sort of risk assessment of how likely things are to work out.

But I don't like this definition of trust. Because trust sounds rational and predictable in this definition, it essentially fails to understand the human nature of what it enables us to do and how it enables us to connect with other people.

So I define trust a little differently.

I define trust as a confident relationship with the unknown.

Now, looking at trust through this lens begins to explain why it has a unique ability to allow us to deal with uncertainty, trust strangers, and keep moving forward.

Humans excel at leaps of trust.

Remember the first time you entered your credit card details into a website?

It's a leap of faith.

I distinctly remember telling my dad that I wanted to buy a used navy blue Peugeot on eBay. That's when my dad rightly pointed out that the seller's name was "Invisible Wizard" and that was probably not a very good idea.

(Laughter) My work, my research, is focused on how technology is changing the social cohesion of society, the trust between people. It's an interesting area to research because there's still a lot we don't know.

For example, do men and women trust differently in digital environments?

Do the ways you build trust face-to-face translate online?

Will the trust be transferred?

So if you trust finding a match on Tinder, are you more likely to trust finding a ride on BlaBlaCar?

But after studying hundreds of networks and markets, there is a common pattern that people follow, which I call "climbing the trust stack."

Let's bring this to life, using BlaBlaCar as an example.

At the first level you have to trust the idea.

So you have to believe in the idea that ridesharing is safe and worth trying.

The second level is that you have confidence in your platform and if something goes wrong BlaBlaCar will help you.

And the third level is using a little bit of information to decide if the other person is trustworthy.

Now, climbing the trust stack for the first time feels strange and even dangerous, but you get to a point where these thoughts seem perfectly normal.

Our behavior often changes relatively quickly.

In other words, trust enables change and innovation.

So the idea that intrigued me, and I would like you to consider, is whether the great waves of individual turmoil and change in society can be better understood through the lens of trust.

Well, it turns out that trust has only evolved in three key chapters in human history: localized, organized, and decentralized, which we are now entering.

So for a long time, until the mid-1800s, trust was built around close relationships.

For example, let's say I live in a village with the first five rows of this audience, and we all know each other and want to borrow money.

The wide-eyed man might lend it to me, and you know I'm a dangerous person if I don't give it back to him.

My reputation will be damaged and you will refuse to do business with me in the future.

Trust was largely local and based on accountability.

In the mid-nineteenth century, society experienced great changes.

People moved to fast-growing cities like London and San Francisco, and local bankers were replaced by big corporations who don't know us personally.

We put our trust more in black box authoritative systems such as legal contracts, regulations, and insurance, and less in direct trust in other people.

Trust has become institutional and fee-based.

It is widely talked about that trust in institutions and many corporate brands has been steadily declining and will continue to decline.

I am constantly amazed by major breaches of trust, such as the News Corp phone hack, the Volkswagen emissions scandal, the widespread abuses in the Catholic Church, the fact that only one small banker was imprisoned after the Great Financial Crisis, or, more recently, the Panama Papers exposing how the wealthy can abuse offshore taxation.

And what really surprised me is why is it so difficult for leaders to apologize, to sincerely apologize when trust is broken?

It would be easy to conclude that institutional trust is not working because we are fed up with the sheer boldness of disloyal elites, but what is happening now runs deeper than pervasive questions about the size and structure of institutions.

We are beginning to realize that institutional trust was not designed for the digital age.

The conventions of how trust is built, managed, lost and repaired across brands, leaders and systems are being turned upside down.

This is interesting, but also terrifying. Because many of us have to rethink how trust is built and broken with customers, employees, and even loved ones.

The other day, I was talking to the CEO of a major international hotel brand, and as usual, Airbnb came up.

And he admitted to me that he was embarrassed by their success.

He was baffled how a company that relies on the willingness of strangers to trust each other could operate so well in 191 countries.

So I told him I had a confession to make, and he looked at me with a bit of a puzzled look and said - and I'm sure many of you do the same - I don't always like to hang towels after work in a hotel, but as an Airbnb guest, I never do.

And the reason I never do this as an Airbnb guest is that guests know they will be rated by their hosts, and that rating can affect their ability to trade in the future.

This simply shows how online trust changes our behavior in the real world, increasing our accountability in ways we still can't imagine.

I'm not saying we don't need hotels and traditional authorities.

What we cannot deny, however, is that the way trust flows into society is changing, creating a profound shift from a 20th century defined by institutional trust to a 21st century facilitated by decentralized trust.

Trust is no longer top-down.

It is bundled and inverted.

No longer opaque and linear.

A new recipe for trust, again distributed among people and based on accountability, is emerging.

And this change will be further accelerated by the emergence of blockchain, the revolutionary ledger technology that underpins Bitcoin.

To be honest, it's amazing to understand how blockchain works.

One reason for that is that it involves dealing with rather complex concepts with terrible names.

So, the cryptographic algorithms and hash functions, and the people called miners who verify transactions – all of this was created by a mysterious person called Satoshi Nakamoto.

Now, this is a big confidence leap that hasn't happened yet.

(Applause.) But imagine this.

So The Economist eloquently described blockchain as a great chain of beliefs.

The easiest way to describe this is to imagine a block as a spreadsheet filled with assets.

So it could be a property title.

It could be stock trading.

It can be a creative asset, such as the rights to a song.

Every time something moves from one location on the registry to another, that asset movement is time-stamped and publicly recorded on the blockchain.

It's that simple. right.

So the real implication of blockchain is to eliminate the need for any kind of third party, such as lawyers, trusted intermediaries, or perhaps even government intermediaries, to facilitate exchanges.

So, going back to the trust stack, you still have to trust the idea and trust the platform, but you don't have to trust others in the traditional sense.

The impact is huge.

Blockchain will revolutionize trust on a global scale, just as the internet has opened the door to an era of universal access to information.

Now, I deliberately waited until the end to mention Uber because I recognize that this is a controversial and widely overused example. But in the context of the new age of trust, this is a great case study.

Next, we'll look at an example of distributed trust abuse.

We've already seen this, but it can go horribly wrong.

It is no surprise that there are protests from taxi associations around the world who want governments to ban Uber based on claims that it is unsafe.

I happened to be in London on the day of these protests and stumbled upon a tweet by British Commerce Minister Matt Hancock.

And he wrote, "Anyone know more about this #Uber app everyone's talking about?"

(laughs) I had never heard of it until today. ”

Well, the taxi association justified the first layer of the trust stack.

They justified the idea they were trying to eliminate, and registrations increased by 850% in 24 hours.

Now, this is a very strong example of how once a shift in trust has taken place regarding a behavior or an entire sector, the story cannot be undone.

Every day, 5 million people will take the trust leap and ride Uber.

In China, 11 million rides are made every day on ride-hailing platform Didi.

This equates to 127 rides per second, indicating that this is a cross-cultural phenomenon.

And what's interesting is that both drivers and passengers report feeling more secure when they see names, photos of people, and their ratings, and that, as you may have experienced, they behave a little better in taxis.

Uber and Didi are early but powerful examples of how technology is creating trust among people in a way and scale never before possible.

Today, many of us are comfortable getting into a car driven by a stranger.

Swipe right to meet a match.

We share our homes with people we don't know.

This is just the beginning, as the real mess going on isn't technical.

It's a change in trust, and I want to help people understand this new era of trust, get it right, and take advantage of the opportunity to redesign the system to be more transparent, inclusive and accountable.

thank you very much.

(Applause.) Thank you.

(applause)

Please meet Jane.

She has a high-risk pregnancy.

Within 24 weeks, she will be on bed rest at the hospital and monitored for extrasystoles.

She doesn't look very happy.

Part of the reason is that this clunky belt needs to be put on her by a technician or specialist to monitor her contractions.

Another reason Jane is not very happy is that she is worried.

In particular, he is worried about what will happen after 10 days of hospital bed rest.

What happens when she's home?

Giving birth so early would be a big deal.

As an African-American woman, she is twice as likely to give birth prematurely or still.

So Jane basically has one of two options. One is to stay in bed, be addicted to technology until you give birth, and then spend the rest of your life paying off. Or you're home after a 10-day stay and wish you luck.

Neither of these two options seem appealing.

As I thought about stories like this and heard stories like this, I started asking myself questions and imagining. "Is there an alternative?"

Is there a way for someone to enjoy the benefits of a trusted partner in the hospital and the high-fidelity monitoring they get while they go about their daily routines at home?

With that in mind, I encouraged people in my research group to partner with a smart materials scientist, and we all got together and brainstormed.

After a long process, we came up with a vision, an idea, of a wearable system that you can wear like jewelry or apply to yourself like a band-aid.

And after a lot of trial and error and years of hard work, we were able to come up with this flexible electronic patch. This flexible electronic patch is manufactured using the same process used to make computer chips, except that the electronics are transferred from a semiconductor wafer to a flexible material that can connect with the human body.

These systems are about the thickness of a human hair.

These can measure the types of information we need, such as body movement, body temperature, and the body's electrical rhythms.

We can also design these systems to integrate energy sources or have wireless transmission capabilities.

So when we started building this kind of system, our research group started testing it ourselves.

But then we reached out to some of our clinical partners in San Diego and started testing these on different patients with different clinical conditions, including future mothers like Jane.

Here is a picture of a pregnant woman in labor using a conventional belt to monitor uterine contractions at a university hospital.

Plus, our flexible electronic patch is there.

This picture shows waveforms related to fetal heart rate. Red corresponds to those obtained with conventional belts and blue corresponds to estimates using our flexible electronic systems and algorithms.

At this moment, we gave a big high five in our hearts.

Some of the things we envisioned are starting to come true, and we're seeing it in clinical practice.

However, there was still a problem.

The problem was that the manufacturing methods for these systems were highly inefficient, yielded poorly, and were highly error prone.

Additionally, after speaking with several hospital nurses, they recommended making sure our electronics work with common medical adhesives used in hospitals.

We thought, 'Wait a minute.

Incorporating it into the adhesive, instead of just making it work, could solve the manufacturing problem. ”

The photo shown here demonstrates our ability to embed the sensor inside the cellophane tape by simply peeling the cellophane tape from the wafer.

Ongoing research in our research group will also enable the embedding of integrated circuits in flexible adhesives for signal amplification, digitization, processing, and encoding for wireless transmission.

All of this is integrated into the same medical adhesive used in hospitals.

So when we got to this point, there were some other challenges, both from an engineering and usability standpoint, to make it really usable.

In many digital health discussions, people believe and accept the idea that data can be easily digitized, transmitted wirelessly, and sent to the cloud, where meaningful information can be extracted for interpretation.

And indeed, all this can be done without worrying about some energy issues.

Think about Jane for a moment.

She doesn't live in Palo Alto or Beverly Hills.

What this means is that we need to be careful about her data plan and how much it costs her to send a continuous stream of data.

There is another challenge that none of the medical professionals are comfortable talking about.

It's that Jane has the least trust in medical institutions.

Neither she nor people like her nor her ancestors had the best experience at the hands of doctors, hospitals and insurance companies.

In other words, you have to be careful about privacy issues.

Jane may not be so happy with all her data being processed in the cloud.

And Jane is not fooled. she reads the news

She knows that if the federal government can hack, if Fortune 500 companies can hack, so can doctors.

With that in mind, we had an epiphany.

We can't beat all the hackers in the world, but we can probably present them with a smaller target.

In fact, instead of running the algorithms that do the data interpretation in the cloud, what if you could run them on tiny integrated circuits embedded in glue?

Put these things together, and what this means is that we can think of a future where someone like Jane can continue to live a normal day-to-day life, be monitored, in a way that doesn't require her to take another job to pay for her data plan, and address some of her privacy concerns as well.

So at the moment we are feeling very good about ourselves.

We have achieved this and have begun to address some privacy questions. I feel like I'm almost done with that chapter.

We all lived happily ever after, right?

Well, not so fast.

(Laughter) One of the things we have to remember is, as I said earlier, Jane has the least trust in medical institutions.

We must not forget that health disparities are increasing and that there are inequities in terms of proper care management.

What this means is that even if she's used to this simple picture of Jane and her data being sent wirelessly to the cloud with medical intervention if needed, it's not all.

So what we're starting to think about is how to get trusted parties to act as intermediaries between people like Jane and healthcare providers.

For example, we are partnering with churches and beginning to think of nurses who are members of the church and belong to a trusted community as advocates for patients and health mentors for people like Jane.

Another thing we hope is that insurers will find some of these ideas more and more attractive.

They are increasingly realizing that it might be better to pay $1 now for wearable devices and health coaches than $10 when a baby is born prematurely and ends up in one of the most expensive places in a hospital: the neonatal intensive care unit.

This has been a long learning process for us.

This iterative process of breaking through and attacking one problem, not feeling completely comfortable, and identifying the next, really helped us on this path of not only innovating with this technology, but also making sure it was available to those who probably needed it most.

Another lesson we've learned from this process is a very humbling one: as technology advances at an accelerating rate, we must remember that it is humans who are using this technology, and we must keep in mind that humans have faces, names, and lives.

For Jane, preferably two.

thank you.

(applause)

So I started my first job as a computer programmer in my first year of college, when I was a teenager.

As soon as I started writing software and working for a company, a manager who worked for that company came up to me and whispered to me, "Will he know if I'm lying?"

There was no one else in the room.

"Who knows you're lying? And why are we whispering?"

The manager pointed to the computer in the room.

"Will he know if I'm lying?"

Well, the manager was having an affair with the receptionist.

(laughs) And I was still a teenager.

So I whispered back to him. "Yes, the computer can tell if you are lying."

(Laughter) Well, I laughed, but actually the laughter was mine.

Computing systems now exist that can infer emotional states and even lies by processing human faces.

Advertisers and even governments are very interested.

I became a computer programmer because I was one of those kids who loved math and science.

However, at some point I learned about nuclear weapons and began to think seriously about the ethics of science.

I'm in trouble.

However, due to family circumstances, I also needed to start working as soon as possible.

So I decided to choose a technical field where it would be easier to get a job and not have to deal with ethical complications.

So I chose a computer.

(laughs) Well, hahahahaha! All the laughter is on me.

Computer scientists are now building platforms that control what a billion people see every day.

They are developing a car that can decide who to run over.

They even build machines and weapons that can kill humans in war.

It's all about ethics.

Machine intelligence is here.

We are now using computers to make all kinds of decisions, as well as new kinds of decisions.

We ask computationally subjective, open-ended, and value-rich questions without a single correct answer.

We ask questions like, "Who should a company hire?"

"Which updates from which friends should I show?"

“Which inmates are more likely to reoffend?”

"What news or movies should I recommend to people?"

Well, we've been using computers for a while, but this is different.

This is a historical twist. Because you can't fix the calculations for such subjective decisions any more than you can fix the calculations for flying a plane or building a bridge or going to the moon.

Are planes safer? Did the bridge sway and fall?

There, we have agreed-upon, fairly well-defined benchmarks, and natural laws to guide us.

We have no such grounds or standards for decision-making in sticky personnel matters.

To make things even more complicated, our software is getting more powerful, but at the same time less transparent and more complex.

Recently, in the past decade, complex algorithms have made great strides.

They can recognize human faces.

They can decipher handwriting.

It can detect credit card fraud, block spam, and translate between languages.

Tumors can be detected in medical images.

They can beat humans at chess and Go.

Much of this progress is due to a technique called "machine learning."

Machine learning is different from traditional programming, which gives computers detailed, precise, and painstaking instructions.

It's more like feeding systems with a lot of data, including unstructured data like the ones we generate in our digital lives.

And the system learns by shuffling this data.

Also, importantly, these systems do not operate on single-answer logic.

I don't get a simple answer. it is more probabilistic. "This is probably similar to what you're looking for."

Well, the advantage is that this method is very powerful.

Google's AI systems chief called this "unreasonable validity of data."

The downside is that you can't really understand what the system has learned.

In fact, that is its power.

This is different from giving instructions to a computer. It's rather like training a mechanical creature like a puppy that we can't really understand or control.

This is our problem.

When this artificial intelligence system makes a problem, it becomes a problem.

If it's a subjective problem, you don't even know which is which, so it's also a problem when things get right.

We don't know what this guy is thinking.

So let's think about hiring algorithms, i.e. systems used to hire people using machine learning systems.

Such a system would have been trained on previous employee data and instructed to find and hire talent like the existing top talent within the company.

Sounds good.

I once attended a conference where HR managers, executives, and other senior executives were using systems like this for their hiring.

they were very excited.

They believed that this would make recruitment more objective and less biased, giving women and minorities an advantage over biased human managers.

And look, human recruitment is biased.

know.

So in one of my early jobs as a programmer, my direct manager would sometimes come to where I was early in the morning or late in the afternoon and say, "Zeinep, let's go to lunch!"

It's confusing at odd times.

It's 4pm. lunch?

I didn't have any money, so I had a free lunch. I used to go there all the time.

I found out what was going on later.

My direct supervisors didn't tell upper management that the programmers they hired for serious work were teenage girls who wore jeans and sneakers to work.

I had a good job, but I looked wrong, I was the wrong age and the wrong gender.

So employment without gender or race certainly seems like a good thing.

However, for these systems, the process becomes more complex. Here's why. Computer systems can now infer all sorts of information about you from your digital bread crumbs, even if you don't disclose it.

They can infer your sexual orientation, personality traits, and political leanings.

They have predictive power with a high level of accuracy.

Remember -- what you haven't even disclosed.

This is speculation.

A friend of mine developed a computational system that predicted the likelihood of clinical and postpartum depression from social media data.

The results were astonishing.

Her system can predict possible depression months before symptoms appear.

There are no symptoms, but there are predictions.

She hopes it will be used for early intervention. wonderful!

But let's put this in the context of employment.

So, at this HR management meeting, I consulted with a senior executive at a very large company and said: “What if your system excludes people who are likely to become depressed in the future without your knowledge?”

They're not depressed now, but they're probably more likely to be depressed in the future.

What if we were to exclude women who are likely to become pregnant in the next year or two, but are not currently pregnant?

What if you're hiring aggressive people because that's your workplace culture? ”

You can't tell by looking at the gender breakdown.

They may be balanced.

And because this is machine learning, not traditional coding, there are no variables labeled "higher risk of depression," "higher risk of pregnancy," or "aggressive male scale."

Not only do I not know what the system is choosing, I don't even know where to start looking.

it's a black box.

You have precognition, but you don't understand it.

"What kind of safety measures are there?" I asked. "Is it necessary to check if the black box is doing something suspicious?"

She looked at me as if I had stepped on ten puppy tails.

(Laughter) She looked at me and said, "I don't want to hear anything more about this."

Then she turned and left.

Mind you, she was not rude.

It was clearly, 'It's not my problem what I don't know, go away and stare at death'.

(Laughter.) You see, such a system might in some ways be less biased than a human administrator.

And it can also be financially reasonable.

But it could also lead to a steady but stealthy exclusion of people at high risk of depression from the job market.

Is this the kind of society we want to build without knowing it because we have entrusted decision-making to machines we cannot fully comprehend?

Another problem is that these systems are often trained on data generated by human behavior, or human footprints.

Well, they may simply reflect our biases, or these systems may be sensing and amplifying our biases and showing us them while we tell ourselves, "We're just making objective, neutral calculations."

Researchers found that women were less likely than men to see job ads for high-paying jobs on Google.

Also, if you search for African-American names, you're more likely to see ads suggesting that you have a criminal record, even if you don't have one.

These hidden biases and black-box algorithms, which researchers sometimes discover and sometimes we don't, can have life-changing consequences.

In Wisconsin, a defendant who fled police was sentenced to six years in prison.

In case you didn't know, algorithms are increasingly being used in parole and sentencing decisions.

He wanted to know how this score was calculated.

It's a commercial black box.

The company has refused to challenge its algorithms in public court.

But the research nonprofit ProPublica audited just that algorithm with available public data and found its results to be biased, its predictive power dismal, barely better than chance, and falsely labeling black defendants as future criminals twice as often as white defendants.

So let's consider the following case. The woman was running down the street with a friend after being late to pick up her godsister from her school in Broward County, Florida.

They found an unlocked children's bike and scooter on their doorstep and foolishly jumped on it.

As they were speeding away, a woman came out and said, "Hey! That's my kid's bike!"

They dropped it, walked away, and were arrested.

She was wrong, stupid, but she was only 18.

She had some juvenile delinquency.

Meanwhile, the man had been arrested for shoplifting $85 worth of items at a hardware store, a similar misdemeanor.

However, he had two previous armed robbery convictions.

But the algorithm scored her as high risk, not him.

Two years later, ProPublica found she hadn't reoffended.

It was hard to find a job with her track record.

Meanwhile, he committed a repeat offense and is currently serving eight years in prison for a later offense.

Clearly, we need to audit the black boxes and make sure they don't have such unruly powers.

(Applause.) Audits are wonderfully important, but they don't solve all problems.

Consider Facebook's powerful news feed algorithm. As you know, this algorithm ranks everything and decides what to show from all the friends and pages you follow.

Would you like me to show you the baby picture again?

(Laughter) Moody notes from acquaintances?

An important but difficult news item?

There is no correct answer.

Facebook optimizes engagement (likes, shares, comments) on the site.

In August 2014, protests erupted under uncertain circumstances in Ferguson, Missouri, following the killing of an African-American teenager by a white police officer.

News of the protests was all over my Twitter feed, unfiltered by algorithms, but nowhere on Facebook.

Was it my Facebook friend?

I disabled Facebook's algorithm. This is difficult because Facebook wants to keep users under the control of its algorithms. And I saw my friends talking about it.

It's just that the algorithm didn't show me that.

After researching this, I found that this is a widespread problem.

Ferguson's story was not algorithm-friendly.

It's not "likeable".

Who will click Like?

It's also not easy to comment.

Without likes and comments, the algorithm could have made it visible to even fewer people, so we couldn't see this.

Instead, that week, Facebook's algorithm focused on this one, the ALS Ice Bucket Challenge.

worthy cause. Throw away the ice water, donate to charity, fine.

But it was very algorithm friendly.

A machine made this decision for us.

A very important but difficult conversation might have been hidden if Facebook was the only channel.

Now, finally, these systems can also be wrong in that they are not like human systems.

Remember Watson, IBM's machine intelligence system that swept the floor with human contestants in Jeopardy?

He was a great player.

But then, in The Final Jeopardy, Watson was asked: "Its largest airport is named after a World War II hero and is the second largest airport in a World War II battle."

(Music by Hummus Final Jeopardy) Chicago.

Two humans got it right.

Watson, on the other hand, answered "Toronto" as a category for cities in the United States.

This impressive system made mistakes that no human would ever make, not even an 8th grader would make.

Our machine intelligence can fail in ways that don't fit human error patterns, ways that we may not expect or be prepared for.

Not getting the right job sucks, but if it's because of a subroutine stack overflow, it's triple bad.

(laughter) In May of 2010, a flash crash on Wall Street caused by a feedback loop in Wall Street's "sell" algorithm wiped out $1 trillion worth in 36 minutes.

I don't even want to think about what "error" means in the context of lethal autonomous weapons.

Yes, humans have always been prejudiced.

Decision makers and gatekeepers in courts, news and war...

they make mistakes. But that's exactly my point.

We cannot escape these difficult questions.

We cannot outsource our responsibilities to machines.

(Applause.) Artificial intelligence doesn't give us a card that says, "Let's get out of ethics at will."

Data scientist Fred Benenson calls this math cleaning.

We need the opposite.

We need more suspicion, scrutiny, and investigation of algorithms.

We need to ensure algorithmic accountability, audit and meaningful transparency.

We have to accept that bringing mathematics and calculations into complex, value-filled relationships does not bring objectivity. Rather, the complexities of human relationships invade the algorithm.

Yes, you can and should use math to make better decisions.

But we need to acknowledge our moral responsibility for judgment and use algorithms within that framework, and not as a means of delegating and mutually delegating responsibility as human-to-human.

Machine intelligence is here.

It means we must adhere to human values ​​and human ethics more than ever.

thank you.

(applause)

Today, I am standing in front of you as a man who lives here to the fullest.

But for a long time I lived to die.

I was a young man who believed that jihad should be understood in terms of force and violence.

I tried to right the wrong with power and aggression.

I had a deep concern for the suffering of others and a strong desire to help them and bring relief.

I thought violent jihad was noble, chivalrous, and the best way to help people.

When so many people in our country, especially our youth, are at risk of radicalization through groups such as Al-Qaeda and Islamic State, and when these groups claim that their horrific atrocities and violence are true jihad, I want to say that their idea of ​​jihad is wrong, just like mine, completely wrong.

Jihad means doing all you can.

It involves effort and spirituality, self-purification and dedication.

It refers to positive change through learning, wisdom, and remembering God.

The word jihad sums up all these meanings.

Jihad may sometimes take the form of warfare, but only under strict conditions and within rules and restrictions.

In Islam, the benefits of an action must outweigh the harm and difficulties it entails.

More importantly, the Quran's verses relating to holy wars and battles do not override verses that speak of forgiveness, mercy and patience.

But now I believe there is no situation on earth where violent jihad is acceptable. Because it does more harm.

But now the concept of jihad has been hijacked.

It has been twisted to mean violent struggle wherever Muslims are in trouble, and turned into terrorism by fascist Islamists such as Al-Qaeda and Islamic State.

However, I have come to understand that true jihad is about doing our utmost to strengthen and practice the qualities that God loves: honesty, trustworthiness, compassion, mercy, trustworthiness, respect and integrity – human values ​​shared by many of us.

I was born in Bangladesh but mostly raised in England.

And I used to go to school here.

My father is an academic and we were in the UK on his job.

In 1971 we were in Bangladesh and everything changed.

The War of Independence had a great impact on us, causing strife between family and family, neighbor and neighbor.

And at the age of 12, I went through the war, the poverty of my family, the death of 22 relatives in horrific ways, and the murder of my brother.

I witnessed the murder scene...

Animals eating corpses on the streets, hunger around us, irrational violence, irrational violence.

I was still a teenager and fascinated by ideas.

I wanted to learn, but I couldn't go to school for four years.

After the Revolutionary War, my father was put in prison for two and a half years, and I visited him every week and homeschooled him.

My father was released in 1973 and fled to England as a refugee. We immediately followed him.

I was seventeen.

So these experiences gave me a keen awareness of the cruelty and injustice in the world.

And I had a strong desire, a very keen and deep desire to right wrongs and help victims of oppression.

While studying at university in the UK, I met people who communicated their aspirations through religion and taught me how I could help.

And I became radicalized, thinking that violence is right, even a virtue in certain circumstances.

So I got involved in the Afghanistan jihad.

I wanted to protect the Muslim Afghan people from the Soviet army.

And I thought it was jihad, my sacred duty that would be rewarded by God.

I became a preacher.

I was one of the pioneers of violent crusade in Britain.

I recruited, funded, trained.

I confused true jihad with the perversity still perpetuated today by fascist-Islamists, those who use the idea of ​​​​jihad to justify their desire for power, authority and domination on earth, fascist-Islamic groups such as Al Qaeda and Islamic State.

For about 15 years, I fought briefly in Kashmir and Burma, as well as Afghanistan.

Our aim was to eliminate the invaders, relieve the oppressed victims and, of course, establish the Islamic State, the Caliphate for God's rule.

And I did this openly.

I am not breaking any law.

I was proud and grateful to be British – and still am.

And I have never, and still do not have, hostility towards this country or my country, nor towards non-Muslim citizens.

During the fighting in Afghanistan, some British men and I formed a special bond with Abdullah, a 15-year-old Afghan boy. Abdullah was an innocent, loving, and loving boy who always wanted to please others.

he was poor

And boys like him did menial work in camps.

And although he looked very happy, I couldn't help but wonder—his parents must have missed him dearly.

And they must have dreamed of a better future for him.

Victims caught up in the war and brutally confronted by the harsh conditions of the time.

One day I picked up this unexploded mortar round in a trench and deposited it in a makeshift mud hut lab.

And I went out for short, pointless skirmishes—always pointless, and when I came back a few hours later I found him dead.

He was trying to retrieve the explosives from the shell.

It exploded and he was blown to a violent death by the very same device that turned out to be harmless to me.

That's where I started to question.

What purpose did his death serve?

Why did he die and I live?

I continued.

fought in Kashmir.

We also recruited in the Philippines, Bosnia and Chechnya.

And questions grew.

Later, in Burma, I met teenage Rohingya fighters born and raised in the jungle with machine guns and grenade launchers.

I met two soft-spoken, soft-spoken 13-year-old boys.

They saw me and begged me to take them to England.

They just wanted to go to school - that was their dream.

My family, children my age, lived in England at home, went to school, and had a safe life.

And I couldn't help but wonder how these boys must have talked to each other about their dreams for such a life.

Victims of Circumstances: These two boys, cynically exploited by their leaders for their personal lust for glory and power, slept rough on the ground and stared up at the stars.

I soon witnessed boys like them killing each other in conflicts between rival groups.

And it was the same everywhere...

Afghanistan, Kashmir, Burma, Philippines, Chechnya. Small warlords slaughtered young and vulnerable people in the name of jihad.

Muslim vs Muslim.

No one defends against invaders and occupiers. Bring no relief to the oppressed.

Children are exploited and cynically exploited. Those who died in the conflicts I supported in the name of jihad.

And it continues to this day.

Realizing that the violent crusade I was engaged in abroad was so different, that there was such a gap between what I experienced and what I thought was a sacred duty, I had to reflect on my work here in England.

I had to consider my preaching, recruiting, fundraising, training, and most importantly, the radicalization — making young people fight and die just like me — all completely wrong.

So I took part in a violent jihad, starting in Afghanistan in the mid-80s.

And when it was completed, it was 2000.

I was completely immersed.

All around me, people supported, applauded, and even celebrated what we were doing in their name.

But in 2000, 15 years had passed when I was completely disillusioned and learned how to get out.

So what could go wrong?

We were busy talking about virtue and blind about cause.

And we have not given ourselves the chance to develop a virtuous character.

We told ourselves we were fighting for the oppressed, but these were wars we could not win.

We have become the very tools that contribute to more misery and cause more deaths for the selfish benefit of a brutal minority.

So after a long time, I opened my eyes.

I dared to face the truth, to think, to face the tough questions.

I got in touch with my soul.

What have I learned?

Those who engage in violent jihadism, those who are attracted to this kind of extremism, are not so different from others.

But I believe that people like that can change.

They can heal and restore their hearts by filling them with human values.

When we ignore reality, we find ourselves accepting what we are told without critical reflection.

And many of us neglect the gifts and benefits we want to cherish even if it's just for a moment in our lives.

I did what I thought was right.

But now I began to wonder how I knew what I knew.

I kept telling others to accept the truth, but I couldn't put my suspicions in their rightful place.

This conviction that people can change is rooted in my experience, my own journey.

Through extensive reading, reflection, reflection, and self-awareness, I have discovered that our Islamist world and their world are false and unjust.

Considering the uncertainty, the inviolable truth, the undisputed truth of all that we have been arguing for, we have developed a more nuanced understanding.

In a world full of change and contradiction, I have found that only stupid preachers, stupid preachers like myself once upon a time, feel no contradiction in the myths and fictions they use to claim their authenticity.

There, I understood the importance of self-awareness, political awareness, and the need for a deeper and broader understanding of our commitments and actions and how they affect others.

So today, I ask all of you, especially those who truly believe in Islam jihadism...

Reject arbitrary authority. Let go of anger, hatred and violence. Learn how to right wrongs without even trying to justify cruel, unjust and wasteful acts.

Instead, create some beautiful and useful things that will outlive us.

Approach the world and life with love.

Learn to develop an eye for goodness, beauty and truth in others and the world.

Then we can take better care of ourselves...

To each other, to our community, and for me to God.

This is jihad - my real jihad.

thank you.

(applause)

In 2015, we witnessed two great and hopeful advances for humanity.

The first is the adoption of the Sustainable Development Goals. It is humanity's collective and universal plan to end hunger and promote good economic development and health within global environmental goals.

Second, after 21 years of negotiations, all countries in the world have adopted the legally-binding Paris Agreement to limit global warming to below 2 degrees Celsius, with a target of 1.5 degrees Celsius.

Three years later, we're still in the wave business.

Now, I think it's time to step back and recognize if world leaders really knew what they signed into the General Assembly three years ago.

These are universal, ambitious and transformative goals for an inclusive and prosperous human race on a stable earth system.

But there is an underlying problem.

There is an inherent contradiction between these goals and the risk of pursuing one preferred goal at the expense of others.

For example, consider Goal 8 on decent work and economic growth.

If we continue to exploit natural resources and burn fossil fuels, we will not be able to reach Goal 13.

Three years later, we have to admit that there is limited action to truly address this as a comprehensive, collective and universal package.

Now, this requires a step back.

I think we need to ask ourselves some tough questions. Is it possible to reach the Sustainable Development Goals by 2030?

Are there really inherent trade-offs that are incompatible with the current development paradigm?

But are there synergies that can really accelerate change?

And is it really a people and planet challenge, really taking seriously the ambitious social and economic goals of life support systems on Earth?

Citizens around the world are now beginning to realize that they face increasing global environmental risks. In fact, a stable planet is a prerequisite for good human well-being on Earth.

We need to define a safe operating space on a stable Earth system, and the planetary boundaries framework was introduced by the scientific community in 2009 to do just that.

It is now widely accepted worldwide in policy, business and community as a framework for Anthropocene sustainable development.

This slide demonstrates a framework of nine environmental processes that regulate the stability of the Earth system, providing a safe operating space in which human well-being, prosperity and equity can be achieved with high probability.

When you enter the yellow zone, you enter a dangerous uncertainty zone. And when we slip into deficit, we are more likely to cross a tipping point that could irreversibly jeopardize the Earth system's ability to provide humankind with social and economic well-being.

Now we can scientifically quantify these boundaries and provide a stable Earth system for humankind.

But we must go beyond this and recognize that the Sustainable Development Goals – if we really want to achieve them seriously – must be realized within this safe operating arena.

We need to achieve the SDGs within PB.

But dear ones, even this is not enough.

We need to recognize that it will take 12 years to reach the Sustainable Development Goals.

It's just a milestone.

It is a big goal that we need to go through and commit to the transformation that can bring a better future for all our more than 9 billion people on earth within a stable earth system beyond 2050.

This is a quest, and to really explore it, rather than just have an opinion about it, we have brought together the scientific community, leading thinkers and modelers to start developing an entirely new complex dynamics model, the Earth-3 model, based on models that have existed for the last 50 years.

And here it is.

This is great work.

It has a climate module, a biosphere module and a global economic model. It has algorithms and is packed with great achievements.

This is what motivates us scientists.

(Laughter) So this is just a beautiful piece of work?

And I would love to spend the night with you figuring this issue out, but I'm going to let you down.

I can't do that.

In fact, all I can do for you is ensure that this is your first time.

No one has actually tried to analytically combine the Sustainable Development Goals and planetary boundaries.

And along these consistent and systematic pathways, we were able to find trends that indeed converge with patterns that give us great confidence in our ability to predict economic development, resource use from water, food and energy, population growth and per capita income.

This is therefore the first time we have a strong opportunity to really explore the potential of the ability to achieve the SDGs within PB.

Well, how do we do that?

Now look at this.

Here is data from the real world calibrated from 1970 to 2015. 100,000 data points worldwide are based on the ability of seven regions to actually choose all these Sustainable Development Goals.

Now, just one example of how we've adjusted this, here's the [data] from the Sustainable Development Goals on ending poverty, health, education and food.

And here are seven regions of the world shown in bubbles, showing how our empirical observations fared in relation to GDP per capita up to 2015. This gives us a universal convergence trend, allowing us to create a regression function that allows future simulations up to 2050, along which the SDGs can be achieved.

This gave us the opportunity to run several scenarios and test different possible futures. It was about business as usual, global transformation, investment schemes in business, different governance options, policy, finance, etc., really to explore what the future might look like in terms of the ability to achieve the SDGs within PB.

And I can say that the results really surprised us.

And this time will be the first show.

In fact, you can't even see it outside of this room.

Well, it's actually displayed along two axes.

The Y-axis here shows our ability to stay within the boundaries of the planet.

The higher you go, the closer you get to a safe operating space.

The x-axis is the Sustainable Development Goals. The further to the right, the more SDGs we have achieved.

We all want to be in the top right corner, a safe and just world for the foreseeable future.

Now, the point you see there is 1980.

We were in the realm of safe operations, yet we were falling short of many of the SDGs.

Here are the trends for 2015.

So this is the conventional world, which is actually delivering more and more of the SDGs and lifting millions out of poverty, but at the expense of a safer working space on the planet.

Now, as always, this is scenario business into the future.

If we move forward as we do today, we can achieve some of the SDGs, but at the expense of the stability of the Earth system.

Now, what if we accelerated economic growth, increased annual income by 1%, and really helped triple the global economy by 2050?

This will give you a trajectory like this:

Certainly, we intend to make a little more progress towards achieving the SDGs, but we still have to sacrifice the risk of destabilizing the planet.

But what if we really tried harder?

What if we were 30% more capable of delivering on promises in all areas of society, from climate change to trade agreements?

We would be a little better off in a more difficult scenario, but we are still falling short of the SDGs and a safe operating space for humanity.

So this actually led us to the very disappointing conclusion that even if we proceeded to a conventional future, we would actually fail the SDGs and cross planetary boundaries.

It requires a radical mindset.

We need to move forward into a transformative and disruptive future where we start thinking outside the box.

Through modeling, engagement, and dialogue, we can identify five transformations that could actually get you there.

The first is to cut emissions in half every decade along the scientific pathway to Paris, double investment in renewable energy, build a global energy democracy, and enable some of the SDGs to be achieved.

The second is a rapid transition to a sustainable food system, investing 1% annually in sustainable enhancement, and committing to deploying and investing in solutions already available today.

The third is to actually shift the development paradigm and learn from many developing countries that are moving very fast.

What if we could achieve China-like economic growth within the environmental parameters of ecological civilization?

Fourth, redistribution of wealth.

What if we [agreed] not to allow the richest 10 percent to accumulate more than a maximum of 40 percent of the national income? This would be a radical redistribution of wealth and a reform of equity between regions.

And finally, a fundamental increase in education, health, access to work and contraception, primarily through investments in women around the world, that will enable the achievement of the SDGs on gender, inequality, economy and urban development.

Well, if we can get past all 5 of these, we tested this. And it will give us a wonderful journey towards a safe and just working space on earth.

This puts us in a position to really conceive of transformations over the next 12 years and beyond that can reach safe operating territory and achieve ambitious social and economic goals, even with conservative, empirical, and complex system dynamics models.

Despite the fact that we are not on this trajectory, this is actually quite uplifting.

In summary, three years after the SDGs were operational, we must draw the line and conclude that we have not delivered on our promises. Not only that, but the risk of pushing the Earth system past a tipping point puts future generations at risk of even tougher capacities.

In fact, we even face the risk of a greenhouse Earth that could undermine and create geopolitical instability that actually makes life more difficult for billions of people on Earth.

To be honest, this is really scary.

But that's also why I'm standing here tonight. Because the window of success is still open.

The Earth system is still resilient.

She continues to provide us with ecosystem services and features that enable us to transition to a safer playing field.

But it requires a fundamentally different mindset.

We need to see this not only as a great wake-up call, but also as an opportunity for change. We need to shift gears and start thinking seriously about the SDGs as a transformational agenda within the safe playing field on the planet.

In other words, we can build a safe and just world.

There is really no choice but to really do it.

And let's do it. thank you.

(applause)

One day about ten years ago, I had a friend hold a baby dinosaur robot upside down.

I ordered a toy called Pleo, and since I love robots, I was really looking forward to it.

And this one has really nice technical features.

It was equipped with a motor and a touch sensor, and an infrared camera was also installed.

And one of the things it had was a tilt sensor, so it could tell which direction it was facing.

If you hold it upside down, it will start crying.

I thought this was pretty cool, so I was showing it off to my friends and I said, "Oh, take the tail and lift it up. We'll see what happens."

That's why we're watching this robot struggle and scream theatrically.

And after a few seconds, it started to bother me a little bit, so I said, 'Okay, that's enough.

Then stroke the robot to make it stop crying.

And it was kind of a strange experience for me.

First, I wasn't a very maternal person back then.

Having said that, I became a mother nine months ago, and I learned that babies also get shy when held upside down.

(Laughter) But my reaction to this robot was also interesting. Because I knew exactly how this machine worked. Even so, I still felt that I had to be kind to this robot.

And that observation sparked a curiosity I've been pursuing for the past decade.

Why did I comfort this robot?

And one of the things I discovered was that my treatment of the machine wasn't just an awkward moment in the living room. That such instincts can have real consequences in a world where robots are increasingly embedded in our lives. Because my first discovery is that I'm not alone.

In 2007, The Washington Post reported that the U.S. military was testing this robot to disarm mines.

Its mechanism was that it was shaped like a stick insect and walked around a minefield with its feet, one foot detonating each time it stepped on a mine, and the other foot continuing to detonate more mines.

The colonel in charge of the test exercise eventually called it off because it was too inhumane to watch the damaged robot drag it through a minefield.

So what causes die-hard soldiers and people like me to react this way to robots?

Of course, we are inspired by sci-fi and pop culture to want to personify these things, but it goes a little deeper.

It turns out that we are biologically hardwired to project intent and life into every seemingly autonomous movement within physical space.

So people will treat all kinds of robots as if they were alive.

These bomb squads have names.

They get an honorary medal.

Their funeral was held with a gun salute.

Studies show that very simple home robots like the Roomba vacuum cleaner do the same.

(Laughter) It's just a disk that walks around the floor to clean the floor, but the mere fact that it's moving around on its own makes people name it a Roomba and feel sorry for it when it falls under the couch.

(Laughter) And we can design robots that specifically evoke this response, with eyes and faces and movements that humans automatically and unconsciously associate with states of mind.

And there is a body of research called Human-Robot Interaction that really shows how well this works.

For example, researchers at Stanford University found that people felt very uncomfortable when asked to touch a robot's genitals.

(Laughter) From this, and from many other studies, we know that people respond to cues given by these authentic machines, even though they know it's not real.

We are now heading towards a world where robots are everywhere.

Robot technology is coming out from behind the walls of the factory.

It has invaded our workplaces and homes.

And as these machines that can sense, decide autonomously, and learn enter these shared spaces, I think perhaps the best analogy for this is our relationship with animals.

Thousands of years ago we started domesticating animals, training them for jobs, weapons and companionship.

And throughout history, we have treated some animals like tools and products, and treated others with kindness, giving them a place in society as companions.

I think it's quite possible that we will start integrating robots in a similar way.

And indeed, animals are alive.

Robots are different.

And I can tell you from my experience working with roboticists that we are very far from developing robots that can feel something.

But we sympathize with them, and that's what matters. If we are to integrate robots into these shared spaces, we need to understand that people treat robots differently than other devices, and that in some cases, for example, soldiers emotionally attached to the robots they work with, it can range from inefficient to dangerous.

But sometimes cultivating an emotional connection with a robot can actually help.

We are already seeing some great use cases, such as working with children with autism to engage robots in ways never seen before, and robots working with teachers to engage children in learning and achieve new outcomes.

And it's not just for children.

Early research shows that robots can assist doctors and patients in medical settings.

This is a baby seal robot "Paro".

It is used in nursing homes and in the treatment of dementia patients.

It's been around for a while.

And I remember years ago, when I was at a party and told someone about this robot, her reaction was, "Oh my god."

That sounds terrible.

This is a very common reaction and I think it's absolutely correct. Because it sucks.

But in this case, it's not a replacement for this robot.

What this robot replaces is animal therapy in situations where real animals cannot be used but robots can. Because people always treat robots like animals rather than devices.

Recognizing this emotional connection to robots can also help us anticipate challenges as these devices transition into more intimate areas of people's lives.

For example, is it okay for my child's teddy bear robot to record private conversations?

Is it okay if your sex robot has attractive in-app purchases?

(Laughter) Because robots and capitalism equate to consumer protection and privacy issues.

That's not the only reason why our actions on these machines matter.

Years after my first experience with this baby dinosaur robot, I did a workshop with my friend Hannes Gassert.

Then I took out 5 of these baby dinosaur robots and gave them to 5 teams.

Then, we gave them names and played with them, and we interacted with them for about an hour.

And we showed off our hammers and hatchets and told them to torture and kill the robots.

(Laughter) And this turned out to be a little more dramatic than we expected. Because none of the participants even attacked these baby dino robots, we had to improvise a bit and at one point we said, "OK, if we destroy the other team's robots, we can save our team's robots."

(Laughter) And even that didn't work. they couldn't do it.

So at the end we said, 'We're going to destroy all the robots unless someone takes an ax to one of them'.

Then the man stood up, picked up the hatchet, and swung the hatchet down the robot's neck, causing the whole room to flinch, and there was a moment of half-joking, half-serious silence in the room because of the fallen robot.

(laughs) It was a very interesting experience.

This was clearly not a controlled study, but it led to a study I later did with Palash Nandy and Cynthia Brezeal at MIT. We had people come into the lab and smash a HEXBUG that moved around like an insect, just like the real thing.

So instead of choosing something cute that people would be drawn to, I chose something more basic. We found that people with high empathy were more reluctant to attack HEXBUGS.

It's just a small study, but it's part of a larger study that's starting to show a possible link between people's propensity for empathy and their behavior around robots.

But my question for the next era of human-robot interaction is not, "Can we empathize with robots?"

The question is, "Can robots change people's empathy?"

For example, is there any reason to ban children from kicking robot dogs, not just because of property respect, but because children are more likely to kick real dogs?

Again, it's not just kids.

This is a violent video game problem, but it's on a whole new level because we react more violently to this instinctive physicality than to the images on the screen.

When we behave violently towards robots, especially those designed to mimic life, is it a healthy outlet for violent behavior, or are we training muscles of cruelty?

I do not understand...

But the answer to this question can influence human behavior, influence social norms, and create rules about what certain robots can and cannot do, similar to laws on animal cruelty.

Because our actions towards robots may matter to us, even if they can't feel.

And whether we end up changing the rules or not, robots may help us gain a new understanding of ourselves.

Most of what I've learned in the last decade wasn't about technology.

It is about human psychology and empathy and how we relate to others.

Because when a child is kind to a Roomba, a soldier tries to save a robot on the battlefield, or a group of people refuses to harm a robotic baby dinosaur, those robots are more than just motors and gears and algorithms.

They reflect our own humanity.

thank you.

(applause)

Everyone please close your eyes...

Then imagine yourself sitting in the middle of a large field with the sun setting on your right.

And imagine that as the sun sets, not only can you see the stars appear tonight, but you can hear them appear with the brightest stars playing the loudest and the hotter blue stars playing the higher notes.

(music) And since each constellation is made up of a different kind of star, each produces its own melody, such as Aries or the Ram.

(music) Or Orion the Hunter.

(music) Or Taurus the Bull.

(Music) We live in a world of music that allows us to experience music from a new perspective and share that perspective with a wider audience.

Tell me what you mean

(music ends) Now, when I tell people that I'm an astrophysicist, they're usually pretty impressed.

So when I tell them I'm a musician too, they say, "Oh, I know."

(Laughter) So everyone seems to know that there is a deep connection between music and astronomy.

And it's actually a very old idea. It dates back over 2000 years to Pythagoras.

You may remember Pythagoras from the Pythagorean Theorem and other theorems -- (Laughter) And he said, "There's geometry in the hum of strings, there's music in the spacing of spheres."

So he literally thought that the motion of the planets along the celestial sphere produced harmonious music.

And if you ask him, "Why don't you ask me anything?"

He will say you can't hear it because you don't know what it feels like to not hear it. You don't know what real silence is.

It's like having to wait for the power to go out to hear your fridge hum.

Perhaps you would buy it, but not everyone else, including names like Aristotle, was buying it.

(Laughter) That's exactly what it says.

(laughter) So let me paraphrase what he said exactly.

He said it was a good idea, but if something as big and vast as heaven itself was moving and making noises, it would not only be heard, it would be earth-shattering.

Since we exist, there is no sphere music.

He also believed that the only purpose of the brain was to cool the blood.

(Laughter) But in a way, I want to show that they were actually both right.

And let's start by understanding what makes music music.

It may sound like a silly question, but have you ever wondered why, like these two notes (music), when played together, certain notes sound relatively pleasant or consonant-like, while others sound more tense or dissonant?

(music) Right?

why is that? Why are there notes in the first place?

Why do we get in and out of tune?

Well, the answer to that question was actually solved by Pythagoras himself.

Notice the leftmost string.

When the string is plucked with a bow, the string vibrates back and forth very quickly to produce a sound.

(note) But if you cut the string in half, you get two strings, each vibrating twice as fast.

And it will generate related notes.

Or three times faster, or four times faster -- (note) And the secret of musical harmony really lies in simple ratios. The simpler the ratio, the more pleasing or consonant these two sounds sound together.

And the more complex the ratio, the greater the dissonance.

And the interplay between tension and release, or consonance and dissonance, produces what we call music.

(music) (end of music) (applause) Thank you.

(Applause.) But that's not all.

(Laughter) So the two characteristics of music that we tend to think of as pitch and rhythm are actually two versions of the same thing that I can show you.

(slow rhythm) It's a rhythm, right?

Let's see what happens when we increase the speed.

(Rhythm gradually becomes faster) (Pitch becomes higher) (Pitch becomes lower) (Rhythm becomes slower) In other words, when the rhythm starts to occur about 20 times or more per second, the brain flips.

It ceases to sound like rhythm and begins to sound like pitch.

So what does this have to do with astronomy?

Well, that's when we get to the TRAPPIST-1 system.

This is an exoplanet system discovered last February 2017 that got everyone excited because seven Earth-sized planets all orbited very close to a red dwarf star.

Three of these planets are thought to have suitable temperatures for liquid water.

It's also so close that within the next few years we should be able to detect elements in the atmosphere that are potential signs of life, such as oxygen and methane.

But one of the characteristics of the TRAPPIST system is that it is small.

Here are the orbits of the inner solar system's rocky planets: Mercury, Venus, Earth, and Mars, and all seven Earth-sized planets in TRAPPIST-1 lie well within Mercury's orbit.

To see the orbits of the TRAPPIST-1 planets, you need to magnify this by a factor of 25.

Seven Earth-sized planets orbiting a star, but in reality they are much more similar in size to our planet Jupiter and its moons.

Another thing that got everyone excited was artist renderings like this one.

If you have liquid water, ice, maybe land, you might be able to go diving in this amazing orange sunset.

This got everyone excited, but a few months later, another paper was published that actually said it was probably similar.

(Laughter) So there were indications that part of the surface could actually be molten lava, and that the central star was emitting very noxious X-rays. X-rays sterilize the surface of life and strip away even the atmosphere.

Luckily, just a few months ago in 2018, some new papers were published showing more sophisticated measurements, and it turns out that this is indeed the case.

(Laughter.) So, some of them have vast water sources, or global oceans, and some of them have thick atmospheres, so we know they're great places to look for potential life.

But there is something more exciting about this system, especially for me.

That is, TRAPPIST-1 is a resonance chain.

So for every 2 orbits of the outer planets, the next planet 3 times, the next 4 times, and so on 6, 9, 15, 24 times.

So we can see that the orbits of these planets have a lot of very simple ratios.

Obviously, if you move faster, you can get the rhythm, right?

For example, one beat for each revolution of the planet.

However, I found that speeding up that action even more actually produced a musical pitch. Only in this case can their pitches work together to produce harmonious, even human-like harmonies.

Let's listen to TRAPPIST-1.

The first thing you hear is the sound of all the orbits of each planet. Note that this music comes from the system itself.

I'm not creating pitches or rhythms, I'm just bringing them within the range of human hearing.

And after all seven planets are in, you will hear a drum every time two planets align.

Then they approach each other and gravitationally pulls them together.

(sound) (two sounds) (three sounds) (four sounds) (five sounds) (six sounds) (seven sounds) (sound of a drum) (music ends) And it is the sound of the stars themselves, their light transformed into sound.

So you may be wondering how this is possible.

Think of it like an orchestra.

When everyone gets together and starts an orchestra, you can't suddenly join, right?

Everyone has to tune in. They needed to make sure their instruments resonated with those next to them, and something very similar happened in the early days of TRAPPIST-1.

When planets first formed, they orbited in a disk of gas, but as they actually glide within that disk, they can align their orbits with their neighbors until they are in perfect harmony.

I think this is a good thing they did because this system is very compact and has a lot of mass in a small space. If every aspect of their orbits were not very finely tuned, they would soon disrupt each other's orbits and destroy the entire system.

In short, it is precisely the music that keeps the system and its potential inhabitants alive.

But what does our solar system sound like?

I hate to show this, but it's not very pretty.

(Laughter) First, our solar system is on a much larger scale, and to hear all eight planets, we have to start with Neptune near the bottom of our audible range, and then Mercury comes near the top of our audible range.

But also, our planets are not so compact, they are so spread out that they don't have to orbit each other, it's like they each play their own random sound at random times.

So, sorry, here we are.

(Tone) It's Neptune.

(two-tone) Uranus.

(three sounds) Saturn.

(four sounds) Jupiter.

And hidden there is Mars.

(five tones) (six tones) Earth.

(seven sounds) Venus.

(8 sounds) And it's Mercury -- OK, OK, stop.

(Laughter) This was actually Kepler's dream.

Johannes Kepler was the man who discovered the laws of planetary motion.

He was completely fascinated by the idea that there was a connection between music, astronomy and geometry.

So he actually spent a whole book looking for all sorts of musical harmonies between the planets of the solar system, and it was really, really hard.

It would have been easier if he lived in TRAPPIST-1, and for that matter...

K2-138。

This is a new star system containing five planets discovered in January 2018, and like TRAPPIST, everything was fine-tuned in the early stages of its existence.

They were actually tuned to a tuning structure proposed by Pythagoras himself over 2,000 years ago.

However, the system is actually named after Kepler, which was discovered by the Kepler Space Telescope.

Over the last few billion years, they have actually lost their tuning, much more than TRAPPIST. So what we're trying to do is go back in time and imagine what it sounded like when they were just forming.

(music) (end of music) (applause) Thank you.

Now you may be wondering: how far will this go?

How much music is there in the world?

I was wondering that last fall when I was working in the planetarium at T University. Then I was contacted by an artist named Robin Rennie and her daughter Erin.

Robin loves the night sky, but has been unable to see it completely for 13 years due to her vision problems.

So they wondered if there was anything I could do.

So I collected every sound I could think of from the universe and packaged it into 'Our Musical Universe'.

A sound planetarium show that explores the rhythm and harmony of the universe.

And Robin was so moved by this presentation that when she got home, she drew this wonderful representation of her experience.

And I put Jupiter for posters and made it dirty.

(laughs) So...

The show takes people of all visual levels on an audio tour of the universe, from the night sky to the edges of the observable universe.

But this is just the beginning of a musical journey to experience the universe with new eyes and new ears. Please join us.

thank you.

(applause)

In Australia's lush rainforests, birds roost on low branches and roam the forest floor, enjoying shade and tropical fruit.

But the jungle isn't just for them.

Dingoes stalk shadows and their appetites are not satisfied with fruit.

Birds flee to safety, but cassowaries cannot clear the ground with their tiny wings.

Instead, she attacks and runs the dingo into hiding with her razor-sharp toenails.

The cassowary is one of about 60 species of modern flightless birds.

These earthbound birds live all over the world, from the Australian outback to the African savannah to the Antarctic coast.

They include several species of ducks and all kinds of penguins, secretive swamp-dwellers and swift ostriches, giant emus and tiny kiwis.

The common ancestor of all modern birds was able to fly, but many different birds became unable to fly independently.

Flight offers incredible advantages, especially when it comes to escaping predators, hunting, and traveling long distances.

But it also comes at a higher cost. It consumes an enormous amount of energy and is also restricted in body size and weight.

Non-flying birds conserve energy, so they may be able to survive on fewer or less nutritious food sources than flying birds.

For example, the New Zealand takahe lives almost entirely on a soft base of alpine grass.

Ground-nesting and foraging birds may be even more prone to flightlessness.

If a bird species is not exposed to special flight pressures, it may cease to fly within a few generations.

Then, over thousands or millions of years, the bird's body changes to accommodate this new behavior.

The bones are now hollow to minimize weight, but are denser.

Their tough plumage becomes fuzzy.

Feathers shrink and in some cases disappear completely.

And the keel-like projection of the sternum, to which the flight muscles attach, shrinks or disappears, except in penguins, which reuse the flight muscles and keel for swimming.

Most often, flightless birds develop after flying to a predator-free island.

As long as this predator-free environment continues, birds will thrive, but they are vulnerable to environmental change.

For example, human settlers bring dogs, cats, and stowaway rodents to the island.

These animals often prey on flightless birds, potentially driving them to extinction.

In New Zealand, stoats introduced by European settlers threaten many native flightless birds.

Some are extinct, while others are endangered.

So, despite the energy-saving benefits of being flightless, many species of flightless birds have a short time to follow the dodo's path.

However, a few flightless birds survive on the mainland, along with many predators.

Unlike most small, flightless species that fly back and forth quickly, these giants have been flightless for tens of millions of years.

Their ancestors appeared around the same time as the first small mammals and evolved and developed at the same time as their predatory mammals, which probably enabled them to survive.

Most of these birds, such as emus and ostriches, grow in size and are hundreds of pounds heavier than they can lift their wings.

Their legs became thicker and stronger, and newly developed thigh muscles turned them into formidable runners.

Although they no longer use their wings to fly, many of these birds reuse their wings for other means.

They have also been seen tucking their heads downwards to keep them warm, turning their heads toward mates, hiding eggs, and manipulating their heads as they charge across the plains.

They may not be able to fly, but they still spread their wings.

What does it mean to be normal?

And what does sickness mean?

I have been asking myself this question since I was diagnosed with Tourette Syndrome when I was about seven years old.

Tourette's disease is a neurological disorder characterized by stereotypic, involuntary movements called tics.

Now, tics are technically involuntary in the sense that they occur without conscious attention or intention on my part.

But there's something interesting about the way I experience my tics.

Because it feels like it's you who's moving your shoulders, not some external force.

Also, right before a tic occurs, especially when you are trying to resist it, you experience an unpleasant sensation called a premonition.

Now, I think most people get what I'm saying, but unless you have Tourette's, you probably don't feel empathy.

But I bet you can.

So let's do a little experiment here and see if you can get a taste of what my experience is like.

yes, are you ready?

don't blink.

No, really, don't blink.

What do you feel other than dry eye?

Phantom pressure?

Do your eyelids tingle?

need?

are you holding your breath?

(laughs) Oh.

(Laughter) My tics are pretty much like this.

Now, neurologically speaking, tics and blinks are not the same thing, but what I'm trying to say is that the brain can confer similar experiences and emotions, so you don't have to have Tourette's disorder to be able to relate to my experience of precognitive urges.

Now let's change from what we mean by normality and disease to what we mean by the majority of us being both normal and sick.

Because, after all, we are all human beings whose brains offer different experiences.

And everything within the human experience is ultimately produced by the brain system assuming various states.

So, once again, what does it mean to be normal? And what does it mean to be ill if it exists at the extremes of the normal range?

As a researcher who studies differences in how an individual's brain wires and rewires, and as a touretter working with other related diagnoses, I have long been fascinated by self-control failures on the impulsive and compulsive behavior spectrum.

Because many of my own experiences with my own body and behavior are all over that map.

With the opioid crisis in the spotlight, I'm really wondering these days. Where do things like opioid painkillers and heroin abuse fall on the spectrum of involuntary behavior?

By now, we all know that the opioid crisis and epidemic is spiraling out of control.

Every day, 91 people die from overdoses in this country.

And between 2002 and 2015, heroin deaths increased sixfold.

And there's something about addiction treatments that doesn't work for everyone, at least.

It is true that people who suffer from addiction have no free will regarding drugs, alcohol, food, and other behaviors that stimulate the reward system.

It is a medical and neurobiological reality that addiction is a brain-based disease state.

But how we relate to the disease, and indeed to the concept of the disease in terms of addiction, makes a big difference in how people with addiction are treated.

As such, we tend to think of almost everything we do as entirely autonomous.

But it turns out that the brain's default state is actually closer to an idling car than it is to a parked car.

Some of the things we think we choose are actually programmed to do when the brakes are released.

Have you ever joked that your brain is on autopilot?

guess what?

It probably was.

OK？

And the brain's autopilot resides in a structure called the striatum.

Thus, we know that the striatum detects emotional and sensory-motor states and triggers the behaviors most frequently performed in the past under the same conditions.

Do you know why I became a neuroscientist?

Because I wanted to know what got me excited.

(laughs) Thank you, thank you.

(Laughter) I've wanted to use it in front of an audience for years.

(Applause.) So in graduate school, I studied the genetic factors that regulate wiring to the striatum during development.

Yes, that's my old license plate.

(Laughter) Just to be clear, I wouldn't recommend a PhD student to get a license plate with the subject of their thesis printed on it, unless you're prepared to do no experiments for the next two years.

(Laughs) I finally figured it out.

My experiment was therefore to investigate how miswiring of the striatum is related to compulsive behavior.

In other words, it is a behavior that is forced by an unpleasant urge that cannot be consciously resisted.

That's why I got really excited when a mouse took on this obsessive behavior. Despite rubbing his face and hurting himself, he doesn't seem to stop.

OK, excited is the wrong word, but I actually felt bad for them.

I thought they had tics, evidence of striatal miswiring.

And although they were compulsive, further experiments revealed that these mice showed an aversion to interacting and getting to know other unfamiliar mice.

It was unusual and unexpected.

The results suggest that the striatum, which is indeed implicated in obsessive-compulsive spectrum disorder, is also involved in human social connections and, rather than human social connections, our ability to connect.

So I delved deeper into a field called social neuroscience.

And this is a newer, interdisciplinary field, where I found reports linking the striatum to social abnormalities in humans as well as mice.

After all, it turns out that striatal social neurochemistry is related to something you've probably already heard.

Like oxytocin, it's a hormone that makes you feel warm and fluffy when you cuddle.

However, it is also involved in signaling at opioid receptors.

There are natural opioids in the brain that are closely related to social processes.

Experiments with naloxone, which blocks opioid receptors, show how important this opioid receptor signaling is for social interactions.

When people are given naloxone, which is the ingredient in Narcan, it reverses opioid overdoses and saves lives.

But giving it to healthy people actually interfered with their ability to feel connected to people they already knew and cared about.

In other words, the lack of opioid receptor binding makes it difficult for us to feel the benefits of social interaction.

Now, for the sake of time, I've inevitably left out some of the scientific details, but in a nutshell, that's the conclusion.

The effects of social withdrawal through opioid receptors, the effects of drugs of abuse, and the effects of abnormal neurotransmission on involuntary movements and compulsive behaviors all focus in the striatum.

And the striatum and its opioid signaling are deeply linked to loneliness.

When we don't have enough signaling at our opioid receptors, we can feel lonely in a room full of people we care about and love us.

Social neuroscientists like Dr. Cacioppo at the University of Chicago have found that loneliness is extremely dangerous.

And it makes people susceptible to a whole range of physical and mental ailments.

Think of it like this: Almost any food tastes good when you're most hungry.

Similarly, loneliness causes hunger in the brain and neurochemically sensitizes the reward system.

And social isolation, acting through these naturally occurring opioid and other social neurotransmitter receptors, puts the striatum into a state of complete overreaction to signals of reward and pleasure.

And in this hypersensitive state, our brain signals deep dissatisfaction.

We become restless, irritable, and impulsive.

That's exactly when you want a bowl of Halloween chocolates to be left across the room all the time. Because I will eat them all.

I'm from now on.

And that brings up another thing that makes social disconnection so dangerous.

Our inability to connect socially and our longing for our social neurochemistry to be balanced can lead us to seek help everywhere.

And if it's opioids or heroin, it will be a heat-seeking missile for our social reward system.

In today's world, is it any wonder that people can become addicted so easily?

Social isolation - excuse me - contributes to relapse.

Studies have found that people who tend to avoid relapses tend to be those who have broad and reciprocal social relationships in which they can be helpful and useful to each other.

Therefore, if we do not have the ability to truly connect, our society increasingly lacks the ability to truly connect and experience that which transcends ourselves.

We used to get this transcendence from our sense of belonging to family and community.

But communities everywhere are changing.

And social and economic collapse has made this all the more difficult.

I am not the only one to point out that the areas in the country that have been hit the hardest economically and where people feel the most devastated about their meaning in life are also where the communities most devastated by opioids are.

Social isolation works through the brain's reward system, making the situation literally painful.

So perhaps it is this pain, this loneliness, this despondency that drives many of us to connect in whatever way we can.

like food.

Things like portable electronic devices.

And too many people turn to drugs like heroin and fentanyl.

I know someone who overdosed and was resuscitated by Narkan, but she was mostly upset that she simply wasn't allowed to die.

Just imagine what it's like, that desperate situation, okay?

But the striatum is also a source of hope.

Because the striatum gives us hints on how to get people back.

So the striatum is our autopilot, it executes behaviors according to our habits, and while it is possible to rewire and reprogram that autopilot, remember that it involves neuroplasticity.

So neuroplasticity is the ability of the brain to reprogram and rewire itself so that we can learn new things.

And you've probably heard the classic adage about plasticity: neurons fire together and wire together.

right?

Therefore, social bonding behaviors, rather than compulsive behaviors, should be practiced when lonely or when prompted to remember drugs.

To acquire the necessary neuroplasticity that allows the striatum to take the “go find heroin” autopilot offline, neurons need to fire repeated experiences.

And the convergence of social neuroscience, addiction, and obsessive-compulsive spectrum disorders in the striatum suggests that it is not enough to teach the striatum a healthier response to compulsive impulses.

There is a need for social compulsions to replace drug-induced compulsive behaviors, as the social reward system needs to be neurochemically rebalanced.

And unless that happens, we will be left in a state of craving.

We practice repeatedly, no matter what but drugs.

I believe the solution to the opioid crisis is to explore how social and psycho-spiritual interventions function as neurotechnology in the circuits that process social and drug-induced rewards.

One possibility is to create and research scalable tools for connecting people with a common interest in recovery through spiritual practices.

So mind-spiritual practices can include anything from people coming together as big fans of touring jam bands and parkour jams to share their experiences of vulnerability and personal growth, to more traditional ones like recovery yoga meetups and meetings centered around more traditional concepts of spiritual experience.

But whatever it is, all neurotransmitter systems in the striatum involved in processing social connections need to be activated.

You can't dig this deep on social media.

Social media encourages comparing, not sharing.

It's the difference between having a superficial chat with someone and having a deep, genuine conversation while making eye contact.

And stigma is also what separates us.

There is a lot of evidence that it causes our illness.

And stigma often makes it safer for addicts to connect with other addicts.

However, recovery groups centered around re-establishing social ties can certainly include people seeking recovery for a variety of mental health problems.

My point is that when we connect around what is broken, we connect as humans.

We heal ourselves from the compulsive self-destruction that is our response to the pain of disconnection.

Thinking of neuropsychiatric disorders as a set of phenomena that are part of what makes us human excludes the otherness of those who struggle with self-destruction.

We remove stigma between doctors, patients and caregivers.

We bring the question of what it means to be normal and sick back to the spectrum of the human condition.

And it is on this spectrum that we can all connect and seek healing together for all our struggles with humanity.

Thank you for sharing.

(applause)

The great philosopher Aristotle said that if something does not exist, there are no words to describe it, and if there are no words to describe something, it does not exist.

So when we talk about elections, those of us who live in established democracies know what we're talking about.

The word has been decided. We have vocabulary.

We know what polling places are.

We know what ballots are.

But what happens in a country where democracy does not exist, where there are no words to describe the concepts underpinning a democratic society?

I work in the field of election assistance. That means helping emerging democracies hold their first elections.

When people ask me what I do, I often get this answer.

"Oh, you're one of those people who go around the world imposing Western democracy on countries that can't stand Western democracy."

Well, the United Nations does not force anyone to do anything.

Not really, and what we are doing is firmly rooted in Article 21 of the 1948 Universal Declaration of Human Rights, which states that everyone should have the right to choose whom to govern.

That's the basis of my work.

I specialize in public relations.

what do you mean? another jargon.

In practice, this means designing information campaigns to help candidates and voters who have never had the opportunity to participate or vote before understand where, when and how to register. Where, when and how to vote. Why and why is it important to participate?

So I will probably come up with a specific campaign to reach out to women to make sure they are on board and involved in the process.

So do young people.

There are many people.

handicapped.

We strive to reach everyone.

And it's not always easy. Because in this job, after years of doing this job, I often find myself short of words. So what do you do?

Afghanistan.

The country has a high illiteracy rate and in 2005 two elections were held on the same day.

The reason is that logistics is very difficult, so I thought it would be more efficient to do so.

That was the case, but on the other hand it was more complicated to account for two elections instead of one.

So I used a lot of images, but when it came to the actual voting, I ran into problems. So many people wanted to participate that there were 300 candidates for 52 seats in the Wolesi Jirga parliamentary elections.

And the state legislature had even more candidates.

There were 330 seats for 54 seats.

Speaking of the ballot design, the ballot looked like this:

It's about the size of a newspaper.

This was the Wolesi Jirga ballot -- (laughter) yes, and -- this was the state legislative ballot.

moreover.

As you know, we used a lot of symbols and such.

And South Sudan had another problem.

South Sudan was a completely different situation.

Of course there were a lot of people who had never voted, but there was a very, very high level of illiteracy and very poor infrastructure.

For example, I mean, a country more or less the size of Texas.

There are seven kilometers of paved roads, seven kilometers across the country, including the tarmac where planes landed at Juba Airport.

Therefore, it is very difficult to carry election materials.

People had no idea what a box looked like.

It's so complicated that oral communication is the best, of course, but there were 132 languages.

It was very challenging.

And in 2011 I came to Tunisia.

It was the Arab Spring.

The great movement that was taking place in the region gave rise to great hope.

There was Libya, there was Egypt, there was Yemen.

It was a huge, huge historical moment.

And I was sitting with the Election Commission talking about different aspects of the election. And I was hearing them use words I had never actually heard before. I've worked with Iraqis, I've worked with Jordanians, I've worked with Egyptians, and all of a sudden they started using these words and I was like, 'This is weird.

And it was this word "observer" that really gave birth to it.

We were discussing election observers, and the election commissioner was speaking in Arabic about "Mulahiz."

It means ``noticing'' in the passive sense, like ``I noticed he was wearing a light blue shirt''.

Did you go check if the shirt is light blue?

That is the role of election observers.

It is very active and governed by all kinds of treaties, within which there are control functions.

And I learned that the word "Mutabi", which means "to obey", is used in Egypt.

It means that there are supporters of the election.

So this is also completely incorrect. Because there are terms that are already accepted and used. It's the word 'muraqib' which means 'controller'.

There is the concept of control.

So I decided to try to express one concept in three words. This is bad.

And we, along with our colleagues, thought that perhaps it was our role to actually help ensure that the language was understood and to actually create a reference material that could be used throughout the Arab region.

And that's what we did.

So, together with our colleagues, we launched the Arabic Dictionary of Election Terms, which has been active in eight countries.

That meant actually defining the 481 terms that are the foundation of everything you need to know when organizing democratic elections.

We then defined these terms and worked with our Arab colleagues to reach agreement on the appropriate words to use in Arabic.

Because Arabic is very rich and that's part of the problem.

However, there are 22 Arabic-speaking countries that use Modern Standard Arabic. This is the Arabic language used throughout the region in newspapers and broadcasts. However, of course, everyday languages ​​are used in different countries, and dialects, colloquialisms, etc. are also different.

In other words, an additional layer of complexity has been added.

So, in a way, the problem was that the language wasn't fully mature. It means that new words and new expressions have appeared.

So we defined all these terms and put eight correspondents in the area.

We submitted the draft to them and they got back to us.

"Yes, I understand the definition.

We agree with that, but this is what we say in our country. ”

Because we weren't trying to create or force harmony.

We tried to facilitate people's understanding.

The yellow part shows different expressions used in different countries.

It took me 3 years to create this, which I'm happy to say. Because we also completed the draft, took it into the field, consulted with various national election commissions, discussed, defined and refined the draft and finally launched it in Cairo in November 2014.

And it's been a long road. 10,000 copies have been issued.

To date, approximately 3,000 have been downloaded in PDF format from the Internet.

Just recently, I heard from a colleague that it was also picked up in Somalia.

They plan to make a version of this in Somalia as there are none in Somalia.

That's very good.

And this newly formed Arab Electoral Authority organization, which seeks to professionalize how elections are run in the region, is using it as well.

And the Arab League has now established and is using a Pan-Arab Observation Force.

That's really good.

However, this reference is pretty lofty.

It's complex, and much of the terminology is so technical that the average person probably doesn't need to know at least a third of it.

But people in the Middle East have been stripped of every form we know as civic education.

It's part of the school curriculum.

It doesn't really exist in that part of the world, but I feel it's everyone's right to know how these things work.

And it's good to think about making a work that can be a reference for the general public. Keep in mind that now we not only have the infrastructure to work with, but we have the technology, so we can use phone apps, videos, and animations to stay in touch.

Now there are all sorts of tools you can use to bring these ideas to people in their native language for the first time.

We hear many tragic stories about the Middle East.

I hear the turmoil of war. I hear the voice of terror.

We hear about sectarianism and this terrible negative news that reaches us all the time.

What we don't hear is what people, the public, think.

what are they aiming for?

Give them the means, give them the language.

The silent majority are silent because they have no words.

The silent majority needs to know.

The time has come to provide people with knowledge tools that allow them to gain information.

The silent majority need not be silent.

Help them raise their voices.

thank you very much.

(applause)

Some people fall in love with French wine.

Some like to play golf or devour literature.

One of the greatest pleasures of my life, I must admit, is a little bit special.

Words cannot describe how much fun it is to see the city from the air, from the window of an airplane.

Some cities, like Düsseldorf and Louisville, are calm and hard working.

Some, like New York and Hong Kong, project irrepressible energy.

And Paris or Istanbul have patinas full of history.

I see cities as living things.

And when I discover them from far above, I like to find the boulevards and highways that make up the space.

Commuters make these arteries dramatically red and gold, especially at night, and the city's vascular system performs its vital functions before your eyes.

But that reality looks very different when you're sitting in your car after your daily hour-and-a-half commute.

(Laughter) Nothing -- public radio or podcasts -- (Laughter) Not even mindfulness meditation makes this time worth living.

(Laughter.) Isn't it ridiculous that we've developed a car that can reach 130 miles per hour and drive it at the same speed as a 19th-century horse-drawn carriage?

(Laughter) In the United States alone, people spent 29.6 billion hours commuting in 2014.

With that much time, the ancient Egyptians could have built the 26 Pyramids of Giza.

(Laughter) We'll do that in a year.

A colossal waste of time, energy and human potential.

For decades, our solution to congestion has been simple. It was to build new roads or widen existing roads.

And it worked.

In Paris, this has worked spectacularly, with the city demolishing hundreds of historic buildings to create 85 miles of traffic-friendly boulevards.

And it still works today in fast-growing emerging cities.

But in more established urban centers, significant network expansion is nearly impossible. Habitats are too dense, real estate too expensive, finances too fragile.

Our city's vascular system is becoming clogged and sick and needs attention.

Our current thinking does not work.

We need new sources of inspiration to keep our traffic running smoothly.

After working in the transportation industry for 16 years, my “aha” moment happened while talking to a biotech customer.

She told me how her treatments take advantage of specific properties of our vascular system.

"Wow," I thought. “Our vascular system — every vein and artery in our body — performs logistical miracles every day.”

This is the moment when you realize that biology has been in the transportation business for billions of years.

We have tested countless solutions for moving nutrients, gases and proteins.

It is truly the most sophisticated transportation laboratory in the world.

So what if the solution to the transportation problem was within us?

What I wanted to know was, why do big cities have traffic jams every day, yet have blood in our veins for most of our lives?

And in reality, you are looking at two completely different networks.

Whether you're aware of it or not, we have 60,000 miles of blood vessels in our bodies. Its length is 60,000 miles.

That's 2.5 times the circumference of the Earth inside you.

What this means is that blood vessels are everywhere in our bodies, not just under the surface of the skin.

But if you look at our cities, yes, we have some subway systems, we have tunnels and bridges, and we have some helicopters in the sky.

But most of our traffic is concentrated above ground, on the surface of the earth.

In other words, our vascular system uses 3 dimensions inside the body, but city traffic is mostly 2 dimensional.

So what we need is to embrace that verticality.

Increase traffic if the surface grid is saturated.

This Chinese concept of a bus that can straddle traffic jams was an eye opener for new ways of thinking about space and movement within cities.

And just like with the power grid, you can go higher and stop the transport.

Tel Aviv and Abu Dhabi are talking about testing a futuristic network of suspended magnetic pods.

And we can keep climbing and keep flying.

The fact that companies like Airbus are now serious about urban air taxis tells us something.

Flying cars are finally moving out of sci-fi déjà vu and into the realm of compelling business cases.

And it's an exciting moment.

Therefore, building this 3D traffic network is one of the ways that traffic congestion can be alleviated and solved.

But that's not all.

We have to question other fundamental choices we've made, such as which vehicle to use.

Imagine a very familiar scene. It has been running for 42 minutes.

The two kids behind you are getting restless.

And you are late.

Can you see the slow car in front of you?

You always come when I'm late, right?

(Laughter) The driver is looking for a parking lot.

There are no parking lots available in this area, how did you know that?

It is estimated that up to 30% of urban traffic is caused by drivers looking for parking.

Can you see 100 cars around you?

Of those, only one is a passenger on flight 85.

Those 85 drivers could all fit in one red London bus.

So the question is, why are you wasting so much space when it's what you need most?

Why do we do this to ourselves?

Biology never does that.

The space within our arteries is maximized.

Every time your heart rate goes up, the high blood pressure literally compresses millions of red blood cells, causing a flood of oxygen and a rapid flow throughout your body.

And the small space inside the red blood cell is not wasted.

In a healthy state, more than 95 percent of the oxygen capacity is utilized.

If the vehicles we use in our cities were 95% full, can you imagine all the extra space needed for walking, biking, and enjoying the city?

The reason blood is so incredibly efficient is that our red blood cells are not specialized for any particular organ or tissue. Otherwise, there will probably be traffic jams.

No, it's shared.

They are shared by all cells in our body.

And our network is so extensive that each of our 37 trillion cells can deliver oxygen exactly when it needs it.

Blood is both a collective vehicle and an individual vehicle.

But our cities are stuck.

We are stuck in a never-ending debate about whether we should build a car-centric society or a massive public transportation system.

I think we should get over this.

I think we can create a vehicle that combines the convenience of a car with the efficiency of a train or bus.

just imagine.

You sit comfortably on a fast, smooth urban train with 1,200 passengers.

The problem with urban trains is that you may have to make 5, 10, 15 stops to reach your final destination.

What if this train didn't have to stop?

In this train, the wagons dynamically decouple during travel to become driverless express buses that travel on a secondary road network.

So, without a single stop and without a long transfer, you are now sitting on the bus to the suburbs.

Then, as you approach, the sitting section detaches and you are automatically driven to your doorstep.

It is both collective and personal.

This could be one of the shared modular self-driving cars of the future.

now ...

In the same way that just walking through a city full of drones, flying taxis, modular buses, and suspended magnetic pods isn't exotic enough, I think there's another force at work that makes urban transport alluring.

If you think about it, the current generation of self-driving cars is just trying to get into a transportation network built by humans for humans.

They are trying to learn relatively simple traffic rules, but deal with the more difficult human unpredictability.

But what happens when an entire city is deserted?

Do you need traffic lights?

Do you need lanes?

What about speed limits?

Red blood cells are not flowing in the lane.

They never stop at red lights.

In the first self-driving city, there were no red lights and no lanes.

And when all cars are unmanned and connected, everything becomes predictable and reaction times are minimal.

They can drive much faster and take reasonable initiative that can speed themselves and the cars around them.

Therefore, instead of rigid traffic rules, flow is regulated by a mesh of dynamic, constantly self-improving algorithms.

The result is a bizarre traffic that mixes the fast, smooth rigors of German autobahns with the creative vigor of Mumbai crossroads.

(Laughter) Traffic will be functionally active.

It becomes liquid like our blood.

And in a strange paradox, the more robotized our transportation network is, the more organic and animated its movements feel.

Yes, biology has all the attributes of today's transportation genius.

But this process took billions of years and went through all kinds of iterations and mutations.

We cannot wait billions of years for our transportation system to evolve.

We now have the dreams, concepts and technologies to build 3D transportation networks, invent new vehicles and change the course of cities.

let's do it.

thank you.

(applause)

How many of you have seen the Alfred Hitchcock movie The Birds?

Is there anyone who saw that and was really surprised?

You may want to leave now.

(laughs) This is a crow vending machine.

Over the past few days, many of you have been asking, "How did you get to this point? How did you start doing this?"

Like many great and hard-to-get ideas, it started at a cocktail party.

We were sitting there and he was complaining about crows all over the yard and wreaking havoc.

And he told me that these things are causing chaos and we should eradicate and kill these things.

I said it was silly and maybe we should train them to do something useful.

And I'm sure I'm well acquainted with feeling it's very annoying when someone tells you it's not possible.

(Laughter.) And after 10 years of this, my wife said, 'We have to do what you were talking about, and we have to build a vending machine.'

So I did.

But one of the reasons I found this interesting is that I started to realize that while we know so much about all the species that are going extinct on the planet as a result of the expansion of human habitation, no one seems to be paying attention to all the species that are actually alive. they survive.

And I'm talking specifically about commensal species that are particularly adapted to human ecology, species like rats, cockroaches, and crows.

And when I started observing them, I realized they were over-adapting.

They were very adept at living with us.

And in return we always tried to kill them.

(Laughter.) By doing so, we were breeding them for parasitism.

We were giving them all sorts of reasons to adapt new methods.

Rats, for example, are incredibly sensitive breeding animals.

And as anyone trying to get rid of cockroaches knows, they are completely immune to the venom we use.

So I decided to build something mutually beneficial. We can both benefit and find ways to form new relationships with these species.

I built a vending machine there.

But knowing more about crows makes the vending machine story a little more interesting.

It turns out that crows don't just live with humans. they are actually thriving.

It is found everywhere on Earth except the Arctic and the southern tip of South America.

And throughout the region, they are rarely found breeding more than five kilometers from humans.

So we may not be thinking of them, but they are always around.

And not surprisingly, given population growth, more than half of humanity now lives in cities.

And of that, 9/10 of the population growth is happening in cities.

So the bird numbers show that their numbers may be growing exponentially.

So it's not all that surprising.

But what was really interesting to me was discovering that the birds adapted in a rather unusual way.

Here is an example.

This is Betty. Crow from New Caledonia.

And these crows, in the wild, use sticks to catch insects and other things from pieces of wood.

Here she is trying to get a piece of meat out of the tube.

But the researchers had a problem.

They messed up and left just a bar of wire in there.

You see, it wasn't working very well.

So she adapted.

Well, this one is completely promptless. She had never seen this done before.

No one taught her how to bend this into a hook, and no one taught her how that happens.

So remember -- she never saw this done.

(laughs) Yes.

(Laughter) Right. have understood.

(Applause.) That's where researchers are panicking.

(Laughter) After all, I'm finding out more and more that crows are really smart.

Their brains have the same proportions as chimpanzee brains.

There are all sorts of anecdotes about the different kinds of intelligence they possess.

For example, in Sweden, crows wait for fishermen to drop fishing lines into ice holes.

And when the fishermen go away, the crows jump down and reel up the line to eat the fish and bait.

Quite annoying for anglers.

In a completely different way, a few years ago, the University of Washington was experimenting with catching crows on campus.

Some students went outside, caught a crow with a net, brought it in, weighed it, and released it outside.

And they had a lot of fun discovering that for the rest of the week, every time certain students walked around campus, crows were crowing at them and running around, making their lives kind of miserable.

(Laughter) As this continued for the next week, they became less interesting.

They finally graduated and left campus, and—they must have happily run away—until they returned some time later and realized that the crows still remembered them.

(Laughter) It's morally important not to offend the crows.

So now, students studying these crows at the University of Washington are doing their research wearing giant wigs and large masks.

(laughs) It's pretty interesting.

(Laughter) We know this crow is really smart, but the more we look into this, the more we realize that it's actually doing some more important adaptations.

Video: Crows are very adept at making a living in these new urban environments.

This Japanese city has devised a way to eat food that would normally be unmanageable. That's to drop it in the car's car.

The problem is retrieving the debris without being run over.

Wait until the traffic light stops the traffic at the traffic light.

Then safely retrieve the cracked nut.

(Laughter) (Applause) Joshua Klein: Well, that's very interesting.

The point about this isn't that crows use cars to crack nuts.

Actually, this is an old hat for crows.

This happened about 10 years ago at a place called Sendai, a driving school near Tokyo.

And since then all the crows in the neighborhood have taken this action.

All the crows within five kilometers are now standing by the sidewalk, waiting to receive their lunch.

So they are learning from each other. And research backs this up.

It's like parents teaching their children.

If I have a little more time, I'll tell you about the case of Crow's infidelity which explains it well.

As we heard yesterday, it's a Pandora's Box that's plunging humanity into a predicament, and we're starting to see that in humanity as well.

They can adapt very quickly and flexibly to new challenges and new resources in their environment. This is very useful if you live in a city.

So you can see that there are many crows.

It turns out they are really smart and can teach each other.

When all this was revealed, I realized that the only obvious thing to do was build a vending machine.

that's what we did.

It also uses skinnerian training to shape behavior across four stages.

It's very simple.

Basically what happens if you put this in a field or where there are a lot of crows.

Place coins and peanuts around the bottom of the machine.

Crows eventually come and eat the peanuts, getting used to the machine being there.

They end up eating all the peanuts.

Then, when he sees the peanuts on the feeder, he jumps up and helps.

They then leave and the machine spits out more coins and peanuts. And if you're a crow, life is great - you can always come back and get some peanuts.

So once they're really comfortable with it, we move on to the crows coming back.

Now they are used to the sound of machines. They come back again and again to dig out the peanuts from the pile of coins there.

We interrupt them when they are really happy about this.

Proceed to the third stage. They only give coins there.

Now, like most of us who are used to good things, this really pisses them off.

So they do the same things they do in nature when looking for something. That is, it brushes away anything that does not get in its way with its beak.

They do it here whereby the coin drops into the slot.

When that happens, they get peanuts.

This goes on for a while.

The crows learn that all they have to do is show up, wait for the coin to come out, put it in the slot and get the peanut.

Once they are doing well and happy with it, move on to the final stage. There they show up, but nothing happens.

Here you can see the difference between crows and other animals.

Come back, find some peanuts, and walk away.

They repeat this maybe six times until they get bored, and then they start playing in the traffic jam.

Meanwhile, a crow appears and tries to figure it out.

They know that this machine has thwarted them through three different stages of operation.

(Laughter.) They think it must mean more than that.

So they peck it and peck it.

And finally Crow comes up with a good idea. “There are a lot of coins rolling around from the first stage, so I jump down, pick them up, drop them into the slots, and go racing.

The crow enjoys a temporary monopoly on peanuts until his friends find a way to do it.

So the point about this to me is not that you can train a crow to pick up peanuts.

Let me tell you, with $216 million worth of loose change lost each year, I'm not sure I can count on Crow's ROI.

(Laughs) Rather, I think we should look a little bigger.

I think crows can be trained to do other things as well.

For example, train them to pick up trash after stadium events.

Or do you find expensive components in discarded electronics?

Or do you do search and rescue?

The point of all this for me is that we can find mutually beneficial systems for these species.

We can find ways to interact with these other species. The method involves finding an equilibrium point that is a beneficial balance with them, rather than annihilating them.

Thank you very much.

(applause)

I would like to start with an experiment.

Play three rainy day videos.

However, I replaced the audio in one of the videos and added the sound of frying bacon instead of the sound of rain.

So think carefully about which clip contains the bacon.

(It's raining) (It's raining) (It's raining) Okay.

Actually, I lied.

They are all bacon.

(Bacon grilling) (Applause) My point here is not to make you hungry every time you see a rainy scene, but to show that our brains are conditioned to accept lies.

We are not looking for accuracy.

So I would like to quote one of my favorite authors on the subject of deception.

Oscar Wilde, in The Decline of Lies, established the idea that all bad art stems from being imitation and realistic of nature. And all great art is born out of lies and deceit and telling beautiful and false things.

So if you're watching a movie and the phone rings, it's not actually ringing.

It was added later in post-production in the studio.

Any sound you hear is fake.

Everything but the dialogue is fake.

When you're watching a movie and you see a bird flapping -- (flapping) they don't really record what the bird is doing.

Recording sheets or trembling kitchen gloves sounds more realistic.

(pattering) Cigarette burning up close -- (burning cigarettes) In fact, picking up a small saran wrap ball and releasing it makes it sound more real.

(saran warp ball is released) Punch?

(Punches) Oops, let me try again.

(Punch) It is often done by sticking a knife into a vegetable, usually cabbage.

(Stabbing the cabbage with a knife) Next comes the painstaking work.

(broken bones) Well, no one was hurt.

It's actually...

Fold celery or frozen lettuce.

(Cracking frozen lettuce or celery) (Laughter) Getting the right sound isn't as easy as going to the vegetable section of the supermarket.

But it's often much more complicated than that.

Let's reverse engineer the creation of sound effects together.

One of my favorite stories is by Frank Seraphine.

He's a contributor to our library and a great sound designer for Tron, Star Trek, and more.

He was part of the Paramount team that won the Oscar for Sound for "The Hunt for Red October."

In this Cold War classic, I was commissioned to make the sound of a submarine propeller in the 90's.

They had a small problem there. We couldn't really find a submarine in West Hollywood.

Basically, what they did is go to a friend's pool and Frank showed off a cannonball, or bomba.

They set up underwater and overhead mics outside the pool.

This is what an underwater microphone sounds like.

(Underwater plunge) After adding an overhead mic, it sounded like this: (water splash) So they took the sound and pitched it down an octave, kind of like slowing down a record.

(water splatters in the lower octaves) and much of the high frequency has been removed.

(Water splashes out) And I lowered it another octave.

(An octave down splash) and added a little splash from the overhead mic.

(splashing water) And by looping and repeating that sound, we got: (sound of spinning propellers) We used a combination of creativity and technology to create the illusion that we were inside a submarine.

But once you've created your sounds and synced them to your images, you'll want to bring them to life in the world of your story.

One of the best ways to do that is by adding reverb.

This is the first audio tool I want to talk about.

Reverberation, or reverb, is the continuation of sound after the original sound ends.

So it's like all the reflections off the materials, objects, and walls around the sound.

For example, consider the sound of a gunshot.

The original sound is less than 0.5 seconds long.

(Gunshot) Add reverb to make it sound like it was recorded in the bathroom.

(Gunshot reverberations in the bathroom) Or something like it was recorded inside a chapel or a church.

(church with echoes of gunshots) or in a canyon.

(Canyon Gunshot Reverb) So the reverb gives us a lot of information about the space between the listener and the original sound source.

If sound is the taste, reverb is like the smell of the sound.

But reverb can do much more.

Hearing a sound that is much less reverberating than the on-screen action quickly indicates that you are listening to a commentator not participating in the on-screen action, the objective narrator.

Also, emotionally intimate moments in movies can often be heard without reverb. Because that's what it sounds like when someone is talking in your ear.

Quite the opposite, adding a lot of reverb to your voice can create the illusion of hearing a flashback, or being inside a character's head, or hearing God's voice.

Or an even more powerful figure in the movies, Morgan Freeman.

(Laughter) So -- (Applause) But what are some other tools and hacks that sound designers use?

Now, here's the really big one.

It's silence.

A little silence draws our attention.

And in the Western world, we are not very accustomed to verbal silence.

They are considered awkward or rude.

So silence that precedes verbal communication can create a lot of tension.

But imagine a really blockbuster Hollywood movie with lots of explosions and automatic guns.

After a while, the loud noise will stop being loud.

So, in a yin-yang way of thinking, silence needs volume and volume needs silence for either to be effective.

But what does silence mean?

Well, it depends on how it's used in each movie.

Silence can put us inside a character's head or trigger a thought.

We often associate silence with things like...

contemplation, meditation, deep thought.

But silence, apart from having one meaning, becomes a blank canvas on which the viewer is invited to paint his thoughts.

But let me be clear: there is no such thing as silence.

And we know this sounds like the most bombastic statement ever made on a TED talk.

But even if you walk into a room with zero reverberations and zero outside noise, you'll still hear your own blood pumping.

And traditionally in movies there were no moments of silence because of the sound of the projector.

And even in today's world of Dolby, there's never a moment of silence if you listen to the music around you.

There will always be some noise.

Now, since there is no such thing as silence, what do filmmakers and sound designers use?

Well, as a synonym, ambience is often used.

Ambience is the unique background sound specific to each location.

Each location has a unique sound and each room has a unique sound called room tone.

This is a record for the Moroccan market.

(voices, music) And this is a recording in Times Square, New York.

(Traffic sounds, car horns, voices talking) Interior sound is the sum of all noises in the room, such as ventilation, heating, refrigerators, etc.

This is a record of my apartment in Brooklyn.

(Ventilation, boiler, refrigerator, road traffic sounds) Ambience works in the most primitive way.

They can speak directly to our brains subconsciously.

So birds chirping outside the window could be a sign of normality. Perhaps it's because, as a species, we've been used to that sound every morning for millions of years.

(Birds chirping) Industrial sounds, on the other hand, have been introduced to us a bit more recently.

I personally love it, but industrial sounds have been used by one of my heroes, David Lynch, and his sound designer, Alan Spread. Industrial sound is often associated with negative connotations.

(mechanical sound) Well, sound effects can tap into our emotional memory.

In some cases, they become so important that they become characters in movies.

The sound of thunder can indicate divine intervention or wrath.

(thunder) Church bells can remind us of the passage of time, or our own death.

(The bell rings.) And breaking the glass can indicate the end of a relationship or friendship.

(Glass breaks.) Scientists believe that dissonant sounds, such as brass or wind instruments played very loudly, remind us of animal howls in nature, which can cause irritation and fear.

(Brass and wind instruments play) Now, we talked about on-screen sounds.

However, in some cases, the source of the sound may not be visible.

That's what we call off-screen sound, or 'acoustic'.

Acoustic Sound -- Well, the term "acoustic" comes from the ancient Greek Pythagoras. Pythagoras did not reveal his true identity to his disciples, teaching for many years behind veils and curtains.

I think this mathematician and philosopher thought that his students might pay more attention to his voice, his words and their meaning, than the visual things he was saying.

Something like The Wizard of Oz or 1984's Big Brother, separating the voice from its source, separating cause and effect, creates a certain sense of universality, panopticism, and even authority.

Acoustic sound has a strong tradition.

The nuns of Roman and Venetian monasteries sang in the cloister rooms near the ceiling, giving the illusion of hearing the voices of angels in the sky.

Richard Wagner famously created a hidden orchestra placed in a hole between the stage and the audience.

And one of my heroes, Aphex Twin, famously hid in the dark corners of clubs.

I think what all these masters knew was that hiding sources creates a sense of mystery.

This has been seen many times in movies, including Hitchcock and Ridley Scott's "Alien."

Hearing a sound without knowing its source creates a certain tension.

It also minimizes certain visual limitations that directors have, allowing us to see things that weren't there during filming.

This may sound a bit theoretical, but I'd like to play a little video.

(Squeak of toy) (Squeak of typewriter) (Sound of drum) (Sound of ping-pong) (Sound of sharpening knife) (Scratches on record) (Saw cut) (Woman screaming) What I am trying to demonstrate with these tools is that sound is language.

You can trick us by moving us geographically. You can change your mood. It can set the pace. It can make us laugh or it can scare us.

On a personal level, I fell in love with the language a few years ago and managed to find some sort of career.

And I think we're trying to extend the language's vocabulary through our work through the sound library.

As such, we want to give sound designers, filmmakers, video game and app designers the right tools to keep telling better stories and creating more beautiful lies.

Thank you for your attention.

(applause)

(music) I went to St. James's Infirmary I went to see the baby The baby was lying on a long wooden table So cold and quiet and so beautiful I went to see the doctor "I'm so sick" he said Joe Mackennedy was standing His eyes red and bloodshot He turned to the crowd around And these are the words he said "Let her go, let her go God bless her wherever she is She can search this wide world But she can search this wide world And she'll never find someone like me When I die please God give me ten bucks" Put a $20 gold piece on my watch chain So my friends know I died standing So let six gamblers carry the coffin Let six choir girls sing Let me sing a song Jazz band on the hearse wagon To heat up hell That's all I'm talking about Let's have another drink And if anyone asks you St. James's (Applause)

I am here today to tell you about a very powerful little word. People will do whatever it takes to keep that from happening.

A multi-billion dollar industry thrives on fear, and those of us who are undeniably terrified must weather the unrelenting storm that surrounds it.

I don't know if anyone has noticed, but I'm fat.

It's not the type that mutters in lowercase, or the seemingly harmless chubby, cuddly type.

I'm not even the sophisticated, sensual, curvaceous type.

Don't sugar coat.

I'm a capital F-A-T fat type.

I am the elephant in the room.

When I walked on stage, some of you might be thinking, "Oh, this is going to be funny, because we all know fat people are funny."

(Laughter) Or maybe you've thought, "Where does she get her confidence from?"

Because a confident fat woman is almost unthinkable.

The fashion-conscious audience may have wondered how awesome I look in this Beth Ditto dress -- (Cheers) Thank you.

On the other hand, some of you may be thinking, "Well, if I was black, I'd be thinner."

(Laughter) Consciously or not, you may have wondered if I have diabetes, have a partner, or eat carbs after 7pm.

(Laughter) You may be worried that you really need to renew your gym membership because you ate carbs after 7pm last night.

Such judgments are insidious.

They can be directed at individuals and groups, but they can also be directed at ourselves.

And this way of thinking is known as fatphobia.

Like all forms of systemic oppression, fat phobia is deeply rooted in complex structures such as capitalism, patriarchy and racism that can make it very difficult to understand, let alone challenging.

We live in a culture where being fat is seen as a bad person, lazy, greedy, unhealthy, irresponsible and morally questionable.

And we tend to think that being thin is a universally good thing: being responsible, successful, and in control of your appetite, body, and life.

We see these ideas again and again in the media, public health policies, clinics, everyday conversations, and in our own attitudes.

After all, we might even blame fat people themselves for the discrimination they face because if you don't like it, you can lose weight.

easy.

This anti-fat bias is so ingrained in how we evaluate ourselves and each other that we rarely wonder why we have such disdain for larger people and where that disdain comes from.

But we have to question it. Because the very big values ​​of how we look affect each one of us.

And do we really want to live in a society where people are denied basic humanity unless they agree to some form of arbitrary acceptance?

So when I was six years old, my sister was teaching ballet to a bunch of little girls in the garage.

I was a foot taller and a foot wider than most people in the group.

When it came time to perform for the first time, I was so excited to wear a cute pink tutu.

I was going to sparkle.

None of the tutu sizes were right for me, while other girls wore lycra and tulle creations with ease.

I was determined not to be left out of the performance, so I turned to my mother and said loud enough for everyone to hear. "Mom, you don't need a tutu."

I need 44. ”

(laughter) Thank you, Mom.

(Applause.) I didn't realize it at the time, but claiming my space in that glorious for-four was the first step to becoming a radical fat activist.

Now, I'm not saying that loving this whole body easily skipped the glorious path of self-acceptance since that day in class.

Far from it.

I quickly learned that living outside what the mainstream considers normal can be a frustrating and isolating place.

I've spent the last 20 years decompressing and deprogramming these messages, and it's been a roller coaster ride.

I was publicly laughed at, taunted by passing cars, and told I was paranoid.

I also get smiles from strangers who understand what it takes to walk the streets with brisk steps and high heads.

(cheers) Thank you.

And through it all, that ferocious little six-year-old stayed with me and helped me stand before you today as an unapologetic fat person, someone who simply refuses to agree to the prevailing narratives about how I should navigate the world in this body.

(Applause.) And I'm not alone.

I am part of a global community of people who actively choose to thrive with their bodies as they are, rather than passively accepting that their bodies are, and probably will always be, bigger.

People who respect our strengths and work with us rather than defying our perceived limitations, people who value health as something far more holistic than numbers on outdated BMI charts.

Instead, we focus on mental health, self-esteem, and bodily sensations as important factors for our overall well-being.

People who refuse to believe that living with such a fat body is a barrier to anything.

There are doctors, academics and bloggers who have written countless books on different aspects of this complex subject.

There are fashionistas who take back their bodies and their beauty by wearing fatkinis and crop tops, exposing the flesh we've been taught to hide.

There are fat athletes who run marathons, teach yoga, and kickbox, all keeping the middle finger up and status quo.

And these people have taught me that radical body politics is the antidote to our body-shaming culture.

But to be clear, I'm not saying people don't have to change their bodies if they want to.

Reclaiming yourself is one of the greatest acts of self-love, and it looks like a million different things, from hairstyles, tattoos, body contours, hormones, surgery, and even weight loss.

It's easy. It's your body and you decide what's best to do with it.

My approach to action is to do all the things we fat guys shouldn't do. There are many such things, but inviting others to join me and making art about it.

What this work has in common is the re-use of spaces that are inaccessible to large bodies, from catwalks to club shows, from public swimming pools to prominent dance stages.

And reusing space en masse is not only a powerful artistic expression, but also a radical community-building approach.

So was "AQUAPORKO"! -- (laughter) A fat women's synchronized swimming team that I started with a group of friends in Sydney.

Don't underestimate the impact of seeing a group of rebellious fat women in floral swim caps, or beachgoers who don't mind throwing their legs in the air.

(Laughter.) Throughout my career, I've learned that fat bodies are inherently political, and that unapologetic fat bodies can surprise people's minds.

When Kate Champion, director of the acclaimed dance theater company Force Majeure, asked me to be an artistic collaborator on a production featuring fat dancers, I literally jumped at the opportunity.

And I mean it literally.

'Nothing to Lose' is a collaboration of big performers drawn from lived experience to create a work as diverse and authentic as all of us.

And it was as far from ballet as you could imagine.

The very idea of ​​a fat dance piece by such a prestigious company was controversial to say the least. Because no such production has ever been performed on a mainstream dance stage before anywhere else in the world.

People were skeptical.

"What do you mean by 'fat dancer'?"

Where did they do their dance training?

Do they have the stamina to make feature length films? ”

But despite skepticism, 'Nothing to Lose' was a sold-out hit at the Sydney Festival.

We have been acclaimed, toured, awarded and written in over 27 languages.

These amazing images of our cast have been seen all over the world.

I can't count the number of times people of all sizes have told me that this show changed their lives, how it helped them change their relationship with their bodies and that of others, and how it helped them confront their own prejudices.

But, of course, the job of pushing people's buttons is not without its detractors.

It is said to glorify obesity.

I have received violent death threats and abuse for deliberately creating work that centers on the bodies and lives of fat people and treats us as worthy human beings with stories worth telling.

I've even been called "the ISIS of the obesity epidemic". (laughs) It's funny because it's such a ridiculous comment.

But it also speaks of the panic, the literal fear, that the fear of fat evokes.

It is this fear that fuels the diet industry and prevents many of us from reconciling with our bodies, waiting for later pictures before we can truly start living our lives.

Because the real elephant in the room here is fatphobic.

Fat activists refuse to experience this horror.

By advocating for self-determination and respect for all of us, we can change a society reluctant to embrace diversity and start celebrating the myriad ways to have a body.

thank you.

(applause)

In the spring of 2016, the legal battle between Apple and the Federal Bureau of Investigation grabbed the world's attention.

Apple builds security features into its mobile products to protect data on the device from users other than the owner.

That means criminals, hackers, and even governments are all shut out.

For Apple customers, this is great.

But the government is not so happy.

As you know, Apple made a conscious decision to get out of the surveillance business.

Apple has tried to make surveillance as difficult as possible for governments and other parties.

There are actually two smartphone operating systems in the global smartphone market: iOS and Android.

iOS is made by Apple. Android is made by Google.

Apple has spent a great deal of time and money making sure its products are as secure as possible.

Apple encrypts all data stored on iPhones by default, and text messages sent from one Apple customer to another Apple customer are encrypted by default without you having to do anything.

What this means is that if the police seize your iPhone and you put a password on it, even if you can get your data out of it, it will be difficult to get your data out of it.

In contrast, Android security isn't really that good.

Android smartphones, or at least most Android smartphones sold to consumers, do not encrypt data stored on the device by default, nor does Android's built-in text messaging app.

Therefore, if the police seize an Android smartphone, they may be able to retrieve all the data they need from the device.

Two smartphones from two of the world's biggest companies. Which protects your data by default and which does not.

Apple is a luxury goods seller.

Dominating the high-end market.

And manufacturers of luxury goods are expected to come out with more features.

But not everyone can buy an iPhone.

That's where Android really dominates. At the middle and low end of the market, smartphones for the 1.5 billion people who can't or won't spend $600 on a phone.

But Android's dominance has created what I call the "digital security divide."

In short, there is a growing gap between the privacy and security of the wealthy who can afford devices that protect their data by default, and the poor, who have few features that protect their data by default.

So consider the average Apple customer: bankers, lawyers, doctors, politicians.

These people now increasingly carry smartphones in their pockets that encrypt calls, text messages and all data on the device without doing anything to protect their information.

In contrast, the poor and most vulnerable in our society use devices that leave them completely vulnerable to surveillance.

In the United States, where I live, African Americans are more likely to be viewed as suspicious and profiled, and are more likely to be subject to state surveillance.

However, African Americans are disproportionately likely to use non-functioning Android devices to protect themselves from surveillance.

This is a problem.

Remember, monitoring is a tool.

It is a tool that the powerful use against the powerless.

I think it's pretty cool that companies like Apple make it easy for people to encrypt, but if only the rich and powerful can protect themselves from government scrutiny, that's a problem.

And it's not just a privacy or cybersecurity issue.

It's a civil rights issue.

So Android's lack of default security isn't just a problem for the poor and vulnerable users who rely on these devices.

This is actually a problem for our democracy.

I'll explain what it is.

Modern social movements rely on technology, from Black Lives Matter to the Arab Spring to Occupy Wall Street.

Organizers and participants in these movements are increasingly using smartphones to communicate and collaborate.

So, of course, threatened governments will also target organizers and their smartphones.

Well, it's entirely possible that a future Martin Luther King, Mandela, or Gandhi will have an iPhone and be protected from government surveillance.

But they probably have a cheap $20 Android smartphone in their pocket.

So if we do nothing to address the digital security gap, to ensure that everyone in society can benefit from encryption alike and be protected from state surveillance, not only will the poor and vulnerable be exposed to surveillance, but future civil rights movements may be crushed before they reach their full potential.

thank you.

(Applause) Helen Walters: Thank you very much, Chris.

I have a question.

We recently saw Facebook's Mark Zuckerberg in the press covering his camera and doing something with his headphone mic jack.

So I wanted to ask you a personal question, which is "Do you do that?"

And on behalf of everyone here, especially me, should we?

Should these things be brought up?

Christopher Soghoian: Sticking stickers -- I actually like band-aids. Because you can peel and re-stick whenever you want to make a call or Skype call.

Putting a sticker on your webcam is probably the best thing you can do for privacy from a cost-effectiveness standpoint.

Malware, malicious software, can hijack your webcam even if the lights aren't on.

This is what criminals use. Stalkers use this.

You can buy the $19.99 “Spy on Ex Girlfriend” software online.

It's really scary.

And, of course, it is also used by governments.

And there is clearly an element of sexual violence in this. This means that this type of surveillance may be most effectively used against women and others who may be stigmatized in society.

Even if you think you have nothing to hide, at least if you have kids or teens, try to protect them by putting stickers on your camera.

HW: Wow. Thank you very much. CS: Thank you.

HW: Thank you Chris.

(applause)

For over a decade, I have studied so-called "dropouts" of young people who have been kicked out of school.

Their failure in the education system exposes them to street violence, police harassment, police brutality and imprisonment.

I track these young people in institutions for years at a time, trying to understand what some people call the "school-to-prison pipeline."

When I see pictures like these of young people in my study...

Trouble may occur.

So one of the boys has a bottle of liquor in his hand. He is 14 years old and today is school day.

Others may look gangsters, thugs, delinquents, and criminals when they see this photo.

But I think it is different.

I look at these young people in terms of the assets they bring to the education system.

Will you work with me to change the label of young people from 'at risk' to 'promised'?

(Applause.) How can we know that these young people have the potential and promise to change?

I am one of them, so I understand.

As you know, I grew up without a father in extreme poverty in the inner city. He abandoned me before I was born.

We were on welfare, homeless at times and starved many times.

By the time I was 15, I had been jailed 3 times in Juby for 3 felonies.

My best friend had already been killed.

And soon, my uncle was shot while I was standing next to him.

And after waiting for over an hour for the ambulance to arrive...

He bleeds to death on the street.

I had lost faith and hope in the world and had given up on the system because it had failed me.

I had nothing to offer and no one had anything to offer me.

I was fatalistic.

I never thought I would reach my 18th birthday.

I am here today because a caring teacher reached out and succeeded in drawing out my soul.

This teacher, Mr. Russ...

She was the kind of teacher who always thought of you.

(Laughter) She was a teacher who was like, 'Victor, I'm always here for you when you're ready.

(Laughter) I wasn't ready.

But she understood one basic principle about young people like me.

We are like oysters.

We will only open when we are ready, and if you are not there when we are ready, we will rush back.

Russ picked me up.

She was culturally appropriate and respectful of my community, people and family.

I told her about Uncle Ruben.

He took me to work with him because I was broke and he knew I needed money.

He earned his living by collecting glass bottles.

I threw a glass bottle in the back of his van at 4am on a school day and it broke.

My hands and arms started to bleed, and my tennis shoes and trousers were covered in blood.

And I quit my job out of fear and pain.

And my uncle looked me in the eye and said, "Miho, Estamos Vascando Vida."

“We want a better life and we want to create something out of nothing.”

Professor Russ heard me, welcomed me into the classroom, and said, "Victor, this is your power.

Here are your possibilities.

Your family, culture, and community have taught you an ethic of hard work, and you will be able to use it to empower yourself in academia and come back to empower your community. ”

With Rath's help, I was finally able to go back to school.

I also completed my credits on time and graduated from the class.

(Applause.) But just before graduating, Mr. Russ said to me, "Victor, I'm so proud of you.

I knew you could do it.

It's time to go to college. ”

(laughs) College, me?

Hey, what is this teacher smoking thinking I'm going to college?

I applied for the mentorship and support she provided and received a letter of acceptance. The paragraph read, "You entered the school during the probationary period."

I said, "Suspended? I'm already on probation, does that matter?"

(Laughter.) It was academic probation, not criminal probation.

But what do teachers like Mr. Russ do to help young people like the ones I study succeed?

I suggest three strategies.

First, let's get rid of the deficit perspective in education.

"These people come from a culture of violence, a culture of poverty.

These people are in danger. These people are out of school.

These people are empty containers into which we store our knowledge.

They have problems, but we have solutions. ”

number two.

Cherish the stories young people bring into the school building.

Their stories of overcoming insurmountable difficulties are very powerful.

And I think you know some of these stories too.

These very same stories and experiences already have grit, personality and resilience.

So help young people refine those stories.

Help them be proud of themselves as our education system welcomes their family, culture, community and skill sets learned to survive.

And, of course, the third and most important strategy is resources.

We must provide young people with adequate resources.

You can't win with guts alone.

Sit there and tell me as much as you like, "Hey, get your bootstraps on."

But if I was born without straps on my boots -- (Laughter) how would I recover?

(Applause) Training, mentoring, counseling...

Teaching young people to learn from their mistakes instead of criminalizing them, dragging them out of the classroom like animals.

how about this?

I am proposing restorative justice in every high school in America.

(Applause.) So we went out with 40 young people who had been expelled from school to test these ideas in the Watts community in LA.

William was one of them.

William was the kind of kid who had been labeled with all sorts of labels.

He was a dropout, a gang member, and a criminal.

And when we met him he was very resistant.

But I remember Mr. Russ often saying.

"Hey, I'll be here whenever you're ready."

(Laughter) So over time, over time, he started to open up.

And I remember the day he made the switch.

We were in a large group, and a young woman in the program was weeping as she told the powerful story of her father being killed and her body published in the papers the next day.

And because she's crying I don't know what to do, so I gave her space and William had had enough.

He slammed his hands on the desk and said, "Hey guys! Group hugs! Group hugs!"

(Applause.) This young woman's tears and pain turned into joy and laughter knowing her community was supporting her. William has now learned that he has a purpose in life. It is to help heal the souls of the people in my area.

He told us his story.

We've refined his story from a victim's tale to a survivor's tale overcoming adversity.

We cherished it.

William graduated from high school, got his security guard certification to become a security guard, and now works for his local school district.

(Applause.) Ms. Russ' credo -- her credo has always been, "Teach the heart, and the heart will follow."

The great writer Khalil Gibran said, "Out of suffering emerged a great soul.

Huge characters have scars. ”

We believe that in this educational revolution we are talking about, we need to bring in the souls of the young people we work with. And if they can hone—recognizing the grit, resilience, and character they have already developed—then their academic performance will improve.

Believe in young people.

Give them the right kind of resource.

I will tell you what my teacher did for me.

She believed in me so much that she tricked me into believing in herself.

thank you.

(applause)

I would like to talk about my children.

Now I know everyone thinks their child is the nicest, most beautiful child who has ever lived.

But in my case it really is.

(Laughter) I have 696 children, and they are some of the most intelligent, inventive, innovative, bright and powerful children I have ever met.

All the students I have had the honor of teaching in my classroom are my children.

But I would argue that their “real” parents are not wealthy, and because most of them are people of color, they rarely see themselves in the kind of greatness that I see in them.

Because what I see in them is myself or would have been me.

I am the daughter of hardworking, college-educated African-American parents who have chosen a career in the civil service. My mother is an educator.

Wealth was never the primary goal in our home.

Because of this lack of wealth, we live in a wealthless neighborhood, and the school system has since become wealthless.

Luckily, though, we hit the educational jackpot with a voluntary desegregation program that busses urban kids (black and brown) to suburban schools (rich and white).

At the age of 5, I had to travel an hour on a bus to a faraway place to get a better education.

When I was five years old, I thought everyone had the same life as me.

Everyone went to school and I thought I was the only one using brown crayons to color their family portraits and everyone else was using peach crayons.

When I was five years old, I thought everyone was just like me.

But as I got older, I started noticing things like: "Why don't my neighbors wake up at 5am and go to school an hour away?"

My neighbors don't even go to music school, so why am I learning the violin?

Why were my friends in the neighborhood learning and reading what I did a few years ago?

As I got older, I started to feel in my stomach that I was doing something I shouldn't be doing. To bring something that does not belong to you. I received a gift, but it had someone else's name on it.

All these amazing things I was exposed to and going through felt like I really shouldn't have gone through them.

I wasn't supposed to have a library, a well-equipped exercise facility, or a safe playground.

It was never envisioned to have a theater department with seasonal plays and concerts: digital, visual and performing arts.

There weren't supposed to be well-resourced biology or chemistry labs, school buses to take you door-to-door, fresh school lunches, or even air conditioning.

These are incomprehensible to my children.

As you know, as I got older, I was grateful for the wonderful opportunities that were given to me, but there was always that pain in my heart, "But what about other people?"

There are thousands of other children who deserve this just like me.

Why doesn't everyone understand this?

Why is quality education only available to the wealthy?

It felt like a sort of survivor's regret.

All my friends in the neighborhood had an educational train accident, but I survived by taking the bus.

I was like educated Moses shouting, "Let my people go..."

Go to a quality school! ”

(laughter) I've seen firsthand how the other half is treated and educated.

I have seen the promised land of education, but I have never been able to justify its disparities in my lifetime.

I now teach in the same school system that I took refuge in.

I know firsthand the tools I was given when I was a student, but now that I am a teacher, I don't have access to the same tools that I give my students.

There have been countless nights when I cried with frustration, anger, and sadness because I couldn't teach my kids the way I was taught, and didn't have access to the same resources and tools that I used to teach them.

My kids deserve better.

We sit and keep banging our heads on this word. "Accomplishment Gap, Achievement Gap!"

Is it so hard to understand why these kids are doing well and these kids are doing poorly?

I mean, really.

I think we are doing it all wrong.

As Gloria Radson-Billings puts it, I think we should flip the paradigm and the language upside down and call it what it really is.

It's not about achievement. It is an educational debt, for all the forgotten schooling resources that have long been uninvested in educating black and brown children.

A little-known secret of American history is that the only American institution designed specifically for people of color is the American slave trade. Some people will argue about the prison system, but that's another TED talk.

(Laughter.) The public school system in this country was built, bought, and paid for using the slave trade and commerce generated from slave labor.

African Americans were enslaved and banned from schooling, but their labor established the very system that excluded them.

Since then, every trial, educational policy, and reform has been an attempt to improve design, rather than just stop and acknowledge. So we got everything wrong from the beginning.

An oversimplification of American educational history.

OK, please be patient.

Black people were kept out, I mean, so is the whole of slavery.

With the help of philanthropic whites, they built their own schools.

It was OK to be separate or equal.

But we all know that while things were certainly separate, they were never equal.

In 1954, the Brown v. Board of Education case occurred in Topeka, Kansas. Legal segregation of race is now illegal.

But few pay attention to all the subsequent trials that void Brown v. Bode's promise of education for all of its intended children.

Some would argue that today our schools are even more racist than they were before we first attempted desegregation.

Teaching kids about desegregation, Little Rock Nine, and the civil rights movement is a real awkward moment in the classroom. When you have to hear a child asking, "If schools were desegregated in 1954, why aren't there white kids here?"

(Laughter) These kids aren't stupid.

They know exactly what's going on and what's not.

They know, and never really do, that black lives matter when it comes to schooling.

For years I have tried desperately to develop a love of reading in my children.

I collected books from thrift stores, thrift stores, and attics in my modest classroom library.

But every time I say the dreaded words, "Pull out a book and read it," you'll think I've declared war.

It was torture.

One day, after hearing about DonorsChoose, a website where class teachers create wishlists of classroom-needed items and anonymous donors make it happen, I decided to take the plunge and create a wishlist for a teenager's dream library.

Over 200 brand new books were sent to my room little by little.

Every day there was a new delivery, and the children were overjoyed and said, "It's like Christmas!"

(Laughter) And then they say, 'Mr. Sumner, where did these books come from?'

And I reply, "Strangers all over the country wanted you to have this."

And they say, almost suspiciously, "But it's new."

(Laughter) And I say, "You deserve a brand new book."

The whole experience struck me when one of my daughters flipped through a crisp paperback and said:

But it's so nice to know that strangers, people I don't know, care about me this much. ”

Knowing that a stranger will take care of you is a privilege my children are not given.

Since the donation, there has been no end to the number of children who have signed the books and taken them home, exclaiming with admiration, "This is great!"

(Laughter) Now, when I say, "Get out the book and read," kids rush to my library.

It's not that they didn't want to read it, they were willing to read it if they had the resources.

Institutionally speaking, our public school system has never done the right thing for Black and Brown children.

We keep focusing on the final result or test results and get frustrated.

We encounter catastrophes and think, "How did things get so bad? How did we get here?"

TRUE?

If you neglect your child for an extended period of time, you have no right to be surprised when things go wrong.

For now, don't be embarrassed or confused or embarrassed that performance gaps, income gaps, incarceration rates, and other socioeconomic inequalities are the new "it" term.

The problems we have as a country are the problems we have created as a country.

The quality of education is directly proportional to access to college, access to jobs and access to the future.

At the macro level, there is something we can do to bring about a world in which all children have access to quality education, regardless of where they live or what color of skin they have.

Funding for schools should not be determined by property taxes and crazy economic equations where poor children continue to be deprived of food and resources while wealthy children continue to benefit from state aid.

Governors, senators, mayors, city councilors, if you call public education public education, so be it.

Otherwise, we should really call it "poverty insurance."

“Public education: keeping poor children poor since 1954.”

(Laughter) If we, as a nation, really believe that education is the 'great equalizer', it should just be equal and fair.

Until then, there is no democracy in our democratic education.

At the meso level, historically, the education of black and brown children has always depended on the charity of others.

And unfortunately it continues to this day.

If your son or daughter, niece or nephew, neighbor, or little Timmy attends a wealthy school, urge the school board to adopt poor schools and poor classrooms.

Bridge the gap by building important communications and relationships.

When resources are shared, they are not split. they are doubled.

And on a micro level, if you're human, donate.

Time, money, resources, opportunities, whatever is on your mind.

There are websites like DonorsChoose that recognize the divide and really want to do something about it.

What is a carpenter without tools?

What is an actress without a stage?

What is a scientist without a lab?

What is an unequipped doctor?

Let me tell you, they are my children.

Shouldn't they be your children too?

thank you.

(applause)

June 2010.

I landed in Rome, Italy for the first time.

I didn't come here for sightseeing.

I was there to solve world hunger.

(laughs) Yes.

I was a 25-year-old Ph.D. student armed with a prototype tool developed at university to help the World Food Program solve hunger.

So I walked into the headquarters building, saw the United Nations flags lined up, and smiled, thinking, 'The engineer is here.'

(Laughter) Give me your data.

We optimize everything.

(Laughter) Tell me the food you bought, tell me where it's going and when it needs to get there. Then I'll tell you the shortest, fastest, cheapest route to get that food.

We save money, avoid delays and disruptions, and ultimately save lives.

you're welcome.

(Laughter) I thought it would take 12 months, but hey, it might take 13 months.

This didn't quite work.

Just a few months after the project started, my French boss said to me, "You know, Mallory, that's a good idea, but the data that the algorithm needs isn't there.

It's the right idea, but at the wrong time, and using the right idea at the wrong time is the wrong idea. ”

(Laughter) The project is finished.

I was devastated.

Looking back on my first summer in Rome now, I can see how much has changed in the last six years. It's an absolute change.

The time has come to bring data into the humane world.

It's very exciting. It's impressive.

But we're not there yet.

And all executives, please be careful. Because I'm going to put companies on the hot seat and have them step up and do the roles I know they can do.

My experience back in Rome is proof that data can save lives.

OK, it wasn't my first attempt, but I got there eventually.

Let me draw a picture for you.

Imagine you need to plan breakfast, lunch, and dinner for 500,000 people, and you only have a fixed budget (say, $6.5 million per month) to do it.

So what do we do? What's the best way to deal with it?

Should I buy rice, wheat, chickpeas and oil?

ikura?

Sounds simple. it's not.

There are 30 types of food and you have to choose 5 of them.

There are already over 140,000 possible combinations.

Then, for each food item you choose, you have to decide how much to buy, where to source it, where to store it, and how long it will take to get there.

All the different transportation routes should also be considered.

And that's already over 900 million options.

Considering each option for a second would take over 28 years to resolve.

900 million options.

That's why we created a tool that allows decision makers to select all 900 million options in just a few days.

It was incredibly successful.

Operations in Iraq saved 17% of costs. This means we can feed an additional 80,000 people.

It's all thanks to the use of data and modeling of complex systems.

But we didn't do it alone.

The unit I worked with in Rome was unique.

They believed in cooperation.

They brought in academia.

They brought in companies.

And if we really want to make a big difference to a big problem like world hunger, we need everyone at the table.

What we need is data that allows humanitarian people to lead and coordinate the right types of engagement with academics and governments.

And there is one group that is underutilized as it should be.

did you guess? enterprise.

Businesses play a major role in solving some of the world's biggest problems.

I have been working for a private company for two years.

I've seen what companies can do and what companies aren't doing. I think there are three main ways to fill that gap. donating data, donating decision scientists, and donating technology to gather new data sources.

This is data philanthropy and the future of corporate social responsibility.

Plus, it makes business sense.

Companies today collect tons of data, so the first thing they can do is start donating it.

Some companies are already doing so.

For example, consider a large telecommunications company.

Researchers have released data from Senegal and Ivory Coast and found that patterns of pings to cell phone towers can tell where people are moving.

This will allow us to make predictions, such as where malaria is likely to spread.

Or take an innovative satellite company as an example.

They donated their data publicly so they can now use it to track how drought is impacting food production.

This allows aid funds to actually be activated before a crisis hits.

This is a great start.

Critical insights are locked in enterprise data.

And yes, you have to be very careful.

Privacy concerns should be respected, for example by anonymizing the data.

But even if the floodgates were opened and all companies donated their data to academics, NGOs and humanitarian aid groups, it would not be enough to maximize the impact of data for humanitarian goals.

why?

We need decision scientists to extract insights from data.

Decision scientists are people like me.

They take the data, clean it up, transform it, and turn it into useful algorithms that are the best option for your immediate business needs.

There are very few decision-making scientists in the world of humanitarian aid.

Most of them work for companies.

This is the second thing companies need to do.

In addition to donating data, decision scientists should also donate.

Now, companies will say, "Oh! Don't take the decision scientist away from us.

We need every second of their spare time. ”

But there is a way.

If a company intends to donate some of a decision scientist's time, it actually makes more sense to spread that time out over a longer period of time, say five years.

It's only a few hours a month and businesses rarely miss it, but what it enables is very important. It's a long term partnership.

Long-term partnerships allow us to build relationships, know data, really understand it, and begin to understand the needs and challenges facing humanitarian organizations.

It took Rome's World Food Program five, five years to do this.

For the first three years, it was a problem we couldn't solve.

It then took two years to refine and implement the tools, similar to operations in Iraq and other countries.

I don't think this is an unrealistic schedule when using data to make operational changes.

It's an investment. Patience is required.

But the types of outcomes that can be produced are undeniable.

In our case, it was the ability to feed tens of thousands more people.

So we donate data, we donate decision scientists. And there's actually a third way businesses can help. It's about donating technology to get new data sources.

As you know, there are many things that don't have data.

Syrian refugees are now pouring into Greece, and the UN refugee agency is overwhelmed.

The current people-tracking system is pencil and paper, which means that when a mother and five children enter the camp, headquarters are basically not looking at the moment.

All that will change in the coming weeks, thanks to private sector cooperation.

A new system is coming, based on package tracking technology donated by the logistics company where I work.

With this new system, there is a data trail so we know exactly when mothers and children enter camp.

In addition, you can also see if supplies will arrive this month and next month.

Information visibility increases efficiency.

For businesses, using technology to collect critical data is like bread and butter.

They've been doing this for years and have seen significant improvements in operational efficiency.

Imagine your favorite beverage company trying to do inventory planning and not knowing how many bottles they have on their shelves.

It's absurd.

Data drives better decisions.

Now, if you're a company president and you're a realist rather than an idealist, you might say to yourself, "Okay, this is all great, Mallory, but why should I want to be involved?"

First, beyond good PR, humanitarian aid is a $24 billion sector, with more than 5 billion people living in the developing world, who are probably our next customers.

Additionally, companies engaged in data philanthropy are discovering new insights trapped in their data.

For example, a credit card company may open a center that acts as a hub for academic institutions, NGOs, and governments, all working together.

They look at credit card swipe information and use it to find insights into how Indian households live, work, earn and spend.

For the humanitarian world, this provides information on how to lift people out of poverty.

For businesses, however, it provides insight into Indian customers and potential customers.

It's all a win.

Now, what I find interesting about data philanthropy—data donations, decision scientist donations, technology donations—is what it means for young professionals like me who choose to work for companies.

Research shows that the next-generation workforce is interested in making their work more impactful.

We want to make a difference. So through data philanthropy, companies can actually help engage and retain decision scientists.

And that's a big deal for a high-demand occupation.

Data philanthropy makes business sense and can also help revolutionize the world of humanitarianism.

Hundreds of thousands more could be fed, clothed and evacuated if planning and logistics could be coordinated across all key aspects of the humanitarian response. Companies need to step up and play the part I know I can do in bringing about this revolution.

You've probably heard the term "food for thought."

Well, this is literally meant for food.

Finally getting the right idea at the right time.

(laughs) It's so beautiful.

thank you.

(applause)

When I come to TEDx, I always think about technology and how the world is changing and becoming more innovative.

You are thinking about driverless driving.

Everyone is talking about self-driving cars these days, and I love the concept of self-driving cars, but when I actually drive, I want to go really slow and use the steering wheel and brakes just in case.

I don't know about you, but I'm not ready to introduce driverless buses.

I'm not ready for a drone.

What would a world without drivers look like?

We ask that because we are becoming more and more one.

It can't be.

We are number one and America is big and responsible.

Americanization and globalization over the last few generations have been basically the same thing.

right? Whether it's the World Trade Organization, the IMF, the World Bank, or the Bretton Woods Agreement on Currencies, these were America's institutions, our values, our friends, our allies, our money, our standards.

That was how the world worked.

So this is interesting. If you want to see what the US looks like, here it is.

This is our view of how the world operates.

President Obama walks the red carpet and exits Air Force One feeling so good and so comfortable.

Well, I don't know how many people saw last week's visit to China and the G20.

oh my god. right?

Thus we arrive at the most important conference of world leaders to be held in China.

The National Security Advisor was actually ranting on the tarmac -- not on the red carpet, but rather at the bottom of the plane with the media and everyone else.

Then the G20 has, well, Obama.

(laughs) Hello, George.

Hello Norman.

Sounds like a cage match, doesn't it?

And they did. Ninety minutes long, they talked about Syria.

That's what Putin wanted to talk about.

He is becoming more and more decisive.

He is willing to do something there.

They don't have much liking or trust in each other, but the Americans aren't telling him what to do.

What if all 20 people got together?

Indeed, when all the leaders are on stage, Americans are at their best.

Uh oh.

(laughs) Xi Jinping looks fine.

Chancellor Angela Merkel – she always does – that look, she always does.

But Putin is telling Turkish President Erdogan what to do, and Obama is like, "What's going on over there?"

you see. And the problem is, it's not the G20. The problem is that we live in a G-Zero world, a global order in which no single nation or alliance can meet the challenges of global leadership.

Neither the G20 works, nor the G7, my friends, it's history.

So globalization continues.

Goods, services, people and capital are moving across borders faster than ever before, but Americanization is not.

So, if I can convince you of that, I'd like to do two things for the rest of this story.

I want to talk about the impact it has on the whole world.

I'll go around.

And then I'd like to talk about what we're thinking here in the United States and in New York.

why? What is the impact? why are we here?

Well, we are here because the US spent $2 trillion on the wars in Iraq and Afghanistan and they failed.

We don't want to do that anymore.

We have many middle and working classes who feel they are not benefiting from the promise of globalization. That's why they don't particularly want globalization.

And we have an energy revolution that doesn't need OPEC or the Middle East like it once did.

We produce them all here in the USA.

In short, Americans don't want to be global sheriffs for security and builders of global trade.

Americans don't even want to be cheerleaders for global values.

Now when we look at Europe, the most important alliance in the world is the transatlantic relationship.

But its power is now weaker than it has been since all the crises after World War II, the Brexit talks, the hedging between France and Russia, Germany and Turkey, Britain and China.

China wants to show more leadership.

They do, but it's limited to the economic sphere, and they want their own values, standards, and currency that compete with those of the United States.

Russians want more leadership.

We see it in Ukraine, the Baltics and the Middle East, but not in America.

They want their own taste and order.

That's why we are here now.

So what will happen in the future?

Let's start easily with the Middle East.

(Laughter) I skipped a bit, but you get the gist of it.

There are three reasons why the Middle East is as stable as it is now. right?

One was the willingness of the United States and its allies to provide some degree of military security.

Second, oil was expensive, so it was easy to get tons of cheap money out of the ground.

And third, no matter how bad their leaders were, the people were relatively quiet.

They didn't have the ability, and most of them didn't have the will to face it seriously.

Well, I would say that in a G-Zero world, all three of these things would become less and less true, failing states, terrorism, refugees, etc.

Will the entire Middle East collapse?

No, the Kurds will get better, and over time Iraq, Israel and Iran will get better.

But generally speaking, it doesn't look good.

Well what about this guy?

He plays his bad hands very well.

There is no question that he is hitting more than his weight.

But in the long run, I didn't mean to.

But in the long run, if you think Russia is hostile for the US and Europe extending NATO to its borders, and the EU encroaching on it, when we said we weren't going to, wait until China pours hundreds of billions of dollars into every country around Russia that it considers influential.

The Chinese will rule. Russians are picking up breadcrumbs.

In the world of G-Zero, it will be a very tense decade for Putin.

It's not all bad. right?

In fact, Asia looks better.

All of Asia has real leaders and they are very stable politically.

they've been there for a while.

India's Modi, Japan's Liberal Democratic Party is probably on the verge of winning a third term, Abe, and of course China's most powerful leader since Mao Zedong, Xi Jinping, who is consolidating enormous power.

These are the three most important economies in Asia.

Now, Asia has a problem.

You can see sparring going on over the South China Sea.

We know that Kim Jong Un has tested yet another nuclear weapon in the last few days.

But Asian leaders don't feel the need to wave flags or be xenophobic to actually allow geopolitical and cross-border tensions to escalate.

They want to focus on long-term economic stability and growth.

And that is what they are actually doing.

Let's turn to Europe.

Europe looks a little intimidated in this environment.

Much of what is happening in the Middle East has literally washed up on the shores of Europe.

Looking at Brexit, we see populist concerns in every European state.

Let me tell you that in the long run, European expansion will be seen as excessive in a G-Zero world.

If Europe went all the way to Russia and all the way down to the Middle East, and the world was really flatter and more Americanized, it wouldn't matter so much, but in a G-Zero world, the countries closest to Russia and closest to the Middle East actually have different economic capacities, different social stability, different political preferences and institutions than core Europe.

So Europe could really expand under the G7, but under the GZero Europe would be smaller.

Core Europe, centered on Germany, France, etc., will continue to function, function, stabilize, prosper and be integrated.

But its neighbors, countries like Greece and Turkey, don't look so good.

Populism was rampant in Latin America, and the economy was not doing very well.

They have been more against America for decades.

They keep coming back.

We see it in Argentina too.

Cuba's openness shows that.

We will see it in Venezuela when President Maduro falls.

We will see post-impeachment Brazil and finally a new and legitimate president elected there.

The only place I see things going the other way is the unpopularity of Mexican President Peña Nieto.

There, we may actually see it move further away from the United States in the next few years.

In this regard, too, the US election is very important.

(Laughter) Africa, right?

Many are saying it's finally the African decade.

In the world of G-Zero, it's just great times for some African countries, where much urbanization is well-governed, smart people are abundant, women are fully in the workforce and entrepreneurial spirit is burgeoning.

But for most African countries, it will be far more dangerous: extreme climatic conditions, both Islamic and Christian extremism, very poor governance, borders that cannot be defended, and mass forced migrations.

Those countries may disappear from the map.

I mean, we're going to really see extreme discrimination between winners and losers all over Africa.

Finally, return to America.

what do we think about us

Because there are a lot of people who are upset, not here at TEDx, I know, but God, in America, after 15 months of campaigning, we should be upset.

I know that.

But many are outraged, saying, "Washington is broken, we don't trust the system, we hate the media."

Heck, even a globalist like me takes it with a chin.

Look, fellow campers, I think we need to realize that when you're being chased by a bear in a global context, you don't have to pass the bear, you just have to pass your fellow campers.

(Laughter) Now, I just talked about our fellow campers.

right? From that perspective, we look okay.

In that context a lot of people say, "Let's go to the dollar. Let's go to New York real estate."

Let's send our children to college in America. ”

As you know, our neighbors are great. Canada, Mexico and two large bodies of water.

Do you know how much Turkey wants such a neighbor?

They're great neighbors.

Terrorism is a problem in the United States.

God knows we know it here in New York.

But it's a much bigger problem in Europe than in the US.

It's a much bigger problem in the Middle East than it is in Europe.

These are big factors.

We have just taken in 10,000 Syrian refugees, and we are very frustrated about that.

you know why? Because you can't swim here.

right? In other words, the Turks want only 10,000 Syrian refugees.

Jordanian, German, British. right?

That's not the case.

That is the reality of America.

Pretty good, isn't it?

Here is the challenge.

In the world of G-Zero, we must lead by example.

If you don't want to be the world's policeman anymore, you won't be the architect of global trade, you won't be the cheerleader for global values, you won't do things the way you used to, that the 21st century is changing and you know you need to lead by example, then everyone else will say as compellingly as they still do, they're not just fast campers.

Even when the bears aren't chasing you, this is a good place.

We want to emulate them.

This year's election process has proven not to be a good choice for setting an example.

Hillary Clinton says it will be like the 90's.

We can still continue to be the cheerleaders of our values.

We can still be the builders of global trade.

We can still be the sheriffs of the world.

And Donald Trump is taking us back to the '30s.

He says, "Our road or the highway. If you don't like it, put it together." Right?

Neither recognizes the underlying truth of G-Zero. That is, even though the United States is not declining, it is becoming objectively harder for Americans to impose their will on the world order, or even have much influence.

Are we ready to lead by example and truly lead?

What will have to be done to resolve this after November when the next president takes office?

Well, we need a new crisis to respond to.

Depression would be.

Another global financial crisis could trigger this.

No way, 9/11 might do that again.

Or even if there is no crisis, we need to understand that the hollowing out, the inequalities, and the growing challenges in America themselves have enough urgency to force change on leaders, and we have those voices.

Through our mobile phones, we are giving individuals a voice to force change.

Of course there is a third option, but perhaps the most likely option is to do neither. Four years later, you invited me back and I'm going to give this speech again.

thanks so much.

(applause)

Over the next 20 years, half of the human workforce is expected to be replaced by software and robots.

And many business owners welcome it as an opportunity to increase profits.

Machines are more efficient. Humans are complex and difficult to manage.

Well, I want the organization to remain human.

I really want to be beautiful.

Because as machines take over our jobs and do them more efficiently, soon we humans will be left with only the kind of work that has to be done beautifully, not efficiently.

Creating beauty may be the only way to maintain humanity in the second machine age.

Beauty is an elusive concept.

For the writer Stendhal, it was the promise of happiness.

For me it's Lionel Messi's goal.

(Laughter) Please allow me to suggest four, obviously very subjective principles that you can use to build beautiful organizations.

First, do unnecessary things.

[Doing unnecessary things] A few months ago, Hamdi Urukaya, the founder and CEO of yogurt company Chobani, made headlines when he decided to grant shares to all 2,000 employees.

Some called it a PR stunt, while others called it a real return of favor.

But there was another notable point about it.

It was all sudden.

There was absolutely no market or stakeholder pressure, and employees were so shocked to hear the news that they burst into tears.

Action like Urukaya is beautiful because it catches us off guard.

They are completely unnecessary, so they create something from scratch.

I used to work for a company that merged a large IT outsourcing company with a small design company.

We were integrating 9,000 software engineers and 1,000 creative types.

And to integrate these vastly different cultures, we intended to launch a third new brand.

And the new brand color was going to be orange.

And as we were burning through our deployment budget, we decided last minute to cut back on the 10,000 orange balloons we had planned to distribute to all our staff around the world.

In the end it just looked unnecessary and cute.

Little did I know at the time that our decision marked the beginning of the end. The two organizations were never one.

And sure enough, the merger ended in failure.

Now, is it because there were no orange balloons?

No, of course not.

But the spirit of killing orange balloons permeated everything else.

You may not always realize it, but when you cut something you don't need, it cuts everything.

Leading with beauty simply means going beyond what is necessary.

So don't kill the orange balloon.

The second principle is to create intimacy.

[Creating intimacy] Studies show that how we feel about the workplace depends heavily on the relationships we have with our co-workers.

And what is a relationship other than a series of microinteractions?

Every day in our organization there are hundreds of these pieces of information that can make the difference between a good life and a beautiful life.

Marriage researcher John Gottman says that the key to a healthy relationship is small moments of attachment, not grandiose acts or lofty promises.

In other words, intimacy.

In our networked organization, we advertise the strength of weak ties but underestimate the strength of strong ties.

We forget the author Richard Bach once said, "Intimacy, not connection, is the antithesis of loneliness."

So how do we design organizational intimacy?

The humanitarian organization CARE wanted to launch a gender equality campaign in a village in northern India.

But I quickly realized that I needed to have this conversation with my own staff first.

So we invited all 36 team members and their partners to visit one of the Khajuraho temples, known for its famous erotic sculptures.

And there they talked candidly about their personal relationships, their experiences with gender equality with their colleagues and partners.

It was an eye-opener for the participants.

Not only has it enabled them to engage with the communities they serve, it has also broken down invisible barriers and created lasting bonds between them.

In the four years that followed, not a single team member quit.

This is how intimacy is created.

I don't have a mask...

Or a lot of masks.

(Laughter) When food company Danone wanted to translate its new corporate manifesto into its product initiatives, it brought together management and 100 employees from different departments, seniority levels and geographies for a three-day strategy camp.

And during the meeting, everyone was asked to wear costumes such as wigs, crazy hats, feather boas, and giant glasses.

And they left with tangible and ambitious achievements.

And when I asked the woman who designed the experience why it worked, she simply said, "Never underestimate the power of a ridiculous wig."

(Laughter) (Applause) Wigs kill hierarchy, and hierarchy kills intimacy. It's the same for both CEOs and interns.

Wigs allow you to disguise falsehoods and show the truth about yourself.

And it's not easy in our daily work life. Because our relationships with organizations are often like married couples who were estranged, suffered betrayal and disappointment, and are now desperate to be beautiful for each other again.

And for both of us, the first steps to beauty come with great risks.

Risk of becoming ugly.

[Be Ugly] So many organizations these days are passionate about designing beautiful workplaces that look nothing like their vacation resorts, coffee shops, playgrounds, college campuses -- (laughter) On the promise of positive psychology, we talk about play and gamification. And one startup even says they graduated when someone was laid off.

(Laughter.) Such beautiful words, as writer Dorothy Parker once said, are only superficial, but they cut the ugly clean to the bone.

To be real is to be ugly.

It doesn't mean you shouldn't have fun or give in to vulgarity or cynical things, but it does mean that you speak the actual ugly truth.

Like this manufacturer that wanted to transform one of its struggling business units.

We identified, named, and pinned all the performance-blocking issues to a big board. There were hundreds of them.

They put them on a board and moved them all into one room called the "ugly room".

The ugly became visible to all, and it was celebrated.

And that ugly room acted as a combination mirror exhibition room and operating room, where living flesh biopsies were performed to eliminate all bureaucracy.

The ugliest part of our body is the brain.

Literally and neurologically.

Our brains render unfamiliar things ugly...

Contemporary art, atonal music, jazz, or even VR goggles, strange objects, sounds, and people.

But we've all been ugly at one time or another.

We were strange-looking babies, newcomers to the neighborhood, foreigners.

And when we lose our place, we will be ugly again.

Berlin's activist group Center for Political Aesthetics recently made a radical artistic intervention.

With his relatives' permission, he exhumed the bodies of drowned refugees at the European border, transported them to Berlin, and reburied them in the heart of the German capital.

The idea was to allow them to reach their desired destination, even after death.

Such beautification may not be beautiful, but it is much needed.

Because when there is only one meaning, one truth, one answer, and no questions, things tend to get ugly.

Beautiful organizations are always asking questions.

They remain incomplete and this is the fourth and final principle.

[Unfinished] Recently I was in Paris and a friend took me to Nuit Debout. Nuit Debout, short for "All Night", is a voluntary protest movement formed in response to proposed French labor laws.

Hundreds of people gathered at Place de la Republique every night.

Each night they set up a small makeshift village and pondered their vision of the French Republic.

And at the core of this adhocracy was the General Assembly, where everyone could speak using a specially designed sign language.

Like Occupy Wall Street and other protests, the Nuit Debout was born out of a crisis.

It was full of confusion, disputes and contradictions.

But every gathering was a beautiful lesson in raw humanity, whether we agreed with the movement's goals or not.

And how the ideal city, Paris, the city of beauty, is suitable for the stage.

It reminds us that the most beautiful organization, like the big city, is an idea worth fighting for, even if the outcome is uncertain.

they are movements. They are always imperfect and never perfectly organized, thus avoiding mediocrity.

They have something, but they don't know what it is.

They are still full of mysteries. We can't take our eyes off them.

we find them beautiful.

So doing unnecessary things, creating intimacy, being ugly, being imperfect, these are not just beautiful organizational traits, they are inherently human traits.

And these are also the attributes of what we call "home."

And when we are disrupted and confused, the least we can do is make sure that our organization still feels comfortable, and that we use it to create that feeling for others.

Beauty can save the world when we embrace these principles and design to them.

In the face of artificial intelligence and machine learning, we need a new radical humanism.

We must acquire and promote a new aesthetic and emotional education.

Otherwise, we may end up feeling like aliens in organizations and societies full of clever machines that have no appreciation for the unnecessary, the intimate, the imperfect, or even the ugly.

thank you.

(applause)

Hi.

I want to talk about understanding, and the nature of understanding, and what the nature of understanding is. Because understanding, dear ones, is what we are striving for.

We want to understand things.

My argument is that understanding requires the ability to shift perspective.

Without it, there is no comprehension.

That's my point.

And I want to concentrate on mathematics.

Many of us think of mathematics as addition, subtraction, multiplication, division, fractions, percentages, geometry, algebra and everything else.

But I also want to talk about the essence of mathematics.

And my point is that math has to do with patterns.

I can see a beautiful pattern behind me, but this pattern actually shows up just by drawing circles in a very specific way.

Here's the math definition I use every day: First and foremost is finding patterns.

And by “pattern,” I mean the connections, structures, regularities, and rules that govern what we see.

The next step, I think, is to express these patterns in language.

If we don't have a language we make it up, but in mathematics this is essential.

It's also about making assumptions, playing with those assumptions, and just seeing what happens.

We plan to do that soon.

And finally, do cool things.

Mathematics allows us to do so many things.

Now let's look at these patterns.

If you want to tie a tie knot, there are patterns.

Tie knots have names.

You can also do knot calculations.

This is left out, right in, center out and tie.

This is left-in, right-out, left-in, center-out, and tie.

This is the language we made for tie knot patterns, and half windsor is all about it.

Since shoelaces have patterns, it's a college-level math book on how to tie shoelaces.

You can do it in various ways.

you can analyze it.

We can make a language for that.

And expressions are everywhere in mathematics.

This is the Leibniz notation of 1675.

He invented a language to describe patterns in nature.

If you throw something in the air, it will fall.

why?

I'm not sure, but you can put this into a pattern in math.

This is also a pattern.

This is also an invented language.

Can you guess what for?

This is actually a musical notation system for dance and tap dance.

It allows him to do cool and new things as a choreographer. Because he has expressed it.

I want you to think about how wonderful it is to actually express something.

The word "mathematics" is written here.

But it's really just a point, right?

So how exactly can these dots represent words?

Well, yes.

These represent the word "mathematics," and these symbols also represent that word and this word we can hear.

Something like this.

(beep) Somehow these sounds represent words and concepts.

How does this happen?

Something amazing is happening when it comes to representing things.

So let's talk about the magic that happens when we actually express something.

Only lines with different widths are shown here.

These represent specific book numbers.

And I really recommend this book, it's a great book.

(Laughter) Trust me.

OK, let's do an experiment. Let's play around with some straight lines.

This is a straight line.

Let's make another one.

That is, each time it moves, it moves one down, one to the side, and draws a new straight line.

Repeat this over and over to look for patterns.

So this pattern was born, and it's a pretty good pattern.

It looks like a curve, right?

Just draw a simple straight line.

Now we can change our perspective a little. Can be rotated.

Look at the curve

what does it look like?

Are you part of a circle?

Actually, I don't belong to any circles.

Therefore, we need to keep investigating and look for real patterns.

How about copying it and making art?

Hmm, no.

You should probably extend the line like this and look for patterns there.

Let's make more lines.

we do this

Now let's zoom out and change the perspective again.

Then you discover that what was originally just a straight line is actually a curved line called a parabola.

It's a simple equation and a beautiful pattern.

This is the work we do.

We find patterns and express them.

I think this is a good definition for everyday use.

But today I want to dig a little deeper and consider what the nature of this is.

What makes it possible?

One thing goes a little deeper and it has to do with your ability to change your perspective.

And I would argue that if you shift your perspective and take a different perspective, you can learn something new about what you see, see, and hear.

And I think this is a really important thing that we do all the time.

So let's look at this simple equation, x + x = 2 • x.

This is true because it's a very nice pattern, 5 + 5 = 2 • 5, etc.

We've seen this many times, so we put it this way.

But think about it. This is an equation.

Something being equal to something else is two different points of view.

One way of looking at it is that it's a total.

That's what you plus together.

On the one hand it is multiplication, these are two different points of view.

And I would go so far as to say that all equations are like this, and that all mathematical equations where the equal sign is used are really metaphors.

This is the similarity between the two.

You're just looking at something and taking two different perspectives and expressing it in language.

Look at this equation.

This is one of the most beautiful equations.

It simply says that two things are both -1.

This one on the left is -1 and the other one is -1.

I think it's one of the essential parts of mathematics. you have different points of view.

Let's play a little.

Let's take the numbers.

We know four thirds. We know what four thirds is.

This is 1.333, but we must have these three points. Otherwise it wouldn't be exactly four thirds.

But this is only in decimal.

As you know, the numbering system uses 10 digits.

If you change this and use only two digits, it is called binary.

It is written like this.

So now we are talking about numbers.

That number is four thirds.

You can write it this way, or you can change the base, change the number of digits, or write it another way.

So they all represent the same number.

It can also be simply written as 1.3 or 1.6.

It all depends on the number of digits.

Or you might simplify and write it like this:

I like this because it's 4 divided by 3.

And this number represents the relationship between two numbers.

One has 4 and the other has 3.

And we can visualize this in different ways.

What I'm doing now is looking at that number from different perspectives.

I'm playing

I'm playing around with how I look at things, and I'm doing it very intentionally.

I can get the grid.

With 4 across and 3 up, this line is always equal to 5.

It should be like this. This looks beautiful.

And I'm sure you've seen this 4x3 rectangle many times.

This is your average computer screen.

800 x 600 or 1,600 x 1,200 is a TV or computer screen.

These are all great representations, but I'd like to go a little further and experiment with this number further.

Here you will see two circles. I will rotate it like this.

Notice the top left.

You can tell by looking at this.

It's actually just four-thirds as fast.

That means 4 laps and another 3 laps.

Then create two lines and draw this point where the lines meet.

This dot dances.

(Laughter) And this dot comes from that number.

right? Now I have to track it down.

Let's track it down and see what happens.

This is what math is all about.

It's a matter of seeing what happens.

And this comes out of four thirds.

I want to say that this is the image of 4/3.

So much better -- (Cheers) Thank you!

(Applause.) This is nothing new.

It's been known for a long time -- (laughter) but it's four thirds.

Let's do another experiment.

Now let's hear the sound. It's this sound: (beep) It's a perfect A, 440Hz.

Let's double that.

I hear this sound. (beep) When you play together, it feels like this.

This is an octave, right?

This game can. You can play a sound and play the same A.

(beep) This is a so-called perfect fifth.

(Beep) Sounds very nice.

Let's multiply this sound by 4/3. (beeps) What will happen?

I know this sound. (beep) This is a perfect fourth.

If the first one is A, then this is D.

Together it sounds like this. (beep) This is a 4/3 sound.

What I am doing now is changing my perspective.

I'm just looking at the numbers from another perspective.

You can do it with rhythm, right?

You can take a rhythm within a period of time and play three beats (drum beats) at once, and you can play different sounds four times in the same space.

(clacking sound) It sounds boring, but please listen to it with me.

(Sound of drums and clatter) (laughs) Hey! So.

(laughs) I can make a little hi-hat.

(Sound of drums and cymbals) Can you hear me?

This is the sound of 4/3.

Again, this is as a rhythm.

(Drumbeat and cowbell) And I can go on and play the game with this number.

Four thirds is a really nice number. I love four thirds!

(Laughter) Really, this is an underestimated number.

So if you take a sphere and look at its volume, it's actually four-thirds the size of a particular cylinder.

So 4/3 is inside the sphere. is the volume of the sphere.

Okay, so why am I doing this?

Now I want to talk about what it means to understand something and what it means to understand something.

That's my purpose here.

And my point is that if you have the ability to see things from different perspectives, you can understand anything.

Let's take a look at this letter. It's a beautiful R, isn't it?

How do you know?

As a matter of fact, you've seen a lot of R and found generalizations, abstractions and patterns in all this.

So we know this is R.

So what I want to say here is say something about how understanding and changing perspective are related.

And I am a teacher and a lecturer and I can actually use this to teach something. Because when you give another person another story, metaphor, or analogy, you can understand it if you tell the story from another perspective.

What makes my understanding possible is that you have to generalize everything you see and hear. It will be easier for you if I give you another perspective.

Let's try our simple example again.

This is 4 and 3. This is 4 triangles.

So this is also in a way four thirds.

Join us.

Now let's play a game. Fold it into a three-dimensional structure.

i love this.

This is a square pyramid.

Let's take two of them and combine them.

This is the so-called octahedron.

It is one of the five Platonic solids.

You can now literally change your point of view as you can rotate your point of view around all axes and see from different perspectives.

And if you change the axis, you can see it from a different perspective, but the same thing looks a little different.

I can do it one more time.

Every time you do this, something different will appear, so you can actually learn more about that object by changing your perspective.

You can use this as a tool to generate understanding.

Combine these two like this and see what happens.

And it looks a bit like an octahedron.

Look at it when you turn it like this.

what happens?

Well, if you take two of these, combine them, rotate them, and you've got another octahedron, a beautiful structure.

If you lay it flat on the floor, it becomes an octahedron.

This is an octahedral graph structure.

And I can continue with this.

There are actually three great circles associated with the octahedron, as you can draw and rotate the octahedron around the three great circles.

If you use a bicycle pump to inflate it, you'll find that it also looks a bit like a regular octahedron.

do you know what i'm doing here?

I change my perspective each time.

So let's take a step back, really a metaphor, take a step back and see what we're doing.

Playing with metaphors.

Playing with perspectives and analogies.

One story is told in many different ways.

i am telling a story.

I am making a story. I am making some stories.

And I think all of this makes understanding possible.

Actually, I think this is the essence of understanding something.

I believe this wholeheartedly.

In other words, changing perspective is absolutely fundamental to human beings.

Let's play with the earth

Let's zoom in on the ocean and see the ocean.

This can do anything.

You can take pictures of the sea and see it up close.

You can see the waves.

we can go to the beach

You can see the sea from another perspective.

Every time we do this, we learn a little bit more about the ocean.

If you go to the beach, you can smell it somehow, right?

I hear the sound of waves.

We can feel the salt on our tongue.

So these are all different points of view.

And this is the best.

You can enter the water.

You can see the water from inside.

And what do you know?

This is absolutely essential in mathematics and computer science.

If you can see the structure from the inside, you can really learn something about it.

It is, in a way, the essence of something.

Therefore, we use our imagination when doing this, and when embarking on our journey to the sea.

And I think this is an even deeper level, a requirement to actually change your perspective.

You can play a little game.

I can imagine myself sitting there.

You are here and you can imagine sitting here.

You can see yourself from outside.

It's really strange.

You are changing your perspective.

You are imaginatively looking at yourself from the outside.

It takes imagination.

Mathematics and computer science are the most imaginative art forms ever.

Changing perspective should sound a little familiar because it's something we do every day.

And it's called empathy.

Seeing the world from your perspective, I empathize with you.

I empathize if I really, really understand what the world looks like from your perspective.

It takes imagination.

And that's how we get understanding.

This is true of mathematics in general, computer science in general, and empathy is very closely related to these sciences.

So my conclusion is: Deep understanding of something requires the ability to shift perspectives.

So my advice to you is to change your perspective.

You can study mathematics.

A great way to train your brain.

Changing your perspective makes your thinking more flexible.

It can make you open up to new things and understand things.

To use yet another metaphor, have a mind like water.

that's nice.

thank you.

(applause)

I feel incredibly lucky to be from a country that is generally considered the best place in the world for women.

In 1975, when I was seven years old, Icelandic women went on strike.

They didn't work that day, whether they were doing professional work or doing household chores.

They marched into the center of Reykjavík, with 90 percent of women participating, in peaceful solidarity demanding equality.

Nothing went wrong that day in Iceland. Because if women don't work, nothing will work.

(Applause.) Five years later, Icelanders have the courage to become the first country in the world to democratically elect a woman as president.

I will never forget the day President Vigdis, who we know by his first name, walked out onto his balcony with his daughter by his side as a victorious single mother.

(Applause.) This woman was a great role model for me and for everyone growing up at the time, including the boys.

She often tells the story that after serving several terms as president, a boy approached her and asked, "Can a boy really be president?"

(Laughter) Role models are really important, but even such strong role models that I am so grateful for, when I was invited to run for president, my first reaction was, "Who am I to run for president?"

Who am I to be president? ”

Women were found to be less likely to consider running than men.

So a 2011 US survey found that 62% of men were considering running for office, compared with 45% of women.

This is a difference of 16 percentage points, the same difference that existed ten years ago.

This is a real shame because I am convinced that the world really needs women leaders, and more principled leadership.

So my decision to run ultimately came down to the fact that even though I had no political experience, I felt compelled to do my part. I tried to step up and participate in creating a meaningful and sustainable world for children, a world where boys and girls can truly be themselves.

And it was my life's journey as well.

It was amazing.

The journey began with potentially 20 candidates.

In the end, 9 candidates passed the qualifying round, and in the end, the race was decided by 3 men and 4 of me.

(Applause) But the drama doesn't stop there.

You may think America has drama, but I can – (laughter) I can assure you that Iceland had its own drama.

That's why the incumbent president, who has been in office for 20 years, initially announced he would not run, which is probably what has created so many candidates considering running.

Then he changed his mind when the prime minister resigned following the infamous Panama Papers involving him and his family.

And with popular protests in Iceland, the incumbent president thought he needed a leader he could trust.

A few days later, the Panama Papers also revealed his wife's relationship with the family's company, and he again declined to run.

Before doing so, he said he was doing so because he felt there were now two qualified men to run for election.

So on May 9th, 45 days before Election Day, things weren't going so well for me.

I didn't even put the graph in the newspaper.

I got 1% of the vote in the polls, which was still the highest percentage of any woman who announced a candidacy.

So it's fair to say I had to struggle a lot to get to my table and access the TV. That's because the TV network decided to only include supporters with 2.5 percent or more in the poll for the first TV debate.

On the afternoon of the first televised debate, I learned that I was going with the three of them, and on the day of the first televised debate, I learned live that I had just 2.5 percent of the vote.

(Applause) So here's the challenge.

The biggest challenges I faced and had to overcome on this journey were with media, muscle and money.

Let's start with the media.

Some people say that gender doesn't matter when it comes to media and politics.

I can't say I agree.

Getting access to media and airtime proved even more difficult for me.

In fact, in the months leading up to the election, the leading candidate made 87 broadcast media appearances, while I made 31.

I'm not saying the media does this consciously.

I believe this has mostly to do with unconscious bias. Because in the media, just like everywhere else, there are biases, both conscious and unconscious, and if we want to change them, we need to have the courage to talk about them.

When I finally got access to TV, the first question I got was, "Are you going to quit?"

It was hard.

But of course, the polls say between 1 percent and 2.5 percent, so that might make sense.

But the media really matters, and having seen and experienced the rise in the polls every time I've been on TV, I know firsthand how important this is and why we have to talk about it.

Of the four final candidates, I was the only one who did not get a full interview.

At times I was excluded from all other candidates' questions and coverage of the election.

So I have faced this issue but I say this to compliment the Icelandic media.

There were very few comments about my hair and pantsuit.

(Applause.) Kudos to them.

But I have another very important experience.

I ran as an independent candidate without the support of any political party or faction.

Our lack of experience and lack of access to resources probably took a toll on our campaign, but it also allowed us to innovate and do politics differently.

We have run a positive campaign and perhaps changed the mood of the election for others with it.

The lack of TV time may have been due to a desire to honor the other candidates.

We ran our own media when access to it proved to be very difficult.

I conducted a live Facebook session where I answered every question from the voters and responded on the spot.

And because I believe transparency is important in building trust, I have published all the questions and all the answers I have received on open Facebook.

And when I found it difficult to reach younger voters, I turned to Snapchat.

We had young people teach us how to do it, and we used all of Snapchat's filters for the final part of the campaign.

In fact, I was so bad at humor and humility that I had to use a lot of it.

However, doing so has increased its following among young people.

Therefore, it is also possible to run different kinds of campaigns.

Unfortunately, you can't talk about politics without mentioning money.

It's a shame it's come to that, but it's true, we had less money than the other candidates.

Perhaps this was partly due to the fact that I had difficulty seeking financial assistance.

And perhaps there was also the ambition to do more with less.

Some would say I'm very feminine.

But even though it was 1/3 media, 1/3 coffers, just an entrepreneurial team, a great team, we were able to surprise everyone on election night when the first numbers came out.

As you can see from the photos, I was also surprised.

(Laughter) In the first numbers, I'm on par with the front-runners.

(cheers) Well, too soon. Because I didn't get enough results. But I came in second, a far cry from the 1 percent share of the vote, with nearly a third of the votes cast, an unprecedented margin, 10 percentage points better than the last poll.

Some people call me a true election winner because of this, and many have encouraged me to run again.

But what makes me really proud is that I got a proportionally high percentage of young people's support, and many encouraged their daughters to run for office in 2040.

(Applause.) She was 13 and had never been on television before.

And on election day, I watched her on television repeatedly, she was smart, confident, loyal, and supportive of her mother.

This was probably the highlight of my campaign.

(Applause.) But there was one more thing.

These are kindergarten girls who found my poster at the bus stop while walking and felt the need to kiss it.

Audience: Oh!

This photo alone was enough of a win for me.

What we see can become us.

So spoil the fear and the challenge.

(Applause.) It's important for women to run for office, and the time has come for women to run for office, whether it's for CEO or president.

I was able to give an impression to your "New Yorker" as well.

You've earned a new title, "Sincere Living Emoji."

(Cheers) This is probably my proudest title ever. The reason is that too often women are penalized for using what I call emotional capital, but we know from experience that they become very good people when they do it.

(Applause.) And we need more of that.

We celebrated like we won election night. Because that was how we felt.

So you don't necessarily have to go to that office.

You just have to work towards it, and if you, your family, your friends, everyone who works with you do it well, you will grow beyond what you have ever been through.

We had a great time and I learned a lot on this trip, probably more lessons than I can share here in today's time.

But don't worry, it was a lot of work.

During those months, I lost a good deal of sleep.

It took resilience and perseverance to not quit, but One Percent Day taught me something I knew all along. It's that you can only be a good person when you really listen to yourself and work with it.

As my good sister sometimes says, you may fool your intuition, but your intuition will never fool you.

Also, I think this is very important. As we all know, it's a team that accompanies any journey.

It's about having people around you who share your values ​​and vision, but who are different in every other way.

That's the formula for success for me, and I'm blessed with an amazing husband, an amazing family, (applause) and amazing friends who are here today. And we united as entrepreneurs on the political stage to accomplish something that everyone said was impossible.

In fact, a PR guru told me that getting 7% was enough before I even made a decision.

I appreciated his point of view because it was probably correct and based on valuable experience.

But on One Percent Day, I decided to prove him wrong here.

It is very important to mention this. Because I lost a lot of sleep, but I worked hard. And so did the people I was with.

You won't get far if you forget to take care of yourself.

And while I think it's so important to surround yourself with people and habits that nourish you, it's equally important, and perhaps even more important, to have the courage to get rid of people and habits that sap your energy, including great bloggers and commentators.

In doing this, I received a lot of support from others. I decided to go high, even when others were depressed. That was part of how I kept my energy up during all this.

And when I lost energy for a moment, I did sometimes, and it wasn't easy. I went back to why I decided to run and how I decided to run my race.

I called this the 4G campaign. G stands for Icelandic words.

And the first one is called "Gagn".

I ran to do good and serve. And I wanted servant leadership to be at the heart of how I and everyone else in the campaign works.

The second is "Gleði", which means joy.

I decided to enjoy my trip.

Whether we reached our destination or not, there was much to be gained from the journey.

And I did my best to inspire others to do the same.

The third is “transparency”.

Any questions are welcome.

I had no secrets and was open about everything on Facebook and on my website.

Because if you elect a president, I think you have the right to answer your question.

Last but not least, in this room we operated on the principle of girl power.

(Cheers) I'm incredibly happy to have had the courage to run, risk failure, and be successful on so many levels.

I wouldn't say it was easy, but I would say it was worth it and I think the whole team would agree.

thank you.

(Applause.) Thank you.

thank you.

(Applause) Pat Mitchell: I'm not letting you go yet.

Halla Tomasdottir: Great audience.

Prime Minister: I have to say that probably everyone here is ready to move to Iceland and vote for you.

Of course, you won't be able to vote there, but one of the things Iceland has, and always has, is inspiration.

I mean, I'm old enough to remember 1975, when all the Icelandic women left the country. It was a huge factor in launching the women's movement.

I also referred to it earlier. I want to bring this picture up again and remind you what it was like when the country was at a standstill.

And in case you don't know because the US media isn't reporting it, the Icelandic women came out again on Monday. right?

HT: Yes, it was. Prime Minister: Could you tell us about that?

HT: Yes, 41 years after the first strike, we may be the best place in the world for women, but our work is not done yet.

So at 2:38 pm on Monday, the Icelandic women finished their work. Because that day received that day's pay.

(Applause.) What's really great about this is that it's time to close the pay gap, so more young women and men are joining us than ever before.

Prime Minister: So I'm not going to ask Mr. Hara to do the next thing right now, but if you decide to do the same thing again, you'll have a very large volunteer army.

Hara-chan, thank you.

HT: Thank you everyone.

(applause)

Last year, three members of my family were brutally murdered in hate crimes.

Needless to say, it's really hard for me to be here today, but my brother Dea, his wife Yusol, and her sister Razan don't give me much choice.

I hope that by the end of this talk, you will make a choice and join me in fighting hate.

It is December 27, 2014, the morning of my brother's wedding.

He asked me to come comb his hair in preparation for the wedding photo shoot.

The 23-year-old, 6-foot-3 basketball player, especially Stephen Curry, is a frenzy -- (Laughter) an American kid in dentistry who is ready to take on the world.

When Dare and Yusol danced for the first time, there was love in his eyes and she felt the joy in responding, and the emotions started to overwhelm me.

I moved to the back of the hall and started crying.

And the moment the song finished playing, he came straight up to me, buried me in his arms, and rocked me back and forth.

Even in those moments when everything was distracting him, he was with me.

He scooped my face and said, "Suzanne, it's because of you that I'm here.

Thanks for everything.

I love you. "

About a month later I was back at my home in North Carolina for a short visit and last night I rushed upstairs to Dare's room wanting to see how he was feeling as a newlywed man.

He smiled like a boy and said, "I'm so happy. I love her. She's a wonderful girl."

And she is.

At just 21, she had recently been accepted into the UNC School of Dentistry.

She shared his love of basketball and at her urging, they began their honeymoon by attending their favorite team in the NBA, the LA Lakers.

So check out that form.

(laughter) I will never forget that moment sitting there with him. how free and happy he was

My younger brother, who was crazy about basketball, was transformed into a fine young man.

He topped his dental class and joined Yusol and Razan in local and international community service projects for the homeless and refugees, including a dental relief trip he was planning for Syrian refugees in Turkey.

At just 19, Razan is an architectural engineering student who has used her creativity to serve those around her, doing projects such as creating care packages for the local homeless.

that was them.

Standing there that night, I took a deep breath, looked at Dare, and said, "I've never been more proud of you than at this moment."

He pulled me into his tall body and hugged me goodnight. And I left the next morning without waking him up to go back to San Francisco.

This is the last time I hug him.

Ten days later, while on duty at San Francisco General Hospital, I received a flood of vague text messages expressing condolences.

Confused, I called my father, who calmly said, "There was a shooting in Dare's neighborhood in Chapel Hill.

We are in lockdown. That's all we know. ”

I hung up the phone and immediately googled 'taken at Chapel Hill'.

You get one hit.

Quote: "Three people were shot in the back of the head and pronounced dead at the scene."

Something inside me just knows

I jumped out of my chair and passed out on the rough floor of the hospital, crying.

I took my first red-eyed person out of San Francisco and was numb and disoriented.

I entered my childhood home and passed out in my parents' arms, sobbing.

Then I ran to Dare's room just looking for him, as I had done so many times before, and found a void that would never be filled.

An investigation and autopsy report eventually revealed a chain of events.

Dia had just gotten off the bus from class and Razan was already at home with Yusol visiting for dinner.

As they started eating, they heard a knock on the door.

When Mr. Dare opened it, a neighbor started firing several shots at Mr. Dare.

According to the 911 call, they heard the screams of the girls.

The man turned to the kitchen and shot Yusol in the hip, immobilizing her.

He then approached her from behind and forced the barrel of the gun to her head, lacerating her midbrain with a single bullet.

He then turned to Razan, who was screaming for her life, and fired a single bullet in the back of the head, killing her execution-style.

On his way out, he took one final bullet to the mouth, for a total of eight bullets. Two were in the head, two in the chest, and the rest in the limbs.

Dea, Yusol, and Razan were executed where they should have been safe: at home.

This man had been harassing them for months, knocking on their door several times and brandishing a gun.

His Facebook was flooded with anti-religious posts.

Yusol felt particularly threatened by him.

When she moved in, he told Yusol and his mother that he didn't like the way they looked.

In response, Yusol's mother told her to be kind to her neighbors and that as she got to know them, she would see them for what they were.

We are all so paralyzed by hatred that we could never have imagined it turning into deadly violence.

The man who killed my brother turned himself in to police shortly after the murder, saying he had executed three children in a parking lot dispute.

Police issued a premature official statement that morning, repeating his allegations without bothering to question or investigate further.

Turns out there was no parking dispute.

There was no discussion.

No violations.

But the damage was already done.

In the 24-hour media cycle, the term “parking dispute” had already become a go-to soundbite.

I sit on my brother's bed and remember his words. The words he gave me so generously and so lovingly: "Because of you I am."

That's what it takes to speak out through my horrifying grief.

I cannot allow my family's deaths to be played down to the point where they barely make it into the local news.

They were killed by their neighbors because of their faith, because of the cloth they wore on their heads, because they were clearly Muslim.

Part of the anger I felt at the time was what would you call it if the roles were reversed and someone who was Arab, Muslim, or appeared to be Muslim killed three white American college students in an execution-style manner in his home.

It's a terrorist attack.

When white men commit violent acts in the United States, they are loners, mentally ill, and driven to fight for parking.

I know I have to get my family's voices heard, but the only thing I know how to do is send a Facebook message to everyone in the media.

A few hours later, in the middle of a chaotic house overflowing with friends and family, my neighbor Neil came in, sat next to my parents, and asked, "What can I do?"

With more than 20 years of experience in journalism, Neil makes it clear that he's not there as a journalist, but as a neighbor who wants to help.

I asked him what he thought we should do in view of the influx of interview requests from the local media.

He suggested holding a press conference at the local community center.

He still has no words to thank him.

"Tell me when, and I'll have all the news channels on board," he said.

In a moment of devastation, He did for us what we could not do for ourselves.

I issued a press statement while wearing last night's scrubs.

And less than 24 hours after the murder, I was interviewed by Anderson Cooper on CNN.

The next day, major newspapers such as the New York Times and the Chicago Tribune published stories about Dare, Yusol and Razan that allowed us to take back the story and call attention to the mainstreaming of anti-Islamic hatred.

These days, Islamophobia feels like a socially acceptable form of prejudice.

We just have to put up with it and laugh.

The nasty stares, the palpable fear when boarding an airplane, the 99 percent chance of indiscriminate disrespect at the airport.

That's not all.

There are politicians who have political and financial interests behind us.

Here in the United States, we have presidential candidates like Donald Trump casually calling for American Muslims to register and barring Muslim immigrants and refugees from entering the country.

It is no coincidence that hate crimes rise in tandem with election cycles.

Just months ago, Lebanese-American Christian Khalid Jabara was murdered in Oklahoma by his neighbor, a man who called him a "filthy Arab."

The man had previously been sentenced to just eight months in prison after trying to run over Khalid's mother with his car.

You may not have heard of Mr. Khalid because he didn't make the national news.

All we can do is at least call it a hate crime.

All we can do is talk about it. Because violence and hatred do not happen in isolation.

Shortly after returning to work, when I was a senior in hospital rounds, one of my patients stared at my colleague, gestured around his face, and said "San Bernardino," referring to the recent terrorist attacks.

Here I am, having just lost three members of my family to Islamophobia, and staying silent despite being vocal in my program about how to deal with such microaggressions.

I was disappointed.

Humiliating.

A few days later, when I visited the same patient, she looked at me and said: "Your people are killing people in Los Angeles."

I look around in anticipation.

Again, silence.

I realized again that I must speak up for myself.

I sit on her bed and gently ask, "Have I ever done anything but treating you with respect and kindness?"

Have I done anything but compassionate care for you? ”

She looked down, realized she was wrong, apologized in front of the whole team, and said, "You should know better. I'm Mexican-American."

I am treated like this all the time. ”

Many of us experience microaggressions on a daily basis.

Regardless of your race, gender, sexuality, or religious beliefs, you've probably experienced it too.

We've all been in situations where we've witnessed something wrong and couldn't speak up.

Perhaps we weren't equipped with the tools to respond to the moment.

Maybe we weren't even aware of our own implicit biases.

We all agree that prejudice is unacceptable, but we keep quiet because it makes us uncomfortable.

But stepping directly into that uncomfortable state also means you're stepping into the allied zone.

There may be over 3 million Muslims in America.

That's still only 1 percent of the total population.

Martin Luther King once said, "After all, we will remember the silence of our friends, not the words of our enemies."

So why is your alliance with your neighbor Neil so deep?

some things.

He was there as a caring neighbor, but brought in specialized expertise and resources when needed.

Others did the same.

Larisia Hawkins has taken her position as the first African-American tenured professor at Wheaton College to wear the hijab in solidarity with Muslim women who face discrimination every day.

As a result, she lost her job.

Within a month, she joined the faculty at the University of Virginia, currently researching pluralism, race, faith, and culture.

Reddit co-founder Alexis Ohanian has demonstrated that not all active alliances need be so serious.

He stood up to support a 15-year-old Muslim girl's mission to introduce hijab emoji.

(Laughter) This is a simple act, but it has a profound subconscious impact on the normalization and humanization of Muslims by including communities as part of 'us' rather than 'others'.

The editor-in-chief of Women's Running magazine has made the first-ever hijabi on the cover of an American fitness magazine.

These are all very different examples of people using academic, technology and media platforms and resources to actively express their affiliation.

What resources and expertise do you offer?

When you witness hateful prejudice, do you step into your displeasure and speak up?

Will you be Neil?

Many neighbors appear in this story.

And in each of your communities you have Muslim neighbors, co-workers, or friends whose children play with them at school.

Please reach out to them.

Tell them that you are in solidarity with them.

It may feel very small, but I promise it will make a difference.

Dea, Yusol and Razan cannot be brought back.

But when we collectively raise our voices, it's time to stop the hate.

thank you.

(applause)

I design engineering projects for middle school and high school students, and I often use the most unexpected materials.

My inspiration comes from problems in everyday life.

For example, one time I needed a costume to go to a comic convention, and I didn't want to spend a lot of money, so I made my own.

Comes with a luminous crown and skirt.

(Laughter) Another time, I was shocked when my favorite mobile game, Flappy Bird, was removed from the app store.

(Laughter) So I was faced with the dilemma of either never updating my phone or never playing Flappy Bird again.

(Laughter) I wasn't happy with either option, so I did the only thing that made sense to me.

I created a physical version of Flappy Bird that can never be removed from the App Store.

(laughter) (music) (beep) (music) (laughter) So some of my friends were pretty into this game too, so I invited them to play too.

(Video) Friend: Oh!

(laughter) (video) Friend: What the hell?

(Laughter.) And they told me it was just as infuriating as the original game.

(Laughter) So I uploaded a demo of this project online and to my surprise it went viral.

It has been viewed more than 2 million times in just a few days.

(Laughter) And even more interesting are people's comments.

There were many people who wanted to try making it themselves and asked how to make it.

Thus, my idea that we can teach people about engineering through creative projects is confirmed.

With the money we got from the viral video, we were able to get every student in the classroom to create their own game in the box.

It was quite challenging, but they learned many new concepts in engineering and programming.

And they were all equally eager to learn so they could beat the game.

(Laughter) So, before I started Flappy Bird Box, I had the idea of ​​using a creative engineering project to teach students.

When I was teaching middle school, I asked my students to build robots from standard tech kits.

And I noticed that many of them seemed bored.

Then some people took out scraps of paper and started decorating the robot.

And even more participants became interested in this project.

So I started looking for more creative ways to introduce my students to technology.

What I have found is that most tech kits available at schools look a little scary.

They are all made of plastic parts and cannot be customized.

On top of that, they are all very expensive, costing hundreds of dollars per kit.

So for most classroom budgets, this is by no means an affordable amount.

I couldn't find anything, so I decided to make something myself.

I started with paper and cloth.

After all, we have been playing with them since childhood and they are very cheap and can be found anywhere in the house.

He then prototyped a project that allowed students to create glowing creatures using fabric and googly eyes.

They were all helping each other in the classroom, laughing and discussing projects.

And most importantly, they were able to incorporate their own creativity into the project.

Due to the success of this project, I continued to create more engineering projects to challenge my students.

And I started taking these workshops out of school and into the community.

And then something really interesting happened.

We have noticed that many people from very diverse backgrounds are starting to come to our workshops.

Specifically, there were far more women and minorities than I expected, something you don't usually see in a traditional engineering workshop.

Now let's take a look at the 2016 Big Tech Employee Report.

Women make up just 19% of the tech workforce.

And the underrepresented minority is only 4 percent.

If you've stepped into a high school robotics club or college engineering class, this statistic may look familiar.

Various issues currently exist that contribute to the lack of diversity in the technology sector.

Perhaps one solution might be to introduce students to technology through creative projects.

I'm not saying this is the cure-all, but the way technology is portrayed and taught in schools can introduce technology to people who aren't naturally interested in it.

So how can we change the way we perceive technology?

Most students find it boring and uncomfortable, so I've always designed my projects according to three principles.

The first is the low floor, which makes this project easy to undertake.

See this tutorial.

The first project we teach our students is to make a circuit on paper.

As you can see, it doesn't take long to learn and is very easy for beginners.

Lowering the floor also means removing financial barriers to project completion.

So with paper, copper tape, light bulbs and batteries, people can complete this project for less than a dollar.

So the second principle is to have high ceilings.

This means that there is a lot of room for growth and students are constantly being challenged.

At first, it might just be a glowing creature, but you can add sensors and microcontrollers and start programming the creature to interact with its environment.

(Laughter) And the third and final principle is customization.

This means we can make this project relevant to everyone.

That's the beauty of using everyday materials. It's very easy to customize using paper and cloth.

So even if you don't like Flappy Bird, you can create your own game.

(Video) Student: So our game is about Justin Bieber. He's speeding and the goal is to keep him from being caught by the LAPD -- (laughter) (video) Student: Yeah, but he's changing -- we're part of his crew.

(laughs) Thank you.

(applause)

Carlos, a Vietnam Veteran Marine, volunteered on three tours, all of which were shot.

In 1971, he retired medically after having enough debris in his body to trigger a metal detector.

Over the next 42 years, he suffered from nightmares, public anxiety, isolation and depression.

He self-medicated with alcohol.

He has been married and divorced three times.

Carlos suffered from post-traumatic stress disorder.

Now, I have become a psychologist to help alleviate human suffering, but for the past decade my goal has been the suffering caused by PTSD experienced by veterans like Carlos.

Until recently, the science of PTSD did not exist.

So we didn't know what to do.

We drugged some veterans heavily.

Some were hospitalized and had general group therapy, but still others just said, "Go home and try to forget your experience."

More recently, I've tried things like therapy dogs and wilderness retreats, which may relieve stress temporarily, but don't really help with PTSD symptoms in the long run.

But things have changed.

And what I came here for is that we can now eradicate PTSD, not just manage the symptoms of vast numbers of veterans.

Because new scientific research has been able to objectively and repeatedly show which treatments actually eliminate symptoms and which do not.

It turns out that the best PTSD treatments today use many of the same training principles that the military uses to prepare its trainees for war.

Well, making war is what we are good at.

We humans have been at war since before we were fully human.

Since then, we have moved from using stone and sinew to developing the most sophisticated and devastating weapon systems imaginable.

And we employ state-of-the-art training methods to enable our warriors to wield these weapons.

We are good at making war.

And we are good at training warriors to fight.

But given the experience of modern veterans, we begin to see that they are not so well prepared for their return.

why is that?

Well, our ancestors lived in conflict, fighting where they lived.

Therefore, until very recently in our evolutionary history, there was little need to learn how to return from war. Because I never really did.

But thankfully today, most of humanity lives in far more peaceful societies, and when conflict strikes, we, especially in the United States, have the technology to have our warriors highly trained, sent to fight anywhere on the planet, and then flown back to peacetime suburbs when the battle is over.

But just imagine what this feels like.

I spoke with veterans who told me that one day in Afghanistan, they were involved in a violent shootout, witnessed carnage and death, and only three days later found themselves carrying an ice box to a children's soccer game.

"Mindfuck" is the most common term.

(Laughter) That's the most common term I've heard to describe that experience.

And that's exactly what it is.

For our warriors have spent countless hours training for war, and we have recently learned that many of them need training on how to return to civilian life.

Now, like any training, the best PTSD treatment requires repetition.

In the military, we don't just hand the trainee a Mark-19 automatic grenade launcher and say, "Here's the trigger, there's ammunition, good luck."

No, we train them over and over again on the range and in specific situations so that the act of lifting a weapon and engaging a target is deeply embedded in their muscle memory and can be done without thinking in the most stressful situations imaginable.

Now, the same is true for training-based treatments.

The first of these treatments is cognitive therapy, which is a form of mental readjustment.

As veterans return from war, the way they mentally frame the world for a more dangerous environment is adjusted.

So when you try to superimpose that mindset on a peacetime environment, you run into problems.

We begin to drown in worries about non-existent dangers.

Loss of trust in family and friends.

That said, civilian life is not without its dangers. There is

However, the probability of encountering them compared to combat is astronomically low.

Therefore, we never advise veterans to completely lift their guard.

However, we train them to adjust their attention depending on where they are.

If you find yourself in a bad area, improve that area.

Going out for dinner with your family?

Lower it considerably.

We train our veterans very rationally to systematically measure the actual statistical probability of encountering, say, an IED here in peacetime America.

With enough practice, the realignment will stick.

These treatments are followed by exposure therapy. This is a form of field training and one of the earliest proven treatments.

Remember Carlos?

This was his treatment of choice.

So we started by giving him challenging exercises like going to the grocery store, going to the mall, going to a restaurant, sitting with his back to the door.

And importantly, to stay in these environments.

Well, at first he was very insecure.

He wanted to sit where he could look around the room, plan an escape route, and get a makeshift weapon.

And he wanted to leave, but he didn't.

He overcame his discomfort by remembering his training in the Marine Corps.

And each time he did this, his anxiety lessened a little, then a little more, a little less, until he effectively re-learned how to sit in public and just enjoy himself.

He also listened to recordings of his combat experiences over and over again.

He listened until those memories ceased to cause him anxiety.

He overprocessed his memories so much that his brain didn't need to revisit those experiences while he was asleep.

And when I spoke to him a year after finishing treatment, he told me: "Doctor, this is the first time in 43 years that I haven't had a nightmare."

Now, this is different from erasing the memory.

Veterans will always remember their traumatic experiences, but with enough training, those memories are no longer as vivid or painful as they once were.

They emotionally don't feel like it happened yesterday and it's a very good place.

But it is often difficult.

And like any workout, it may not work for everyone.

And then there's the issue of trust.

Sometimes people ask me, "Teacher, if you've never been there, how can you help me?"

It is understandable.

But by the time we return to civilian life, we don't need those who were there.

No training required for battlefield operations. Need training on how to get home.

Over the last ten years of my work, I've seen every day detailed descriptions of the worst experiences you can imagine.

And it hasn't always been easy.

There were times when I felt like I was going to break my heart and that I had absorbed too much.

But these training-based therapies have worked so well, and whatever this job has done for me, it will keep coming back for more. Because you see people get better.

I see people's lives changing.

Carlos is now able to enjoy outings with his grandchildren that even his own children could not.

And what's amazing to me is that after 43 years of suffering, I was able to get my life back in just 10 weeks of intense training.

And when I spoke to him, he said, "I know those years are irreversible.

But at least now I can live in peace with whatever days I have left on this earth. ”

"I hope young veterans aren't waiting for the help they need," he said.

And that's my hope too.

because ...

Life is short, and if you are lucky enough to survive a war or some traumatic experience, you owe it to yourself to live it well.

And don't wait to get the training you need to make it happen.

Now, the best way to end human suffering caused by war is to never go to war.

But we as a species are not quite there yet.

Until then, we can lessen the emotional pain we cause when we send our sons and daughters into battle.

But we must ensure that the science, energy levels, and values ​​we send them to war at least reflect in how prepared they are to come back to us.

We owe them this much.

thank you.

(applause)

Chris Anderson: So John, I think this is scary.

Jonathan Haidt: Right.

CA: The world feels like it's in a place we haven't seen in a long time.

People disagree not only on the left-right political divide, as we are all familiar with it.

A much deeper difference is underway.

What the hell is going on, and how did we get here?

JH: It's not.

It has a more apocalyptic feel to it.

A research study by Pew Research also shows that how much we feel for another person is not just about hating them, it's about more than just hating them. We strongly dislike them and consider them a threat to our nation.

That number has continued to climb and is now over 50% for both.

people are afraid Because this doesn't feel like it used to. It's much more intense.

I apply the three basic principles of moral psychology whenever I tackle social puzzles, and I think they're helpful here.

So what we must always keep in mind when thinking about politics is that we are a tribe.

We evolved for tribalism.

One of the simplest and greatest insights about human social nature is the Bedouin maxim. "I to my brother, me and my brother to my cousin, me and my brother and my cousin to a stranger."

And because of that tribalism, we've been able to form big societies and band together to compete with other peoples.

It got us out of the jungle and out of our little group, but it means we're in perpetual strife.

The question you have to look at is what aspects of our society make it more painful, and what softens it?

CA: That's a very dark saying.

Does that mean it's actually hardwired into the wiring of most people's minds on some level?

JH: Oh, sure. This is just a basic aspect of human social cognition.

But we can live together in real peace, and we've invented all sorts of fun ways, like playing war.

So sports, politics, these are all ways of exercising the nature of this tribe without actually hurting anyone.

They are also good at trading, exploring, and meeting new people.

So we have to look at our tribalism as going up and down. We are not destined to fight each other all the time, but world peace will never come.

CA: The size of the tribe may shrink or expand.

JH: Yes.

CA: The size of what we think of as 'us' and what we think of as 'others' or 'them' can change.

And some believed that the process could continue indefinitely.

JH: That's right.

CA: And we were certainly expanding our tribal sense for a while.

JH: So I think we're probably reaching a new left-right distinction here.

So the left and right that we all inherited comes from the worker-versus-capital distinction, the working class, and Marx.

But I think what we're seeing now, in all Western democracies, is a divide between those who want to stay in the state and those who are more intolerant - and I don't mean that in a bad way - who have a more entrenched sense of it and who care about their towns, their communities and their nations.

And the anti-parochial people, and who... Whenever I get confused, I'm reminded of John Lennon's song "Imagine."

“Imagine, there is no country, nothing to kill or die for.”

And they want more global governance, they don't like nation-states and borders.

This can also be seen all over Europe.

There is a man who wrote a great allegory ten years ago in England - his name is actually Shakespeare.

He had the following metaphor: "Are we the drawbridge up or the drawbridge down?"

And the UK is split 52 to 48 on this point.

And America is divided on this point.

CA: So for those of us who grew up with the Beatles and that kind of hippie philosophy that dreamed of a more connected world, it was so idealistic that it felt like, 'How can you think badly about that?

And what you're saying is that millions of people today actually feel that it's not just stupid. It's actually dangerous and wrong and they're afraid of it.

JH: I think the big issue here, especially in Europe, is immigration.

And I think this is where the social science of diversity and immigration needs to look carefully.

Once something is politicized and becomes something the left and the right like, even social scientists can't think straight about it.

Well, diversity is good in many ways.

It obviously creates more innovation.

The American economy has grown tremendously since then.

Diversity and immigration bring many good things.

But I think the globalists don't see, and don't want to see, that ethnic diversity undermines social capital and trust.

There is a very important study by Robert Putnam, author of "Bowling Alone", looking at the Social Capital Database.

And basically, the more people feel they are the same, the more they trust each other, the more redistributive welfare states can be achieved.

What makes the Scandinavian countries so great is their tradition of being small, homogeneous countries.

And it's a progressive welfare state: 'Get off the drawbridge! The world is a wonderful place.

The Syrian people are suffering and we must accept them. ”

And that is beautiful.

But if I were in Sweden this summer, if the Swedish discourse is so politically correct that they can't talk about the downsides, it's going to bring in a lot of people as a result.

It cuts social capital, makes it harder to sustain the welfare state, and could result in a racially divided and visibly divided society, much like America.

Therefore, it is very uncomfortable to talk about this.

But I think this is also something that we should pay attention to, especially in Europe.

CA: So you're saying that rational people, people who think they're not racist but moral and upright people, have a rationale that humans are just too different. By mixing too many different people, we risk overloading our sense of human capabilities.

JH: Yes, but we can make it more plausible by saying it's not necessarily about race.

It's about culture.

There is an excellent study by a political scientist named Karen Stener. He shows that when people have a sense of unity, that they are all the same, many people tend to lean towards authoritarianism.

Those people are not particularly racist if they feel there is no threat to our social and moral order.

But when we break apart and bring them in experimentally thinking that people are becoming more and more different, they become more racist and homophobic and want to expel the deviants.

Therefore, you may receive an authoritarian response.

The Lennonist line, the left that follows John Lennon's line, is doing things that generate an authoritarian response.

We certainly see that with the alt-right in America.

We've seen it in England, we've seen it all over Europe.

But the more positive part of it is that I think localists and nationalists are actually right. So, race really doesn't matter much if we're going to emphasize our cultural similarities.

An assimilationist approach to immigration therefore solves many of these problems.

And if we value a generous welfare state, we must stress that we are all the same.

CA: Well, the increase in immigration and fear of it is one of the reasons for the current division.

What other causes?

JH: The next principle of moral psychology is that intuition comes first and strategic reasoning comes second.

You may have heard the term “motivated reasoning” or “confirmation bias”.

There's some very interesting research into how our high intelligence and language abilities evolved not to learn the truth, but to manipulate each other and protect our reputations...

We are really good at justifying ourselves.

And when you factor in the interests of the group, it's not just me, it's my team versus your team. On the other hand, if you are evaluating evidence that your part is wrong, we cannot accept it.

This is why you can't win political debates.

If you are arguing about something, you cannot persuade the other party with reasons or evidence. That's because reasoning doesn't work.

So now give us the internet, give us Google: "I heard that Barack Obama was born in Kenya.

Let me look it up on Google -- wow! 10 million hits! See, he was! ”

CA: So this was an unpleasant surprise for many.

Social media is often framed by technology optimists as a great force that brings people together.

And there were some unintended side effects to that as well.

JH: That's right.

That's why I'm so obsessed with the yin-yang or left-right view of human nature, the idea that both sides are right about certain things but blind to others.

That is why leftists generally believe that human nature is good and that if we unite people and break down walls, all will be well.

Right-wingers – social conservatives, not libertarians – social conservatives generally believe that people can be greedy, sexual and selfish, they need regulation, they need restrictions.

So when you take down all the walls and allow people to communicate all over the world, there will be tons of pornography and tons of racism.

CA: So please help me understand.

What are the changes that have deepened this sense of division?

JH: You have to make sure you have 6-10 different threads all coming together.

Here are a few.

So one of the biggest wars in America, actually in America and Europe, is World War II.

Interesting research by Joe Henrik and others shows that, especially if a country is at war when young, it will be tested whether it will be more cooperative 30 years later when it finds itself in either the commons dilemma or the prisoner's dilemma.

Due to our tribal nature, if so, my parents were teenagers during World War II and went out in search of aluminum shards for war aid.

In other words, we all worked together.

And these people go further and rise up through corporations and governments to take leadership positions.

They are very good at compromise and cooperation.

They will all retire by the 90's.

In other words, at the end of the 1990s, there will be baby boomers left.

From 1968 onwards, their youth was spent in domestic conflicts.

The loss of the “greatest generation” of the World War II generation is great.

That's one.

The other is the cleansing of both parties in America.

There used to be liberal Republicans and conservative Democrats.

So America had a truly bipartisan mid-century.

By the 90s, however, there were purified liberal and conservative parties, thanks to a variety of factors that set things in motion.

So now people from either party are really different and we don't want our kids to marry them, but in the '60s it didn't really matter.

So, the purification of the parties.

The third is the Internet. As I said earlier, the Internet is the most amazing stimulus for hindsight and demonization.

CA: The tone of what is happening on the Internet right now is very worrying.

A quick Twitter search about the election found two tweets side by side.

One responded to a photo of racist graffiti, saying, "This is disgusting!

#Trump's ugliness in this country. ”

And then there's "The Crooked Hillary Dedication Page. Disgusting!"

So this idea of ​​"disgust" bothers me.

Sometimes we get angry with someone because we have an argument or disagreement about something.

I've heard you say that disgust takes things to a deeper level.

JH: That's right. Aversion is different.

Anger -- You know, I have kids.

They fight 10 times a day and make love 30 times a day.

Angry, not angry, just going back and forth. You are angry, but you are not angry.

But hate is different.

Disgust paints the person as subhuman, monstrous, malformed, and morally perverted.

Disgust is like indelible ink.

There is a study on marital therapy by John Gottman.

A look at the faces predicts that if one of the couple shows a look of disgust or contempt, they will soon divorce, but a look of anger does not predict anything. Because if you manage your anger well, it's actually a good thing.

So this election is different.

Donald Trump personally uses the word "disgust" a lot.

He's very germ-sensitive, so disgust is very important - it's to him, it's unique to him - but as we demonize each other more and more, and again through the Manichean worldview, the idea that the world is a battle between good and evil becomes stronger and more likely to say they're wrong, I don't like them, but they're evil, they're demonic, they're disgusting, they're rebellious.

And we don't want anything to do with them.

I think that's why we're seeing it now, for example, on campus.

There is a growing urge to shut people off campus, silence them, and keep them away.

Unfortunately, I suspect that this generation of young people will not want to get involved in politics as they get older if their encounters with politics come with a great deal of disgust.

CA: So how do you deal with that?

Disgust. How do you ease your disgust?

JH: You can't do that for whatever reason.

In my opinion ...

I've been researching disgust for many years and have been thinking a lot about emotions.

And I think the opposite of disgust is actually love.

For example, love is...

Hate closes borders.

Love is melting walls.

So I think personal relationships are probably the most powerful means we have.

You may hate certain groups of people, but when you meet certain people, you realize that they are really nice.

And that gradually reduces or changes your category.

The tragedy is that Americans used to be more confused by left or right politics in the streets.

And at a time when there is such a huge moral divide, there is plenty of evidence that we are trying to get closer to people who are politically similar to us.

It's hard to find someone on the other side.

So they are there, but they are far away.

Getting to know them is even harder.

CA: What would you say to someone, or to Americans, to the general public, about what we should understand about each other to rethink this "disgust" instinct a little?

JH: Yes.

A very important point to keep in mind is a study by political scientist Alan Abramowitz, which shows that American democracy is increasingly dominated by so-called "negative partisanship."

That means you think, ``Okay, I have a candidate,'' and you like that candidate, and you vote for that candidate.

But with the rise of negative advertising and social media and all sorts of other trends, the way elections are run is one where either side tries to make the other suck, suck, and make you vote for my man by default.

And as we vote more and more against the opposite camp instead of our own, we have to keep in mind that if people are left, they think, “I thought the Republican Party was bad, but now Donald Trump is proving it.”

And now, Republicans, I can paint a picture of everything I think about Trump. ”

And that's not necessarily true.

They are generally not very happy with their candidates.

This is the most negative partisan election in American history.

Therefore, we must first distinguish between how we feel about the candidate and how we feel about the people given the choice.

And we all need to realize that we live in separate moral worlds. The metaphor I use in the book is that we are all trapped in a 'matrix', that each moral community is a matrix, a consensual hallucination.

And if you're within the Blue Matrix, it's all compelling that it's all the complete opposite - they're troglodytes, they're racists, they're the worst people in the world, and you have all the facts to back it up.

But there are people next door to yours who live within a different moral foundation.

They live in different video games and see completely different facts.

And each perceives different threats to the country.

And what I've found by standing in between and trying to understand both positions is that both positions are correct.

There are many threats to this country, but constitutionally neither side can see them all.

CA: So we almost need a new type of empathy?

Empathy is traditionally framed as "Oh, I feel your pain. I can stand in your shoes."

And we apply it to the poor, the needy, the afflicted.

We usually don't apply it to people we feel like other people or dislike.

JH: No, that's right.

CA: What happens when you build that kind of empathy?

JH: Actually, I think so...

Empathy is a very hot topic in psychology, and a very popular term, especially among leftists.

Empathy is a good thing, empathizing with a preferred layer of victims.

It is therefore important that we sympathize with the groups that we on the left consider so important.

It's easy because you get points.

But empathy should actually earn you points if you do it when it's hard.

I think so...

As you know, we have been dealing with racial and legal discrimination for 50 long years. It's been our number one priority for a long time, and it's still important.

But this year, I hope to make people aware that we are in existential danger.

Our left-right schism is, I believe, the most important schism we face.

There are still race, gender and LGBT issues, but this is an urgent need for the next 50 years and things will not get better by themselves.

So a lot of institutional reform needs to be done and we can talk about it, but it's kind of a long and volatile conversation.

But I think it starts with people realizing that this is a tipping point.

And yes, we need a new kind of empathy.

we need to recognize This is what our country needs and this is what it needs if you don't want it - raise your hand if you want to spend the next four years in anger and anxiety as you did last year - raise your hand.

So if you want to escape this situation, read Buddha, read Jesus, read Marcus Aurelius.

They have all kinds of great advice on how to get rid of fear, how to rebuild things, and how to stop seeing others as enemies.

There are many hints in ancient wisdom about this kind of empathy.

CA: This is my last question. What can people do personally to help heal?

JH: Well, it's very difficult to decide to overcome your deepest prejudices.

And there are studies now showing that political bias is deeper and stronger than racial bias in this country.

So I think we need to make an effort. That's what matters.

Make an effort to meet someone in person.

Everyone has a cousin, a stepbrother, someone on the other side.

So, when this election is over -- it's probably going to feel awful for either of you, so give it a week or two -- but wait a couple of weeks before you reach out and tell them you want to talk.

And before you do that, read How to Get Friends and Influence People by Dale Carnegie -- (laughter) I'm totally serious.

You can learn a technique if you start by acknowledging, or by saying, "Look, we often disagree, but there's one thing I really admire about you, Uncle Bob," or "For you conservatives, it's...". And you can find something.

It's magic if you start with gratitude.

This is one of the main things I have learned in relationships.

I still make a lot of silly mistakes, but now I am much better at apologizing and admitting someone is right.

Then the conversation goes really well and it's really fun.

CA: John, it's really interesting to talk to you.

It really feels like the land we are in is filled with deep questions about morality and humanity.

Your wisdom cannot be more useful.

Thank you very much for joining us this time.

JH: Thank you Chris.

JH: Thank you guys.

(applause)

For hundreds of years, economists have studied human behavior: how we make decisions, how we act individually and in groups, and how we exchange value.

They have studied the institutions that facilitate our trade: legal systems, corporations and markets.

But there is a new technological agency that will fundamentally change the way we exchange value, and it's called blockchain.

This is a pretty bold statement, but if nothing else comes out of this story, remember that blockchain technology, while relatively new, is also a continuation of a very human story. Here's the story.

As humans, we find ways to reduce uncertainty and exchange value with each other.

Now, one of the first to seriously explore the idea of ​​institutions as tools of economics to reduce mutual uncertainty and enable trade was Nobel economist Douglas North.

Although he died at the end of 2015, North pioneered the so-called "new institutional economics."

And what he called institutions were really only formal rules like constitutions and informal restrictions like bribery.

These institutions are in fact the lubricant that enables the wheels of our economy to work, and we can see this unfold in human history.

If you think back to when we were a hunter-gatherer economy, we were really just trading within the structure of the village.

We had some informal restrictions in place, but forced all transactions with violence and social repercussions.

As our society has become more complex and trade routes have become more distant, we have created more formal institutions, such as currency banks, governments and corporations.

These institutions helped us manage our trade as uncertainty and complexity increased and we had much less personal control.

Eventually the Internet will bring these same institutions online.

We built platform marketplaces like Amazon, eBay and Alibaba, but they are just faster institutions that act as intermediaries to facilitate human economic activity.

As Douglas North thought, institutions are tools that lower uncertainty and allow us to connect and exchange all kinds of values ​​in society.

And we believe we are now undergoing an even more fundamental evolution in how we interact and trade. Because for the first time, technology alone can reduce uncertainty, not just political and economic institutions such as banks, corporations and governments.

So what is blockchain?

Blockchain technology is a distributed database that stores a registry of assets and transactions across peer-to-peer networks.

It's basically a public registry of who owns what and who trades what.

Transactions are protected by cryptography, and over time their transaction history is locked into blocks of data that are then cryptographically linked and protected.

This creates an immutable and unforgeable record of all transactions on this network.

This record is replicated to all computers using the network.

It's not an app.

not a company.

I think the description like Wikipedia is the closest.

You can see it all on Wikipedia.

This is a composite view that is constantly changing and updating.

You can also track these changes over time on Wikipedia. You can also create your own wiki, as it is essentially just a data infrastructure.

Wikipedia is an open platform that stores words and images and their data over time.

Blockchain can be thought of as an open infrastructure that stores different types of assets.

It stores the history of the management of assets such as the digital currency bitcoin, ownership, location and other digital assets such as intellectual property ownership.

It can be a certificate, contract, real-world object, or even personally identifiable information.

Of course, there are other technical details in blockchain, but at its core, this is how blockchain works.

It is this public registry that stores transactions in the network and is replicated, making it highly secure and difficult to tamper with.

Now you have my gist of how blockchain can be expected to reduce uncertainty and thereby transform our economic system in a fundamental way.

So, while uncertainty is kind of an important term in economics, I would like to take a look at three forms of uncertainty that blockchain can play a role in, which we face in almost all of our day-to-day transactions.

We face uncertainties such as not knowing who we are dealing with, not being able to keep track of our transactions, and having no remedy if something goes wrong.

So let's look at the first example where you don't know who you're dealing with.

Suppose you want to buy a used smartphone on eBay.

I will try to find out where to buy it first.

Are they power users?

Do you have great reviews and ratings, or no profile at all?

Reviews, Ratings, Checkmarks: These are proofs of our identity that we collectively use today to reduce uncertainty about who we are dealing with.

But the problem is they are very fragmented.

Think about how many profiles you have.

Blockchain allows us to create an open, global platform that can store any certificate about any person from any source.

This allows you to create user-controlled portable identities.

More than just a profile, this means that you can selectively reveal various attributes (such as government-issued ID or age 21+) that help facilitate transactions and interactions by revealing cryptographic evidence that these details exist and are signed.

Having this kind of portable identity in the physical and digital world means we can conduct all kinds of human transactions in entirely new ways.

So far, we have talked about how blockchain can reduce the uncertainty of who we are transacting with.

A second uncertainty that we often face is that our interactions are not transparent.

Say that you will send the smartphone by mail.

I want some transparency.

I would like to know that the product I purchased is the same one that arrived in the mail and that there is some record of how it got to me.

This applies not only to electronic devices such as smartphones, but also to many different types of goods and data, such as pharmaceuticals, luxury goods, and all kinds of data and products that you do not want to be tampered with.

The problem for many companies, especially those that manufacture something as complex as smartphones, is managing all the different vendors across a horizontal supply chain.

Not everyone involved in manufacturing a product has the same database.

Not using the same infrastructure makes it very difficult to transparently see how the product evolves over time.

Blockchain allows us to create a shared reality between untrusted entities.

This means that all these nodes in the network do not need to know or trust each other. This is because each node has the ability to monitor and verify the chain itself.

Remember Wikipedia.

It's a shared database, with multiple readers and multiple writers at once, but the truth is one.

Therefore, blockchain can be used to create it.

You can create a distributed database with the same efficiency as a monopoly without actually creating a central authority.

So all these vendors, all kinds of companies can interact using the same database without trusting each other.

For consumers, this means even greater transparency.

As a real-world object moves, you can see its digital certificate or token move on the blockchain, adding value in the process.

This is a whole new world in terms of visibility.

So I've talked about how blockchain can reduce uncertainty around identity, and how it can change the meaning of transparency in long-distance and complex transactions like supply chains.

The final uncertainty we often face is one of the most endless and reversible.

What if you don't send me your smartphone?

Can you give me my money back?

Blockchain allows us to write code to create binding contracts between individuals and ensure that those contracts are enforced without a third party enforcer.

So if you look at the smartphone example, you can think of escrow.

You're financing the phone, but you don't have to release the funds until you're sure all the conditions are met.

I received a call.

I think this is one of the most attractive ways blockchain can reduce our uncertainty. Because it means that institutions and their enforcement can be disrupted to some extent.

This means that much of human economic activity will be collateralized and automated, and much human intervention will likely be pushed to the edge, where information moves from the physical world to the blockchain.

Perhaps what makes Douglas North question the use of this technology is the fact that what makes it work, what keeps blockchain secure and verified, is our mutual distrust.

So, rather than every uncertainty slowing us down and requiring institutions like banks, governments, and corporations, we can actually harness all that collective uncertainty and use it to collaborate and exchange information faster and more openly.

Now, despite the media saying that blockchain will end world poverty, I don't want you to get the impression that blockchain will solve everything, but it will also solve the counterfeit drug problem and potentially save the rainforest.

The truth is, the technology is in its infancy, and we need to see a lot of experimentation, and likely failure, before we truly understand all the use cases in our economy.

But there are a lot of people working on it, from financial institutions to technology companies to start-ups to universities.

One reason is that it's not just an economic evolution.

This is also an innovation in computer science.

Blockchain gives us the technological ability to record human interactions, currency exchanges, digital and physical assets of all kinds, and even our own personal attributes in entirely new ways.

So in a way they become technology organizations with many of the advantages of the traditional organizations we are used to in society, but this is done in a decentralized way.

This is done by turning many of our uncertainties into certainties.

So I think we need to start preparing. Because we are about to face a world in which decentralized, autonomous organizations play a very important role.

thank you.

(Applause) Bruno Giussani: Thank you, Bettina.

I hope you understand that it's coming, that it brings a lot of possibilities, and that it's complicated.

What is the expected adoption rate?

Bettina Warburg: I ​​think that's a very good question.

In fact, blockchain is a complex technology, so my lab focuses on going the corporate and government route first.

How many people actually understand how the Internet works?

But you use it every day, so I think we're faced with the same idea as John Sculley that technology should be invisible or beautiful. Blockchain is neither of those right now, so it's better suited to either really early adopters who have some understanding and tinkering, or finding the best use cases for identity, asset tracking, smart contracts, etc. that can be used at that level of enterprise or government.

BG: Thank you. Thank you for coming to TED.

BW: Thank you.

(applause)

The earliest time measurements were observations of cycles in nature, using patterns of change from day to night and season to season to construct a calendar.

Time could be measured more accurately, like sundials and mechanical clocks, and eventually time was put into more convenient boxes.

But what exactly are we measuring?

Does time exist physically or is it only in our minds?

The answer seems obvious at first, but of course time exists. It is constantly unfolding around us, and it is difficult to imagine the universe without it.

But thanks to Einstein, our understanding of time started to get complicated.

His theory of relativity tells us that time passes by for everyone, but it doesn't always pass at the same rate for people in many different situations, such as those traveling near the speed of light or orbiting a supermassive black hole.

Einstein solved the malleability of time by combining time and space to define space-time. Space-time can bend, but it behaves in a consistent and predictable way.

Einstein's theory seemed to confirm that time is woven into the very fabric of the universe.

But there are big questions that have not been fully resolved. Why can we move in any direction in space but only in one direction in time?

No matter what we do, the past is always stubbornly behind us.

This is called the arrow of time.

You instinctively know that if you put a drop of food coloring into a glass of water, the coloring will float from the drop and eventually fill the glass.

Imagine the opposite happening.

Here we perceive that time is unfolding backwards.

We don't live in a universe full of food coloring, we live in a universe spread out in water.

In physics, this is explained by the second law of thermodynamics, which states that systems gain disorder, or entropy, over time.

Our cosmic system is moving from order to chaos, and it is the cosmic properties that define the direction of the arrow of time.

So if time is such a fundamental property, it must be included in the most fundamental equations describing the universe, right?

There are currently two sets of equations that govern physics.

General relativity explains the behavior of very large things, while quantum physics explains the behavior of very small things.

One of the greatest goals of theoretical physics over the past half century has been to reconcile the two into one basic 'Theory of Everything'.

Many attempts have been made, but there are still unproven ways of dealing with time.

Curiously, one of the candidates, called the Wheeler-DeWitt equation, does not involve time at all.

Like all current theories, the equation is speculative.

But as a thought experiment, if that or a similarly time-hungry equation turns out to be true, does that mean that time doesn't exist at the most basic level?

Is time just some kind of illusion created by the limitations of the way we perceive the universe?

I don't know yet, but maybe that's the wrong way of thinking.

Rather than asking whether time exists as a fundamental property, perhaps it could exist as an emergent property.

An emergent property is something that does not exist in individual parts of the system, but does exist in the system as a whole.

Individual water molecules do not have tides, but the ocean as a whole does.

Film creates change over time by using a series of still images that appear to have fluid, continuous changes between them.

Our brain perceives the passage of time from a series of still images if we flip through the images fast enough.

The individual frames of the film do not change or contain the passage of time, but it is a property of how the pieces are stitched together.

The movement is both real and illusory.

Could the physics of time be a similar illusion?

Physicists are still investigating these and other questions, so we are far from a complete explanation.

At least for now.

There are currently 1.8 billion young people between the ages of 10 and 24 in the world.

It is the largest group in human history.

Meeting their needs will be a big challenge.

But it's also a big opportunity.

They hold our common future in their hands.

Every day we see articles about young people putting their ideas and passions to fight for change, social change, political change, and community change.

Imagine what they produce. A groundbreaking invention or invention.

Maybe new medicines, new transportation, new ways of communication, a sustainable economy and a peaceful world.

But this opportunity, this grace of youth, was not given.

180 million young women and young men stand at the door to adulthood.

Are you ready?

At the moment there are too few of them.

What I love most about my job at UNICEF is the opportunity to talk, meet and listen to young people from all over the world.

And they tell me about their hopes and dreams.

And they have great hopes and dreams about what they will achieve in life.

But what they tell me is that they have fear.

They feel they are facing a series of impending dangers.

A demographic crisis, an education crisis, a job crisis, a violence crisis, and a girls crisis.

When we look at these crises, we know they are urgent and need to be addressed now.

Because they tell us they are worried.

They fear that they will not get the education they need.

And what do you know?

they are right

Worldwide, 200 million adolescents, equivalent to the population of Brazil, are out of school.

And I feel that those who go to school are not getting the right skills.

Globally, 6 in 10 children and young people do not meet minimum proficiency in reading and mathematics.

No country can succeed if almost half of its population is illiterate.

But what about the lucky few who attend secondary school?

Many of them drop out, worried that they will not be able to acquire the skills they can use to earn a living.

And in some cases, parents can no longer afford to pay school fees.

It's a tragedy.

And young people are also saying that they are worried about employment and that they can't find a job.

And again, they are right.

Every month, 10 million young people reach working age.

It's a staggering number.

Some will go on to higher education, but many will find employment.

And our world isn't creating 10 million new jobs every month.

Competition is fierce for available jobs.

So imagine the youth of today needing a job, trying to earn a living, and being ready to build a future, but finding opportunities is hard.

Young people also tell us that they worry that they are not developing the skills they need.

And again, they are right.

We find ourselves in a time when the world is changing rapidly when it comes to work.

We are in the 4th Industrial Revolution.

Young people don't want to be on farms or in rural areas.

They want to go to the city.

They want to learn future skills for future jobs.

They want to learn digital technology and green technology.

They want the opportunity to learn modern agriculture.

They want to study business and entrepreneurship and start their own business.

They want to be nurses, radiologists, pharmacists, doctors.

And they want to have all the skills they will need in the future.

They also want to study professions such as construction trades or electricians.

These are all jobs that the country needs, and jobs that have yet to be invented.

And young people tell me that they are also worried about violence.

At home, online, at school, in the community.

And again, they are right.

Young people can have hundreds of friends on social media, but when they need to find a friendly face, someone to be there as a friend and talk to them, they can't find that person.

They face bullying, harassment, and more.

And hundreds of millions of people face exploitation, abuse and violence.

Every seven minutes, an adolescent boy or girl is violently killed somewhere in the world.

And girls tell me they are especially worried about their future.

And sadly, they are right too.

Girls face stigma and discrimination.

They marry at an early age and face a life-threatening premature pregnancy.

Imagine the population of the United States.

Now double it.

This is the number of women who married before their 18th birthday.

650 million.

And many became mothers when they were still children themselves.

One in three women will be physically or sexually abused during their lifetime.

Therefore, it's no wonder girls worry about their future.

These immediate crises may not be real in your life or your neighborhood.

And maybe you, too, had the opportunity to get a good education, marketable skills, and a job.

And you may never have faced violence, prejudice, or discrimination.

But there are tens of millions of young people who are not so lucky.

And they are sounding alarm bells for their future.

That is why UNICEF and many public and private partners are launching a new global initiative.

It was named by the young man himself.

And it's called Generation Unlimited, Gen-U, or Gen you.

So what they are saying is, "It's our time, it's our turn, it's our future."

Our goal is very simple.

We want all young people to be in school, learning, training and in age-appropriate employment by 2030.

This goal is urgent, necessary and ambitious.

But we think it's doable too.

That's why we look for cutting-edge solutions and new ideas.

An idea that gives young people a chance to fight for their future.

We don't have all the answers either, so we're asking businesses, governments, nonprofits, academia, communities and innovators to help.

Gen-U aims to be an open platform where people can come together and share ideas and solutions about what works, what doesn't work, and importantly what might work.

So if we can take these ideas, add a little seed money, add some good partners, add good political will, we think we can scale to reach thousands and millions of people around the world.

And with this project, I'm trying to do something new again.

We co-design and co-create with young people.

So with Gen-U, they'll be in the driver's seat and guiding us all the way.

In Argentina, a program connects students living in rural, remote, and inaccessible mountain communities with someone they rarely see: a middle school teacher.

Therefore, these students come to the classroom, are mentored by local teachers, and connected online to urban schools.

And then there are the secondary school teachers who teach them about digital technology and good secondary education without leaving their own communities.

And in South Africa there is a program called Techno Girls.

And these are girls from underprivileged communities, studying STEM program areas such as science, technology, engineering, and mathematics.

And they have an opportunity for job shadowing.

In doing so, they can see themselves in engineering, science, and possibly space program work.

In Bangladesh, we have partners who are training tens of thousands of young people in the industry to become motorcycle repairmen and mobile phone servicemen.

But it's also a chance to look at their own livelihoods.

And maybe even have your own business.

And in Vietnam, there are programs that combine young entrepreneurs with the needs of their local communities.

So this program brought a group together and decided to solve the traffic problem for people with disabilities in the community.

So they got a mentor and a little seed funding to develop a new app to help the whole community.

And we've seen how these programs make a difference.

When I was in Lebanon, I visited a program called Girls Got IT, or Girls Got It.

And in this program, girls studying computer skills and STEM programs have the opportunity to work alongside young professionals to learn first-hand what it's like to be an architect, designer, or scientist.

And when they see the smiles on their faces and the hot light in their eyes, they are so excited and hopeful for the future.

they want to change the world.

And now, thanks to this program and mentors, they will be able to do just that.

But these ideas and programs are just the beginning.

They reach only a fraction of the young people we are meant to reach.

We want to take these ideas and find a way to scale them up.

Reaching more young people in more communities in more places around the world.

And we want to dream big.

Can all schools be connected to the Internet anywhere in the world, no matter how remote or mountainous or even in a refugee camp?

Could we provide instant translation for young people so that they can get a good education in their native language anywhere in the world?

And is it possible to combine your school education with the skills you need to get a job in your area?

So that you can actually move from school to work.

more.

Is there a way we can support young people in our daily lives and workplaces?

Young people want us for apprenticeships, job shadowing, and internships.

can i do this?

Young people also want us to work and study programs – places where they can learn and earn.

Can we do this? And can we reach out to less fortunate communities nearby and help them?

Young people also say they want to help other young people.

They want more space and more voices so they can come together to help each other.

Not only in HIV centers and refugee camps, but also to stop online bullying and early marriage.

we need ideas. We need ideas big and small, local and global.

This is ultimately our responsibility.

A large group of young people are taking over our world.

It is our duty to leave a legacy of hope and opportunity, not only for them, but for them as well.

Young people make up 25 percent of the population.

But they are 100% our future.

And they want an opportunity to fight to build a better world.

Their mission should therefore be ours.

mission of our time.

The time is now and the need is urgent.

And 1.8 billion young people are waiting.

thank you.

(applause)

(music) We're a tribe they can't see We live on an industrial reservation We're a hallucinatory nation We've been called Indians We've been called Native Americans We've been called hostile We've been called heathens We've been called combatants We've been called by many names We're a hallucinatory nation We're human We're a hallucinatory nation Our DNA is the earth and the sky I Our DNA is past and future We are a hallucinatory nation We are evolving, continuing Hallucinating nation (music) Viruses have taken many forms Bears, moose, antelopes, elephants, deer Minerals, iron, copper, coltan, rubber Coffee, cotton, sugar People Germs travel faster than bullets People They harvest hillsides, guard crops, and herd cattle People Women and children were separated from men They divided us according to the regional filters of the mind Violence of arrogance Creeping Geospatial cortex Air snuggling We are not a conquered people The grounds were on fire The missionaries never hid their sights Prospectors of the land would rather see us disappear Recyclable prayer People This is my body given to you People This is my blood We are not a conquered people (Electronic music and chanting) It was on fire The grounds were on fire The Halluci N humans See the spiritual in nature Through the senses and senses All are related Everything on earth and in the air has a spirit Confronting alien nations Subjects and nations Seeing material religion Through trauma and paralysis Nothing to do Everything on earth and in the air has energy to be exploited Even they themselves have energy to be exploited Mining their souls and selling them to nothing is sacred Even their own alien nations sparse Ancestors live in DNA Evolutionary descendants of genetic memory Humans are our natural identity Natural identity is a force of existence waiting for human recognition To understand To understand not just to know but to be sacred Without religion we evolve Back to our ancestors With religion we disappear To religious heaven and hell (Electronic music and chanting) Humans We are humans We are of the earth (Electronic music and chanting) Humans We are humans We are of the earth Our bones, flesh, blood and metal , minerals, liquids, terrestrial things We are the earth We exist We are sky things Sun, moon, stars Reality Knowing how our ancestors lived We are children of the earth and sky We are hallucinatory nations (Applause) (Cheers) (Applause)

In the summer of 1895, crowds flocked to the Coney Island Boardwalk to see the latest marvel of roller coaster technology, the Flip Flap Railroad.

It was America's first loop coaster, but its thrilling flip came at a price.

The ride has caused numerous cases of severe whiplash, neck injuries and even ejections due to its characteristic loop.

Today, coasters can perform far more exciting tricks without resorting to the "thrill" of visiting a hospital.

But what exactly do roller coasters do to your body, and how did they become scarier and safer at the same time?

Gravity is at the heart of every roller coaster design.

Unlike cars and railroad trains, most coasters are propelled around tracks almost entirely by gravitational energy.

As the coaster climbs the first lift hill, it begins a professionally engineered cycle that stores potential energy on the climb and expends kinetic energy on the descent.

This rhythm repeats throughout the ride, performing a gravitational energy dance choreographed by coaster engineers.

But there are important variables in this cycle that aren't always carefully considered. That is you.

In the days of flip flaps, ride designers were most concerned about coasters getting stuck somewhere on the course.

This led early builders to overcompensate, throwing trains off hills or hitting the brakes when they reached stations.

But just like gravity affects a car, it also affects its passengers.

Also, in extreme conditions like coasters, the effect of gravity is doubled.

There is a common unit used by jet pilots, astronauts, and coaster designers called the "G-force".

A 1 G force is the familiar gravitational pull you feel when you're standing on Earth. This is the earth's gravitational force on our body.

But riders experience more or less gravity as they accelerate and decelerate.

Modern vehicle designers know that bodies can withstand up to about 5 G, but Flip Flap and its contemporaries routinely hit up to 12 G.

At these levels of gravity pressure, blood rushes from the brain to the feet, causing light-headedness and fainting as the brain struggles to stay conscious.

Also, oxygen starvation of retinal cells impairs their ability to process light, which can lead to gray vision or temporary blindness.

When a rider is turned upside down, blood rushes to the skull and can cause a bout of bright red vision called a "redout."

Conversely, a negative G creates weightlessness.

Within the body, short periods of weightlessness are mostly harmless.

Suspension of fluids in the inner ear, which regulates balance, can cause motion sickness in riders.

But the greater potential danger and thrill comes from what vehicle designers call "airtime."

When this happens, riders can typically be dislodged or thrown out of their seats if proper precautions are not taken.

Modern coasters are equipped with numerous belts and harnesses, which have largely solved this problem, but the ever-changing position of passengers can make it difficult to determine what needs to be tightened.

Luckily, modern ride designers are well aware of what your body and coasters can handle.

Coaster engineers pit these competing forces against each other to soften periods of intense pressure and create periods of no pressure at all.

It also avoids the extreme changes in speed and direction that were common in old-time thrill rides, as sudden changes from positive to negative G-forces can cause whiplash, headaches, and back and neck pain.

Modern vehicles are getting tougher with careful consideration of the amount of gravity they need to withstand.

At 5G, your body feels five times heavier. So if you weigh 100 pounds, the coaster will weigh 500 pounds.

Engineers should consider the multiplication of each passenger's weight when designing coaster supports.

However, these rides are not for everyone.

Adrenaline floods, lightheadedness and motion sickness don't go away anytime soon.

But today's redundant restraints, 3D modeling and simulation software make roller coasters safer and more thrilling than ever.

Our precise knowledge of the human body's limits has helped us build faster, taller, more loopy coasters, all without going off the rails.

Hi.

thank you.

[Jennifer Blair is sensitive to sound.

The live audience was asked to clap quietly in ASL style. ] So this was me five years ago.

I was a PhD student at Harvard University and loved to travel.

I had just gotten engaged to marry the love of my life.

I was 28 and, like many people when healthy, I felt invincible.

One day, I had a fever of 104.7 degrees.

Maybe I should have gone to the doctor, but I had never been sick in my life, and I knew that if I had the virus, I could just stay home and make some chicken soup and in a few days I would be all right.

But this time it didn't work.

For three weeks after the fever subsided, I was dizzy and could not leave the house.

I go straight into the door frame.

I had to cling to the wall just to go to the bathroom.

That spring, I had infection after infection, and every time I went to the doctor, he said, “Nothing at all.”

He underwent laboratory tests and the results were always normal.

All I had were symptoms that I could describe, but others couldn't see them.

I know it sounds silly, but I have to find a way to explain things like this to myself. So I thought maybe I was just getting old.

It may be like this on the other side of 25 degrees.

(laughs) Then the neurological symptoms started.

Sometimes I find that I can't draw the right side of the circle.

Other times, I couldn't speak or move at all.

I have seen all sorts of specialists, including an infectious disease specialist, a dermatologist, an endocrinologist, and a cardiologist.

I also saw a psychiatrist.

My psychiatrist said, "It's clear that you are really sick, but it's not mental.

I hope they find your problem. ”

The next day, a neurologist diagnosed me with conversion disorder.

He said the fever, sore throat, sinusitis, gastrointestinal, neurological, and cardiac symptoms were all caused by some distant mental trauma that I can't remember.

He said the symptoms were genuine but had no biological cause.

I was training to be a social scientist.

I studied statistics, probability theory, mathematical modeling and design of experiments.

I felt that I could not just refuse the neurologist's diagnosis.

It didn't seem true, but I knew from training that truth is often counterintuitive and easily overshadowed by what we want to believe.

So I had to consider the possibility that he was right.

That day, I conducted a small experiment.

I walked the two miles home from the neurologist's office and my legs were in this strange, almost electric pain.

I meditated on the pain and how my mind created all this.

The moment I walked through the door, I collapsed.

My brain and spinal cord were on fire.

My neck was so stiff that I couldn't put my chin against my chest, and even the slightest sound, like the rustling of sheets or my husband walking barefoot in the next room, could cause excruciating pain.

For the next two years, he spent most of his time in bed.

How could my doctor have been so wrong?

I thought I had a rare disease, one no doctor had ever seen.

And when I got on the internet, I learned that there are thousands of people around the world with the same symptoms, the same isolation, the same disbelief.

Some were still able to work but had to spend nights and weekends in bed in order to be ready for work the following Monday.

At the other end of the spectrum, there were those who were so ill that they had to live in complete darkness, unable to tolerate human voices or the touch of loved ones.

A diagnosis of myalgic encephalomyelitis was made.

You may have heard the name “chronic fatigue syndrome”.

For decades, it's a name meant to be the dominant image of a disease that can be as serious as this one.

A major symptom we all share is that every effort we put in, both physically and mentally, pays off.

If my husband goes for a run, it might leave my muscles sore for a few days.

If you try to walk half a block, you might be bedridden for a week.

It's the perfect custom prison.

I know a ballet dancer who can't dance, an accountant who can't add, a medical student who couldn't be a doctor.

It doesn't matter what you used to be. I can't do that anymore.

It's been four years since then, and I've never felt better than I did just before walking home from the neurologist's office.

It is estimated that approximately 15 to 30 million people worldwide suffer from this disease.

In the United States, where I'm from, there are about 1 million.

This makes it about twice as common as multiple sclerosis.

Patients can live for decades with preserved congestive heart failure function.

Twenty-five percent of us are homebound or bedridden, and 75-85 percent cannot even work part-time.

But doctors don't treat us, and science doesn't study us.

How could a disease so common and so tragic be forgotten by medicine?

When my doctor diagnosed me with conversion disorder, he drew on a line of thinking about the female body that dates back over 2,500 years.

The Roman physician Galen believed that hysteria was caused by sexual deprivation of particularly passionate women.

The Greeks believed that the uterus literally dried up, roaming the body in search of water, putting pressure on internal organs and causing symptoms ranging from – yes – extreme emotions to dizziness and numbness.

The cure was marriage and motherhood.

These ideas remained largely unchanged for thousands of years, until the 1880s, when neurologists attempted to modernize the theory of hysteria.

Sigmund Freud developed the theory that the unconscious can cause physical symptoms when dealing with painful memories or emotions that the conscious mind cannot handle.

I translated these feelings into physical symptoms.

This meant that men could be hysterical too, but of course women were still the most susceptible.

When I began researching my own illness history, I was surprised that these thoughts still persisted.

In 1934, 198 doctors, nurses, and staff at Los Angeles County General Hospital became seriously ill.

They had muscle weakness, neck and back stiffness, and fevers, all of which I had when I was first diagnosed.

Doctors thought it was a new strain of polio.

Since then, more than 70 outbreaks of remarkably similar post-infectious disease have been reported worldwide.

Both of these outbreaks tended to disproportionately affect women, and over time, when doctors could not find a single cause for the disease, they came to view them as mass hysteria.

Why is this idea so persistent?

I think it has something to do with sexism, but I also think that fundamentally doctors want to help.

They want answers, and this category allows doctors to treat what otherwise cannot be treated, or to explain unexplained ailments.

The problem is that this can cause real harm.

In the 1950s, a psychiatrist named Elliott Slater studied a cohort of 85 patients diagnosed with hysteria.

After nine years, 12 of them died and 30 were disabled.

Many had undiagnosed diseases such as multiple sclerosis, epilepsy, and brain tumors.

In 1980, hysteria was officially renamed "conversion disorder."

When my neurologist gave me that diagnosis in 2012, he was repeating Freud's words verbatim. And even today, women are two to ten times more likely to receive the diagnosis.

The problem with the theory of hysteria and psychogenic illness is that it can never be proven.

It is by definition lack of evidence and, in the case of ME, psychological explanations have hampered biological studies.

Worldwide, ME is one of the least funded diseases.

In the United States, it costs approximately $2,500 per year per person with AIDS, $250 per person with MS, and just $5 per person with ME.

It wasn't just lightning.

It wasn't just bad luck.

My ignorance of my illness is a choice, a choice made by the institutions that are supposed to protect us.

It is not known why ME can run in families, why ME is acquired after almost every infection, from enteroviruses to Epstein-Barr virus to Q fever, and why women are two to three times more likely than men.

This problem is much bigger than just my illness.

The first time I got sick, old friends reached out to me.

I quickly realized that I was part of a group of women in their late twenties who were shattered.

What struck me was how seriously we were taken.

I met a woman with scleroderma, an autoimmune connective tissue disease. For years she was told that everything was in her head.

Between onset and diagnosis, her esophagus was completely damaged and she would never be able to eat again.

Another woman had ovarian cancer and for years was told it was just premature menopause.

A college friend whose brain tumor was misdiagnosed for years as an anxiety disorder.

This is why it worries me. Since the 1950s, the prevalence of many autoimmune diseases has doubled or tripled.

Forty-five percent of patients ultimately diagnosed with an autoimmune disease are initially described as hypochondriac.

Like the hysteria of old, this is all about gender and who we believe.

Seventy-five percent of patients with autoimmune diseases are women, and in some diseases as many as 90 percent.

Although these diseases are skewed toward women, they are not women's diseases.

ME affects children, ME affects millions of men.

As one patient told me, symptoms come and go. Women are told they are exaggerating their symptoms, but men are told to stay strong and recover.

And men can be even more difficult to get diagnosed with.

My brain is not what it used to be.

This is the good part. Despite everything, I still have hope.

A great many diseases were once thought to be mental until science unraveled their biological mechanisms.

People with epilepsy may be forced into institutions until electroencephalograms can measure abnormal electrical activity in the brain.

Multiple sclerosis could be misdiagnosed as hysterical paralysis until brain lesions were discovered on a CAT scan or MRI.

And recently, it was thought that stomach ulcers were simply caused by stress, but it turned out that the culprit was Helicobacter pylori.

ME has not benefited from science like other diseases, but that is beginning to change.

In Germany, scientists are beginning to find evidence of autoimmunity, and in Japan, they are beginning to find evidence of brain inflammation.

In the United States, scientists at Stanford University have found abnormalities in energy metabolism that are 16 standard deviations from normal.

And in Norway, researchers are conducting a phase III clinical trial of an anticancer drug that has given some patients complete remissions.

What also gives me hope is the resilience of the patients.

Online we got together and shared stories.

We devoured what research there was.

we experimented ourselves.

We became our own scientists and our own doctors because we had to.

And then slowly, 5 percent here, 5 percent there, and finally I was able to leave the house on a nice day.

I still had to make a ridiculous choice: sit in the garden for 15 minutes or wash my hair today?

But it gave me hope that there is a cure.

I had a sick body. that was all.

And with the right kind of help, maybe one day I'll get better.

I united with patients around the world and started the fight.

We've filled that void with something great, but it's not enough.

I don't know if I'll ever be able to run again, walk any distance, or do athletic things that I can only dream about now.

But I am very grateful to have come this far.

The progress is slow, there are ups and downs, but it's getting a little better every day.

I remember when I was locked in that bedroom, months after I had seen the sun.

I thought I would die there.

But I am here with you today, it's a miracle.

If I hadn't been the lucky one, if I had gotten sick before the internet came along, if I hadn't found my own community, I don't know what would have happened.

I would have probably already taken my own life, as many others have.

Decades ago, how many lives could have been saved if we had asked the right questions?

How many lives could we save today if we decided to make a serious start?

Even if the true cause of my illness were to be discovered, if we do not change our institutions and culture, we will repeat the same thing with another illness.

By living with this disease, I learned that science and medicine are deeply human activities.

Doctors, scientists and policy makers are not immune to the same prejudices that affect us all.

We need to think about women's health in a more nuanced way.

Our immune system is as much a battlefield for equality as the rest of our bodies.

It is necessary to listen to what the patient has to say and be willing to say, "I don't understand."

"I don't know" is a beautiful thing.

Discovery starts with "I don't know".

And if we can do that, and approach the vastness of all that we do not know, then we may be able to welcome uncertainty with amazement rather than fear.

thank you.

thank you.

I am very excited to be here.

Everything is much bigger in America than in Europe.

Look at me -- I'm huge!

(laughs) That's great!

And TED Talks -- At TED Talks, everyone has great ideas.

So the question is, where do those great ideas come from?

This is a bit controversial, but it's generally believed that the average person, which is me, has about 50,000 thoughts per day.

That's a lot, but you can see that 95% of it is the same as what you ate the day before.

(laughter) And a lot of my work is really boring, okay?

I think things like, "Oh yeah, I need to clean the floor."

oh! I forgot to walk my dog. ”

My favorite is "Don't eat that cookie".

(Laughter) So, 95 percent repetition.

That means we only have 5% chance each day to actually think of something new.

And some of my new ideas are useless.

The other day, I was watching sports on TV and was wondering why I don't participate in sports.

Some of them are of interest to me.

This is strange.

(laughs) Do you think it's worth being so flexible just to see your heels at that angle?

(Laughter) And the problem is, I can never sympathize. Because I can never do that.

Well, not twice, in any case.

(Laughter) But I'm telling the truth.

The truth is, I wasn't very good at sports.

I've reached a wonderful age where all my friends say, "Oh, I wish I was as healthy as I was when I was 18."

And then I always feel complacent.

(Laughter) I'm just as healthy as I was -- (Laughter) (Applause) I couldn't run then. Of course I'm not going to do it now.

(Laughter) So I came up with a new idea. Why not get people like me involved in sports?

I think what the world needs now is an Olympics for people with zero athletic ability.

(laughs) Oh, it would be more fun.

There are three basic rules.

Obviously no drugs. No corruption, no skill.

(Laughter) It's -- no, it's a terrible idea.

I also understand why I don't participate in sports when I watch them on TV.

That's probably because 97 percent of it is about men running, men kicking things, and men trying to look neatly packaged in Lycra.

There is -- (Laughter) It doesn't always work.

It's -- (laughter) there's so little women's sport on television that it's no wonder young women watching it think, if I'll put it right, that the male members are the very levers that get you off the couch and onto the playing field.

(Laughter) The inequality in sports is amazing.

So this is what happens to me. You come up with an entirely new idea and then quickly revert to the old one.

As a matter of fact, there is no country, now or in history, where women are equal to men.

not one.

196 countries, throughout evolution, that has not happened.

Well, here is the evolution diagram.

(laughs) We women don't even do that!

(Laughter.) It's strange that men have evolved so beautifully.

So -- (laughter) it bothers me, and I know something has to be done about it.

But I'm busy, okay?

I have a fulfilling career, 3 kids and an elderly mother.

In fact, to be honest, one of the reasons I'm here is because a TED Talk told me I could have 15 minutes of my time, but I never have -- (Laughter) (Applause) So I'm busy.

Anyway, I was already trying to change the world.

Now comes the problem.

Everyone has what I call a "launch button" inside of them.

This is the button to press when you think, "I have to do something about this."

pressured for a variety of reasons.

Maybe you face some kind of inequality, you come across some kind of injustice, sometimes you get sick, or you are born in some way disadvantaged or born into a disadvantaged environment.

I mean, I was born gay, okay?

I always knew, but I don't think my family was in the least bit surprised.

This is a photo of my 4 year old.

I'm cute on the outside, but deep down I really believed I looked like Clint Eastwood.

(Laughter) So my activation button was pushed when my children were born. Three wonderful children from my then partner.

Now, to get to the point, I work in television in the UK.

By the time they were born, I was already hosting my own shows and working in the public eye.

I love my job, but more than that, I love my children.

And I didn't want them to grow up with secrets.

When my youngest son was born in 1994, as far as I knew, there was not a single openly gay woman in the UK.

I don't think keeping secrets is a good thing.

I think they are cancer of the soul.

So I decided to go outside.

Everyone warned me I would never work again, but I decided it was worth the risk.

Well it was hell.

There is a particularly vicious section of the right-wing press in the UK that has gone mad.

And their hatred fueled an unstable section of society, and we received death threats. It was such a death threat that I had to take my children and go into hiding, and I needed police protection.

And I promise there were many moments in the stillness of the night when I was horrified by what I had done.

The dust has finally settled.

Against all expectations, I kept working and my kids were and will continue to be absolutely wonderful.

When my son was 6 years old, I remember a friend coming over to play.

they were in the next room. I heard them chatting.

A friend said to his son, "What is it like to have two mothers?"

I wanted to ask a few questions, so I leaned forward and my son said, "It's great because if one of us gets sick, the other one will cook for us."

(Laughter.) That's where my gay equality activism button was pushed, and I, along with many others, have been campaigning for gay rights, especially the right to marry the person I love, for years.

We finally succeeded.

And in 2014, the day the law was changed, I married the wife I truly love.

(Applause.) We didn't do it quietly, we did it on stage at the Royal Festival Hall in London.

It was a great event.

The hall can accommodate 25,000 people.

We invited 150 family and friends and made it public. Anyone who wants to come and celebrate is welcome to do so.

It was free for anyone who wanted to come.

25000 people gathered.

(Applause.) There were all kinds of people imaginable, gays, straights, rabbis, nuns, marrieds, blacks, whites, the entire human race.

And I remember standing on that stage and thinking, "Wow, this is amazing."

My job is done.

love wins

The law has changed. ”

And I -- (applause) And I really thought my activation days were over, okay?

So every year I host a wonderful concert in the same hall to celebrate International Women's Day.

We have assembled the world's only all-female orchestra, playing amazing music by forgotten and overlooked female composers, and an amazing conductor, with Marin Alsop from Baltimore conducting and Petula Clark singing. And I give a lecture on the history of women.

I love collecting inspirational stories from the past and telling them.

I often think of history as what I call the Mount Rushmore model.

It looks majestic, but the women are completely ignored.

And I was giving a talk on women's suffrage in 2015. You know the wonderful women who fought hard for the right of women to vote in the UK.

And their slogan was "deeds, not words."

And surprisingly, they succeeded because in 1928 women actually won the right to vote.

So I'm giving this talk about this, and as I was speaking, I realized that this wasn't the history lecture I was giving. This was not where the job was done.

This was still a lot of work to do.

For example, there is no country in the world where women have equal representation in positions of power.

So let's take a quick look at the top 100 companies on the London Stock Exchange in 2016.

Top 100 Companies: How many women are running the business?

Seven. OK. Seven. I think that's fine.

Until I realized 17 was run by a man called "John".

(Laughter) There are more men named John who run FTSE 100 companies -- (Laughter).

There are 14 shops run by a man called "Dave".

(Laughter) Well, I'm sure Dave and John are doing a great job.

(laughter) Okay. Why is it important?

Well, it's a thorny issue of the gender pay gap.

Nowhere in the world do women earn the same income as men.

And that will never change unless there are more women at the top of boards.

We have many laws. The UK passed the Equal Pay Act in 1975.

Nevertheless, from the beginning of November until the end of the year, a significant number of women were still working virtually unpaid compared to their male colleagues.

In fact, the World Economic Forum estimates that women will finally be able to earn equal pay.

2133!

yay!

(Laughter) That's a terrible number.

And the problem is, the day before I spoke, the World Economic Forum revised it.

That's fine, because it sucks -- 2133.

Do you know what they revised it to?

2186。

(Laughs) Well, 53 years to go.

The current system does not provide equal pay for the lives of our grandchildren's grandchildren.

And I've waited long enough.

I have waited long enough in my business.

In 2016, I became the first woman to host a primetime panel show on British television.

Isn't that great? Great, I'm excited.

But -- (applause) But it's 2016! First!

TV is 80 years old!

(Laughter) Television may not be that important, but it's kind of a symptom.

In 2016, the United Nations was looking for new ambassadors to represent women's empowerment and gender equality, but who did they choose?

Wonder Woman.

Yes, they chose cartoons, okay?

(Laughter.) Because there weren't the right women for the job.

The percentage of women in positions of power is surprisingly low.

It is true in Parliament, and certainly true in the British Parliament.

In 2015, more men were elected to parliament that year than the total number of women who have ever held parliament.

Why is it important?

The problem is, if they're not at that table, literally in England cooperating with legislation, don't be surprised if women's perspectives are ignored.

Seeing responsible women would be a great example for young people.

In 2016, Britain elected its second female prime minister. Theresa May seized power.

The day she took power, all she had to do was do one thing.

Do one thing in your first 100 days in office to improve the lives of British women.

and what did she do? none.

none.

Because she's too busy cleaning up the mess the boys have made.

Even with women leaders, they always find better things to do than solve the vexing problem of inequality.

So I keep talking about equality as if it matters. is that so?

Now, let's take a quick look at the STEM industry.

science, technology, engineering, and mathematics.

It is very important in every aspect of our daily life.

The STEM industry has one of the thickest and incredibly well-documented glass ceilings.

What if the cure for cancer or the answer to global warming was in the head of a young, stagnant female scientist?

So I thought about all these things and convinced myself that I had to do "not words, but deeds."

And I spoke with a great friend of mine in the UK, a brilliant journalist, Catherine Mayer, and we were pretty dumb – and I suspect wine was involved – (laughter) and we decided to create a whole new political party.

Because there is something important here. The only place where women and men are completely equal is at the ballot box.

We had no idea what we were doing, or how complicated it was to start a political party.

"It's not that hard, men have been doing it for years," I thought.

(Laughter) So we started by calling it the Women's Equality Party.

Immediately people said to me, "Why did you call me that?"

I said, "I don't know. I just thought it would be clear."

(Laughter) We didn't want to keep what we were doing secret. I just -- (Laughter) Some people said, "You can't say that! You're too feminist!"

oh! Scary words! ah!

I can't tell you how many times I've heard the phrase, "I'm not a feminist, but..."

And I always think that if there's a "but" in the sentence, it can't be all garden roses.

And I started getting the hilarious question, "Are you guys going to burn bras?"

yes! Because bras are notorious for being made from flammable materials.

(Laughs) That's why all women sparkle every time they walk.

(Laughter) Here's a quick historical side note: No woman burned her bra in the '60s.

It's a story made by a journalist.

Thankfully, journalism has improved since then.

So -- (laughter) as soon as we announced what we were going to do in our broadcast interview, the emails started coming in.

First there were hundreds, then thousands, from all ages, from very young to women in their 90s and hundreds of wonderful men.

People wrote letters and said, "Can you help me?"

May I visit the party headquarters? ”

We didn't have a headquarters. There was no party.

we had nothing.

All we had was a close-knit group of great friends in pajamas trying to answer emails 24/7.

We were all busy.

Many of us have careers and have children, but we did the same as women and shared the work.

And almost immediately we agreed on one basic thing.

First of all, we want to be the only political party in the world whose main purpose is no longer to exist.

Great idea.

We wanted to be the only party with no particular political leanings.

We wanted people of all ages, from the left, from the right, from the middle.

Because the point was to work on a simple agenda. In other words, let's achieve equality in all aspects of life. After that, go home and do other household chores.

(Laughter.) And we wanted to change the way politics works.

I don't know if you know this, but there are two main political parties in England.

They are political dinosaurs.

And the way they talk to each other is shameful and toxic.

I don't think you've ever been called that bad -- (laughter) and you're lying here.

Wouldn't it be great if a politician said, "You know, my opponents have a point."

Let's see if we can work together to get the job done. ”

(Applause.) And let's get more women into politics.

Get more women into politics right away by being the only party to offer free childcare to candidates so they can get out of their homes and start campaigning.

(Applause.) Within 10 months, we had over 70 chapters of our party across Britain.

We stood for election in May 2016 in London, Scotland and Wales.

One in 20 voted for the mayor of London.

And the men who took part in the election, seeing how many votes we were getting, surprisingly started talking about the need to work on gender equality.

(Applause.) You know, since I was a kid, I've been promised to change.

There was always a time when women would stand shoulder to shoulder with men.

All I got was empty promises and disappointments. It was enough of a disappointment to set up a political party.

But here is my new idea for today. This is my 5 percent, okay?

And this is really good.

Actually, this is not enough.

Establishing one political party is not enough to achieve equality in a single country.

What we need is a major change in the political landscape of the world.

The great thing about our model is that it works everywhere.

It will work in America, it will work in Australia, it will work in India.

It's as if you've crafted the perfect recipe. Anyone can make it and it's delicious for everyone.

And we want to give it away.

If you want to know what we did, we'll publish it.

Can you imagine if you could mobilize millions of women around the world and say, "Enough!" to a traditional political struggle?

"Stop arguing, let's get the job done," they say.

We can literally change the world.

And I want it.

(Applause) I want...

(Applause.) I want that for my daughters, and I want that for my sons.

Because the truth is equality is better for everyone.

Come on guys, let's get active! Let's change the world!

We know we can do it and we want to do it.

(applause)

I would love to try something new.

Please stand up if you can.

Well, let's name a few.

I can't say anything when I hear a name I don't know, so I want you to sit down and sit down.

Last person left, let's see what they know. OK?

(Laughter) Okay.

Eric Garner.

Mike Brown.

Tamil rice.

Freddie Gray.

So those who are still standing should turn around and look.

I think half to most people are still standing.

Let's continue.

Michelle Kuso.

Tanisha Anderson.

Aura Rosser.

Megan Hockaday.

So I looked around again and there were still about four people standing. In fact, I'm not going to put you on the spot.

I'm only saying this to promote transparency, so you're welcome to take a seat.

(Laughter) For those of you who recognize the names of the first group, you know these are African Americans who have been murdered by police over the past two and a half years.

What you may not know is that another list includes African Americans who have been murdered within the last two years.

There's only one thing that separates the names you know from the ones you don't, and that's gender.

So the first thing I would like to say is that there is absolutely nothing definite about this audience that would explain the recognition patterns we have just seen.

I have done this training dozens of times all over the country.

I did it to women's rights groups.

I have worked with civil rights organizations.

I worked with my professors. I did it with my students.

I've done it with a psychologist. I've done it with sociologists.

I have done so with progressive lawmakers.

And everywhere, awareness of the level of police violence experienced by black women is extremely low.

Now, isn't it amazing that this is the case?

So there are two issues involved here.

Police violence against African-Americans and violence against women are two of the most talked about issues these days.

But when you think about who is involved in these issues and who is being victimized, these black women's names never come to mind.

Well, communication experts say people have a hard time incorporating new facts into their thinking about a problem when the facts don't fit the available frames.

These female names have slipped out of our consciousness because there is no frame for us to see them, no frame for us to remember them, and no frame for us to hold them.

As a result, reporters do not act with reporters, policy makers do not think of them, and politicians are not encouraged or required to speak to them.

Now, you may be wondering, why are frames important?

After all, isn't the issue that affects blacks and the issues that affect women necessarily include blacks who are women and women who are black?

Well, the short answer is that this is a trickle-down approach to social justice that often doesn't work.

Without a frame for understanding how social issues affect all members of the target group, many would fall through the cracks in our movement, effectively suffering in isolation.

But it doesn't have to be this way.

Many years ago I started using the term “intersectionality” to address the fact that many social justice issues such as racism and sexism often overlap, creating multiple levels of social injustice.

Well, the experience that created intersectionality was a chance encounter with a woman named Emma Degrafenreed.

Emma Degrafenreid was an African-American woman, working wife, and mother.

I actually read Emma's story from the legal opinion page written by the judge who dismissed Emma's allegations of racism and sexism against a local car manufacturing plant.

Emma, ​​like many African American women, sought better employment for her family and others.

She wanted to build a better life for her children and family.

However, she applied for a job but was not hired, believing she would not be hired because she was a black woman.

Now, the judge in question dismissed Emma's case, but the grounds for dismissal were that the employer had actually hired an African-American and that the employer had hired a woman.

But the real problem the judges were reluctant to admit was what Emma really meant: that all African Americans who were typically employed in industrial and maintenance jobs were men.

And the women usually hired for secretarial and front-office jobs were all white.

Only if the court could understand how these policies came together would it understand the double discrimination faced by Emma Degrafenreid.

But the court refused to allow Emma to tell her story by combining the two causes of action, because she believed that allowing it would give her preferential treatment.

She gains an advantage by making two swings at bat, while African-American men and white women can only make one swing at bat.

But of course, neither African American men nor white women needed to combine racist and sexist claims to tell the stories of discrimination they experienced.

Why didn't actual inequality laws deny protection simply because the experience of African American women is not quite the same as that of white women and African American men?

Rather than widening the box to include African American women, the court simply threw their case out of court entirely.

Now, as an anti-discrimination student, as a feminist, and as an anti-racist, I was struck by this incident.

It felt like an injustice doubled to me.

First of all, black women were not allowed to work in factories.

Second, the court further strengthened this exclusion by making it legally immaterial.

As a bonus, the problem had no name.

And we all know that if a problem has no name, it cannot be seen, and if it cannot be seen, it can hardly be solved.

Over the years, I have come to realize that the problem Emma is facing is that of framework.

The framework the courts used to view sexism and racism was partial and distorted.

For me, the challenge I faced was figuring out if there was another story, a prism that could make sense of Emma's dilemma, a prism that would get her out of the cracks in the law and allow the judges to understand her story.

It occurred to me that a simple intersection analogy might help the judges better understand Emma's dilemma.

So, if you think about this intersection, the roads leading to the intersection have a labor force organized by race and gender.

And running those roads are employment policies and other practices.

Now, being black and female, Emma was exactly where those roads converged and experienced the effects of both gender and racial traffic within the company at the same time.

Law is like an ambulance that shows up and treats Emma only if it proves that she was harmed on race roads or gender roads but not where those roads cross.

So what do you call being under the influence of multiple forces and surrendering to protect yourself?

Intersectionality seemed to work for me.

Furthermore, I learned that African American women, like other women of color and socially marginalized people around the world, face all sorts of dilemmas and challenges as a result of intersectionality, racial and gender intersection, heterosexism, transphobia, xenophobia and disabilityism. All these social dynamics together create a sometimes very unique challenge.

But just as intersectionality has raised our awareness of how black women live, it has also revealed the tragic circumstances under which African American women die.

Police violence against black women is very real.

The level of violence faced by black women is so high, it's no wonder some don't survive police encounters.

A 7-year-old black girl and a 95-year-old great-grandmother were also killed by police.

They are killed in living rooms and bedrooms.

They were killed in their car.

They were killed on the streets.

They were killed in front of their parents and killed in front of their children.

they were shot.

they were trampled.

they suffocated.

They were treated roughly until they died.

They were killed with tasers.

When I asked for help, I was killed.

Sometimes they were killed when they were alone, sometimes they were killed when they were with others.

They're killed for being black shopping, black driving, black mentally ill, black domestic violence.

Even though he was black, he was homeless and killed.

They were murdered after talking on their cell phones, laughing with friends, sitting in a car that had been reported stolen, and making a U-turn in front of the White House with a toddler strapped to the back seat of the car.

Why don't we know these stories?

Why do their lost lives provoke less media attention and social outcry than those of their dead brothers?

The time has come for change.

So what can we do?

In 2014, the African American Policy Forum began demanding to "say her name" at rallies, protests, conferences, gatherings, and anywhere state violence against black people is discussed.

But just saying her name isn't enough.

we need to be more proactive.

We are willing to and must bear witness to the often painful reality that many black women are reluctant to face, the daily violence and humiliation that many black women have to face beyond color, age, gender expression, sexuality and ability.

So we now have the opportunity to collectively witness some of this violence. Please bear in mind that some of the images I am about to share with you may be inspiring to some.

Hear the amazing Abby Dobson voice.

And as we sit with these women, some of whom have experienced violence and others who have not survived it, we have an opportunity to reverse what happened at the beginning of this talk—a situation where we were unable to stand up for them because we didn't know their names.

There will be a roll call at the end of this clip.

Several black women's names come up.

Participants are asked to say these names as loudly, randomly, and chaotically as possible.

Let us create cacophony to express our intention to lift these women up, sit with them, testify and bring them into the light.

(singing) Abbie Dobson: Now say her name.

Say, say her name.

(audience) Sherry!

(Audience) Kayla!

AD: Oh, please say her name.

(Audience shouts names) Say, say, say her name.

Please say her name

For a name I'll never know, say her name.

KC: Ayanna Stanley Jones, Janisha Fonville, Kathryn Johnston, Kayla Moore, Michelle Kuso, Lekia Boyd, Shelley Frey, Tarika, Yvette Smith.

AD: Please say her name.

KC: So, as I said at the beginning, if you can't see the problem, you can't solve it.

We have united to testify to the lives lost of these women.

But now is the time to move from grief and grief to action and change.

This is what we can do.

It's up to us.

Thank you for your participation.

thank you.

(applause)

I write about food. I write about cooking.

I take it pretty seriously, but I want to talk about something that has become very important to me in the last year or two.

I'm talking about food, but not about cooking itself.

Start with this beautiful photo of a cow.

I am not vegetarian. This is the old Nixon line, right?

But I still think this might be this year's version (laughs).

Now, this is a bit of an exaggeration.

And why do I say that?

For only once have the destinies of individual people and the destinies of humanity as a whole been so intertwined.

There were and still are bombs.

And where we go from here will determine not only the quality and length of our individual lives, but whether we will be able to recognize the Earth if we could see it a century from now.

This is another kind of Holocaust, and hiding under your desk doesn't help.

Let's start with the concept that global warming is not only real, but dangerous.

Now that every scientist in the world believes this, and even President Bush has seen or pretended to have seen the light, we can take this for granted.

So listen to this.

Livestock are the second largest contributor to air change gases after energy production.

Almost one-fifth of all greenhouse gases are produced by livestock production, more than by transportation.

Now, you can joke about cow farts all the time, but methane is 20 times more toxic than CO2, and it's not just methane.

Livestock are also one of the biggest contributors to land degradation, air and water pollution, water scarcity and biodiversity loss.

We have others, too.

Half of the antibiotics in this country are administered to animals, not humans.

But a list like this is kind of paralyzing, so let me just say this. If you're a progressive, driving a Prius, shopping eco-friendly, or looking organic, you should probably be semi-vegetarian.

Now, I'm not as anti-cow as I am anti-atom, but it's all in the way we use these things.

There's one more piece of the puzzle that Ann Cooper spoke so beautifully yesterday, and you already know it.

There is no question that so-called lifestyle diseases such as diabetes, heart disease, stroke and some cancers are far more prevalent in this country than in other parts of the world.

It is a direct result of the Western diet.

Our demand for meat, dairy, and refined carbohydrates—the world consumes a billion cans and bottles of cola a day—is not a need or a desire, but our demand for these things drives us to consume far more calories than is good for us.

And those calories are in foods that cause disease, not prevent it.

Global warming is now an unexpected event.

We didn't know that pollution doesn't just cause poor visibility.

You may have some lung disease here and there, but it's not that big of a deal.

But the current health crisis is more the work of an evil empire.

We were told and believed that the more meat, dairy and poultry we ate, the healthier we were.

No, overfeeding of animals and of course junk food is a problem, as is underfeeding of plants.

Now, I don't have time to go into the benefits of eating plants here, but there is evidence that plants, and I want to be clear about this, are plants, not components of plants.

It's carrots, not beta-carotene.

The evidence that plants promote health is very clear.

The evidence is overwhelming at this point.

You will eat more plants, eat less of other things, and live longer.

not bad.

Now back to animals and junk food.

What do they have in common?

The first is that you don't need either for good health.

You don't need animal products, and you certainly don't need white bread or cola.

Second, both are heavily marketed, creating unnatural demand.

We weren't born for Whoppers and Skittles.

3: Its production is supported by government agencies, at the expense of healthy and sustainable diets.

Now imagine the similarities.

Let's assume our governments have favored an oil-based economy while encouraging more sustainable forms of energy, knowing the consequences will be pollution, war and rising costs.

It's unbelievable.

And yet they do it.

And they do this here. It's the same deal.

The sad part is that when it comes to diet, even the well-intentioned Fed will fail when it tries to do the right thing for us.

They are either voted out by agribusiness puppets or they are agribusiness puppets.

So when the USDA finally acknowledged that it's the plants, not the animals, that make people healthy, it encouraged us through an oversimplified food pyramid to eat five servings of fruits and vegetables a day, along with more carbohydrates.

What they didn't tell us is that some carbs are better than others and that plants and whole grains should replace eating junk food.

But industry lobbyists will never allow it.

And what do you think?

Half of the people who developed food pyramids have ties to agribusiness.

So instead of substituting plants for animals, our appetites simply grew, and their most dangerous aspects remained the same.

So-called low-fat diets, so-called low-carbohydrate diets, these are not the solution.

But while many smart people look at whether the food is organic, local, or animal-friendly, the most important issue is never addressed.

Now, don't get me wrong.

I love animals, but I don't think it's a good idea to industrialize animal production and mass-produce them like wrenches.

But with 10 billion animals killed each year, there is no way to care for them.

That's our number. 10 billion.

If you connect all the chickens, cows, pigs, and lambs to the moon, you will go back and forth to the moon five times.

Now, my calculations are a bit fragile, but they're pretty good, depending on whether the pig is 4 feet or 5 feet long, but you get the idea.

It's just the United States.

And with overdose of animals causing greenhouse gases and heart disease, kindness can be a bit of a nuisance.

Find out how many animals you're killing for food, then decide if you're going to be kind to those left behind.

Another red herring may be exemplified by the word 'locavore', which was just named word of the year by the New Oxford American Dictionary.

seriously.

For those who don't know, a locavore is someone who eats only locally grown food. It's fine for people who live in California, but for everyone else, it's kind of a sad joke.

Between the official story, the Food Pyramid and the Hip Locavore Vision, there are two versions of how to improve our diet.

(laughter).

But they both get it wrong.

At least the former is populist and the latter is elitist.

How we got to this place is the history of American food.

And I'm going through at least the last 100 years or so now, very quickly.

What was it like 100 years ago?

Everyone was a locavore. Even New York has pig farms nearby, and shipping food here and there was a silly idea.

Every family had a cook, usually the mother.

And the mothers bought and prepared food for us.

It was like a romantic European vision.

Margarine was nonexistent.

In fact, when margarine was invented, several states passed laws declaring that margarine must be dyed pink, so everyone knew it was a fake.

There were no snack foods, no frozen foods until the '20s before Clarence Birdseye came along.

There were no restaurant chains.

There were restaurants nearby that were run by locals, but no one thought to open another one.

Eating ethnic was unheard of unless you were ethnic.

Haute cuisine was entirely French.

As an aside, anyone who remembers Dan Aykroyd imitating Julia Child in the 1970s will know where he got the idea to stab himself off this amazing slide.

(Laughter) Back then, before Julia, there was no food philosophy.

you just ate

you didn't claim anything.

There was no marketing; There were no national brands.

Vitamins had not yet been invented.

At least it wasn't federally sanctioned, and it made no health claims.

Fat, carbs, protein, they were neither bad nor good, they were food.

you ate food

As it was an ingredient, few had more than one ingredient.

Cornflakes hadn't been invented.

(Laughter) Pop Tarts, Pringles, Cheese Whiz, nothing like that.

A goldfish was swimming.

(Laughter) It's hard to imagine. People grew food and ate food.

And again we all ate local food.

In New York, oranges were a common Christmas gift. Because oranges came all the way from Florida.

From the 1930s onwards, the road network was extended, trucks replaced railroads, and perishable goods began to be transported more.

Orange has become common in New York.

The South and West became agricultural centers, while suburbs took over farmland in other parts of the country.

This effect is well known. they are everywhere.

And the death of family farms is also part of this puzzle, as is almost everything from the actual breakdown of communities to the difficulty of finding good tomatoes, even in the summer.

Ultimately, California produced too much food to ship fresh, so it became important to market canned and frozen foods.

Convenience was born.

It was marketed to proto-feminist housewives as a way to reduce household chores.

Well, I know everyone over the age of 45 and at this point they are drooling.

(Laughter) (Applause) Even more so with a slide of Salisbury steak, right?

(Laughter) But while this may have reduced the amount of housework, it also reduced the variety of food we eat.

Many of us grew up never eating fresh vegetables other than the occasional raw carrot or the odd lettuce salad.

For example, I'm not kidding, I didn't eat real spinach or broccoli until I was 19.

Who needed it? Meat was everywhere.

What could be easier, more filling, and healthier for your family than grilling a steak?

But by that time the cows were already raised in unnatural conditions.

Their stomachs were forced to eat soybeans and corn rather than spend their lives eating grass.

Of course, those grains were hard to digest, but that wasn't a problem for the growers.

The new medicine kept them in good health.

Well, they kept them alive.

Health was another story.

Thanks to agricultural subsidies, soybeans, corn and cattle have become kings, thanks to great cooperation between agribusiness and parliament.

And the chicken soon joined the throne.

It was at this time that the cycle of diet and destruction of the planet began, which we are only now realizing.

Listen to this, between 1950 and 2000 the world's population doubled.

Meat consumption increased fivefold.

Well someone had to eat it all so we got fast food.

And with this the situation was brilliantly resolved.

Home cooking was still standard, but the quality had declined noticeably.

Homemade bread, desserts, and soups are available at any store, so I eat less often.

Not that they were good, but they were there.

Most mothers, like me, cooked broiled meats, ready-made salads with bottled dressings, canned soups, and canned fruit salads.

It could be baked or mashed potatoes, or the dumbest food ever: minute rice.

For dessert, try store-bought ice cream and cookies.

I can say it now because I don't have a mother.

Cooking like this inspired me to learn how to cook for myself.

(Laughter) It wasn't all bad.

By the 70s, forward-thinking people began to recognize the value of local ingredients.

We knew we tended the garden, were interested in organic food, and were vegetarians.

We weren't all hippies, either.

Some of us have eaten at good restaurants and learned how to cook well.

On the other hand, food production was industrialized. industrial.

Perhaps because it was rationally produced as if it were plastic, food acquired magical and/or toxic powers.

Many people have become fatphobic.

Some people worshiped broccoli as a god-like being.

But they ate very little broccoli.

Instead, it was sold with yogurt, which tasted almost as good as broccoli.

However, in reality, the way the yogurt industry marketed yogurt was to transform it into something more like ice cream.

Similarly, take a look at granola bars.

I thought it was a health food, but looking at the ingredient list, it looks more like Snickers than oatmeal.

Sadly, it was at this time that the family dinner fell into a coma, if not actually killed. It was the beginning of the heyday of value-added foods, and we packed as much soy and corn products as possible.

Think frozen chicken nuggets.

The chicken is fed corn, the meat is ground, mixed with more corn products to add bulk and binder, and fried in corn oil.

All you do is nuke it. What could be better?

And horribly, pathetically, zapped.

By the 1970s, home cooking was in such dire straits that the amount of fat and spice in foods like McNuggets and Hot Pockets, and indeed everyone's favorites, made home cooking more appealing than the bland offerings at home.

At the same time, more women were entering the labor force, and cooking was not as important to men as a burden to share.

Well, there are pizza nights, microwave nights, grazing nights, do-it-yourself nights, and more.

Leading -- What's Leading?

Meat, junk food, cheese, exactly what will kill you.

So we are now looking for organic food.

that's good.

And as proof that things can really change, you can now find organic food in supermarkets and even fast food restaurants.

But organic food is also not the answer, at least by current definition.

let me ask you a question

Even if the feed itself is claimed to be organic, and the fish themselves are tightly packed in pens and swim in their own filth, can farmed salmon be organic if the feed has nothing to do with a natural diet?

And how much carbon would that salmon come from Chile, fly 5,000 miles after being killed there, and release it into the atmosphere?

don't know.

Of course, it's packed in Styrofoam before it arrives somewhere in the US and is trucked a few hundred miles further.

It may be organic in character, but it is never organic in spirit.

Well, this is where we all come together.

We are carnivores, organics, vegetarians, vegans, gourmands and just those who are interested in good food.

We have arrived at this issue from many different points, but it takes all of us acting on knowledge to change the way everyone thinks about food.

we need to start acting.

And this is not only, as Ann Cooper put it, a matter of social justice, but of course, she is perfectly right, it is also a matter of global survival.

Now I have come full circle and point directly to the core problem of overproduction and overconsumption of meat and junk food.

As mentioned earlier, 18 percent of greenhouse gases can be attributed to livestock production.

How many livestock do you need to produce this?

70% of the earth's agricultural land and 30% of the land surface are devoted, directly or indirectly, to raising the animals we eat.

And this amount is expected to double in the next 40 years or so.

And if the numbers coming in from China are what they are now, it won't be 40 years.

There is no good reason for us to eat so much meat.

I say this as a guy who has eaten a fair amount of corned beef in his life.

The most common argument is that we, on average, consume twice as much protein as even the industry-enthusiastic USDA recommends, yet we still need the nutrients.

But listen. Experts who are serious about disease alleviation recommend that adults eat just over half a pound of meat per week.

What do you think we eat in a day? half a pound.

But you don't need big, strong meat, do you?

Isn't eating meat essential to your health?

Does a diet rich in fruits and vegetables make us ungodly, effeminate, and liberal?

(Laughter.) Some might think that's a good thing.

But no, even if we were all steroid-laden footballers, the answer is no.

In fact, there are no diets on earth that meet basic nutritional needs without promoting growth, and many make them far healthier than our diets.

We don't eat animal foods to get enough nutrition, we eat animal foods to get strange forms of malnutrition that are killing us.

To protect individual and human health, Americans suggest reducing meat intake by 50%. This isn't enough of a reduction, but it's a start.

It may seem silly, but that's exactly what should happen, and what progressive people, progressive people, should do and claim, with the increased consumption of plants that comes with it.

I have been writing about food indiscriminately, more or less omnivorously, for about 30 years.

During that time, I have eaten and advised to eat everything.

I don't think I'm ever going to stop eating animals, but I think it's time to stop industrially raising animals and stop eating them carelessly, for everyone's benefit.

Ann Cooper is right.

The USDA is not on our side here.

We must not only advocate for a better diet for all, but we must take the problem into our own hands by improving our own diet.

And it's very easy.

Less meat, less junk, more plants.

It's a simple equation: eat food.

Eat real food.

We can continue to enjoy our meals, continue to eat deliciously, and eat even more deliciously.

We can keep looking for the ingredients we love and keep spinning about the meals we love.

Not only does it reduce calories, it also reduces your carbon footprint.

Instead of eating less, we value more, and in doing so we can save ourselves.

we have to choose that path.

thank you.

(music) About 43,000 years ago, a young cave bear died in the hills on the northwestern border of what is now Slovenia.

A thousand years later, a mammoth died in southern Germany.

Centuries later, a griffon vulture also died in the same vicinity.

And although we know very little about how these animals met their deaths, these different creatures dispersed across both time and space shared one amazing destiny.

After their death, the bones from each skeleton were worked into flutes by human hands.

Let's think about it.

Imagine you are a caveman 40,000 years ago.

You have mastered fire.

I created a simple tool for hunting.

I learned how to make clothes out of animal skins to keep me warm in the winter.

What will you invent next?

It seems absurd to invent the flute, a tool that produces useless vibrations in the air molecules.

But that's exactly what our ancestors did.

Well, this turns out to be surprisingly common in the history of innovation.

Sometimes a person invents something because he wants to survive, feed his children, conquer a neighboring village.

But in the same way, new ideas often come out simply because they're fun.

And what's really strange is that many of these playful yet seemingly frivolous inventions ended up causing profound changes in science, politics, and society.

Take, for example, the programmable computer, arguably the most important invention of our time.

Now, it's common knowledge that computers descended from military technology, as many of the early computers were specifically designed to crack wartime ciphers or calculate rocket trajectories.

But in reality, the origins of modern computers are much more playful and even musical than you might imagine.

The idea behind the flute, which produced sound by forcing air into tubes, was eventually modified, giving birth to the first organ over 2,000 years ago.

Someone came up with the brilliant idea of ​​pressing little levers with their fingers to make sounds, and invented the first musical keyboards.

Well, keyboards evolved from organs to clavichords to harpsichords to pianos, but by the mid-19th century many inventors finally came up with the idea of ​​using keyboards to trigger letters rather than sounds.

In fact, the first typewriters were originally called "writing harpsichords".

The flute and music provided even more powerful advances.

About 1000 years ago, at the height of the Islamic Renaissance, three Baghdad brothers designed a device that was an automatic organ.

They called it "a self-playing instrument."

Well, that instrument was basically a giant music box.

The organ can be trained to play different tunes using coded instructions by placing pins on the rotating cylinder.

And if you want the machine to play a different song, simply replace a new cylinder with a different code.

This instrument was the first of its kind.

It was programmable.

Now, conceptually, this was a big step forward.

This invention allows the whole concept of hardware and software to be considered for the first time.

And that incredibly powerful concept was never given to us as an instrument of war or conquest, or as a necessity.

It was born out of the strange pleasure of watching a machine play music.

In fact, the idea of ​​programmable machines has been kept alive almost exclusively by music for about 700 years.

In the 1700s, music-making machines became playthings for the Parisian elite.

Showman used the same coded cylinders to control the physical movements of an early type of robot called an automaton.

One of the most famous of those robots is, you guessed it, the automatic flutist designed by a genius French inventor named Jacques de Vaucanson.

And when de Vaucanson was designing the robot musician, he had another idea.

If you can program a machine to make pleasing sounds, why not program it to weave fun colored patterns out of cloth?

Instead of using cylinder pins to represent musical notes, we represent different colored threads.

If you want a new pattern on your fabric, simply program a new cylinder.

This was the first programmable loom.

Now cylinders were too expensive and time consuming to manufacture, but half a century later another French inventor named Jacquard had the brilliant idea of ​​using cards with holes punched in paper instead of metal cylinders.

Paper turned out to be a much cheaper and more flexible way to program devices.

This punch card system inspired Victorian inventor Charles Babbage to create the first truly programmable computer, the Analysis Engine.

And punch cards were used by computer programmers in the late 1970s.

So ask yourself these questions: What has modern computers really made possible?

Yes, military involvement is an important part of the story, but the invention of the computer also required other components: music boxes, toy robot flutists, harpsichord keyboards, and colorful patterns woven into fabric. It's only part of the story.

There is a long list of world-changing ideas and technologies born out of play, including public museums, rubber, probability theory, and the insurance business.

Necessity is not always the mother of invention.

The playful state of mind is fundamentally exploratory, seeking out new possibilities in the world around us.

And that quest is why so many experiences that began with simple pleasures and enjoyments ultimately lead us to deep progress.

I think this will affect how we teach our kids in schools and how we encourage innovation in the workplace, but thinking about play and joy in this way also helps us know what happens next.

please think about it. If you were sitting there in 1750 trying to make sense of the great changes that came to society in the 19th and 20th centuries—automatic machines, computers, artificial intelligence, the programmable flute that entertained the Parisian elite—they were as powerful a clue as anything else at the time.

It seemed entertainment at best and was seriously useless, but it turned out to be the beginning of a world-changing technological revolution.

The future is found where people enjoy it the most.

It is difficult to speak up.

It wasn't until just a month ago, when my wife and I were new parents, that I realized what this really meant.

It was a great moment.

It was exhilarating and exhilarating, but it was also scary and terrifying at the same time.

And it was especially terrifying when we got home from the hospital, unsure if our little baby was getting enough nutrition from breastfeeding.

I wanted to call my pediatrician, but I didn't want to make a bad first impression or come across as a crazy, nervous parent.

So we worried.

and we waited.

The next day, when we went to the doctor's office, she gave him formula right away as he was very dehydrated.

Our son is fine now and he reassured us that the doctor would be available at any time.

But in that moment, I should have spoken up, but I didn't.

But sometimes we raise our voices when we shouldn't. I learned that over ten years ago when I let my twin brother down.

My twin brother is a documentary filmmaker and got an offer from a distributor for one of his first films.

He was excited and ready to accept the offer.

However, as a negotiation researcher, I insisted on making a counter-proposal to him and helped him formulate the perfect proposal.

And it was perfect, it was totally insulting.

The company was so upset that they literally withdrew the offer, leaving my brother with nothing.

And I have asked people all over the world about this dilemma of speaking up. When can I assert myself, when can I assert my interests, when can I express an opinion, when can I ask ambitious questions.

And the range of stories is diverse and diverse, but at the same time constitutes a universal tapestry.

Can you correct your boss when he makes a mistake?

Can you face off against a colleague who keeps getting stuck?

Can I refute my friend's insensitive joke?

Can I confide my deepest insecurities to the person I love most?

And through these experiences, each of us has come to recognize that there is something called a range of acceptable behavior.

Well, we can be too strong sometimes. We push ourselves too hard.

That's what happened to my brother.

Even making an offer was beyond his tolerance.

But sometimes we are too weak.

That's what happened to my wife and I.

And if you stay within this acceptable range of behavior, you will be rewarded.

Deviating from that range is punishable in various ways.

We are dismissed, disrespected, and even ostracized.

Otherwise, you will lose that raise, promotion, or contract.

Well, the first thing you need to know is, "What is my range?"

But the important thing is that our range is not fixed. It's actually pretty dynamic.

Zoom in or out based on context.

And there is one thing that determines its extent above all else, and that is your power.

Your power determines your range.

what is power?

Power comes in many forms.

In negotiations, it comes in the form of alternatives.

Therefore, my brother had no other choice. He didn't have enough strength.

The company had many alternatives. they had power.

Sometimes it's new to the country, like immigration, or new to the organization, like my wife and I as new parents, and sometimes it's a new experience.

At work, someone can be your boss and someone can be your subordinate.

Sometimes one person in a relationship has more interest than the other.

And the important thing is that when we have great power, our range is very wide.

We have a lot of leeway in how we act.

But if we don't have enough power, our range of action will be limited.

We can hardly afford it.

The problem is that the narrower range causes what is called a low-power double-bind.

The double bind of low power happens when we go unnoticed if we don't speak up, but punished if we speak up.

Now, many of you have heard the term "double bind" and associated it with something, which is gender.

The gender double bind means that women who don't speak up are ignored and women who speak up are punished.

And importantly, women need to speak up just like men, but there are barriers to doing so.

But what my research over the past two decades has shown is that what appears to be a sex difference is not really a gender double bind, but a low-power double bind.

And often what appears to be a gender difference is actually just a hidden power difference.

A lot of the time, we look at the differences between men and women, or between men and women, and we think, "It's a biological cause. There's something fundamentally different about men and women."

But study after study has shown that power is actually needed to better explain many gender differences.

This is the low power double bind.

And a low-powered double bind means less range and less power.

Our range is small and our double bind is very large.

So we need to find a way to extend the range.

Over the last few decades, my colleagues and I have found two things really important.

The first is that you appear powerful in your own eyes.

Second, you look powerful in the eyes of others.

When I feel powerful, I feel confident instead of fearful. I will broaden my horizons.

It gives me more scope when others see me as powerful.

Therefore, we need tools that expand the range of acceptable behavior.

And today we will deliver a set of tools.

Speaking up is risky, and these tools help reduce the risk of speaking up.

The first tool I offer you was discovered in a key discovery during negotiations.

On average, women make more ambitious offers at the bargaining table, with worse outcomes.

But Hannah Riley Bowles and Emily Amanatura found one situation where women get the same results as men and are equally ambitious.

Then they defend others.

When advocating for others, they discover their own scope and expand it within their own hearts.

They become more assertive.

This is sometimes called the "mama bear effect".

We can find our own voice when we advocate for others, like a mother bear protects her cubs.

But sometimes you have to advocate for yourself.

How do we do that?

One of the most important tools we have to advocate for ourselves is something called perspective taking.

And taking perspective is very simple. It is simply seeing the world through someone else's eyes.

This is one of the most important tools you need to increase your reach.

When I put myself in your perspective and think about what you really want, you are more likely to give me what I really want.

But here's the problem. It's hard to set a point of view.

Now let's do a little experiment.

Please hold hands like this. Please put your finger up.

And I want you to draw a capital E on your forehead as soon as possible.

OK, it turns out that this E can be drawn in one of two ways. This was originally designed as a perspective test.

I'm going to show you two photos of someone with an "E" on their forehead. Erica Hall, a former student of mine.

And, as you can see here, that's the correct E.

I drew an E so that it looks like an E to others.

It's an E with a point of view because it looks like an E from someone else's point of view.

But this E here is a selfish E.

We tend to be selfish.

And we tend to focus on ourselves especially in times of crisis.

I would like to talk about one particular crisis.

A man walks into a bank in Watsonville, California.

And he said, "Give me $2,000 or I'll blow up the whole bank with a bomb."

Well, the bank manager didn't give him the money.

She took a step back.

She stood in his point of view and realized what was really important.

He requested a specific amount.

Then she said, "Why did you ask for $2,000?"

And he said, "My friend will be evicted if I don't give him $2,000 now."

Then she said, "Oh! You don't want to rob a bank, you want a loan."

(Laughter) "Would you like to come back to my office? Let me fill out the paperwork for you."

(Laughter) Well, her quick take in perspective calmed the precarious situation.

As such, you can be ambitious, aggressive, and yet likable when you put yourself in someone else's shoes.

Another way to be assertive and still be liked is to show flexibility.

Now let's say you're a car dealer and you want to sell someone a car.

Offering two options increases your chances of making a sale.

Consider option A. The car is $24,000 and comes with a 5 year warranty.

Or Option B: $23,000 and 3-year warranty.

My research shows that giving people a choice among options makes them less defensive and more likely to accept your offer.

And this doesn't just apply to salespeople. It works with parents.

When my niece was 4, she resisted wearing clothes and refused everything.

But my sister-in-law came up with a great idea.

What if I gave my daughter a choice?

Is it this shirt or that shirt? Yes, that shirt.

These pants or those pants? Yes, those pants.

And it worked beautifully.

She got dressed quickly without hesitation.

When I asked people around the world when it felt safe to speak up, the number one answer was "when the audience has social support or an ally."

Therefore, we want to acquire allies.

How do we do that?

Well, one way to do that is by becoming a Mama Bear.

Advocating for others expands our reach in our own eyes and in the eyes of others, but it also gives us powerful allies.

Another way to gain powerful allies, especially in high places, is to ask others for advice.

When we ask others for advice, they like us because we are flattering them and expressing humility.

And this actually works to resolve another double bind.

That's the double bind of self-promotion.

The double bond of self-promotion is that if you don't advertise your accomplishments, no one will notice.

If so, we would not be likable.

But you can be both competent and likeable in their eyes if you ask them for advice on one of your accomplishments.

And this is so powerful that it works even when you know it's coming.

There have been times in my life when people with lesser abilities have been warned to come to me for advice.

Notice three things about this. First, I knew they would come to me for advice.

Second, we did some research on the strategic benefits of asking for advice.

And the third still worked.

I took their perspective and became more invested in their cause, more committed because they asked me for advice.

Now, it is when we have expertise that we can speak with more confidence.

Our expertise gives us confidence.

When we are in high power, we already have trust.

All you need is good evidence.

Without power, there can be no trust.

I need good proof.

And one of the ways we are recognized as professionals is by tapping into our passion.

In the next few days, I would like you to go to your friend and say, "I would like you to describe your passion to me."

I asked people all over the world to do this and ask, "What did you notice about someone when you described them as having a passion?"

And the answer is always the same.

"Their eyes brightened and grew."

They smiled broadly.

“They used their hands here and there.

"They speak fast with a slightly higher pitch."

(Laughter) "They leaned over as if to tell us a secret."

And I said to them, "What happened to you when you heard their passion?"

They said, "My eyes lit up.

I leaned forward. ”

When we unleash our passion, we not only give ourselves the courage to speak up, but we also gain permission from others to speak up, in our own eyes.

Even when we seem too weak, harnessing our passions can be effective.

Both men and women are punished for crying at work.

But Lizzie Wolfe has shown that when we frame our strong emotions as passions, men and women alike lose their condemnation of tears.

Finally, I would like to end with the words my late father said at my twin brother's wedding.

Here is our photo.

My father was a psychologist just like me, but his true love and true passion was cinema, just like my brother.

So he wrote a speech for my brother's wedding about the roles we play in the human comedy.

And he said, "The lighter the touch, the better and richer you can perform.

People who accept their role and work to improve their performance grow, change, and expand themselves.

Play well and your day will be a lot of fun. ”

What my father used to say is that we all have assigned scopes and roles in this world.

But he also stated the essence of this talk. Their roles and scope are constantly expanding and evolving.

So when you need the scene, be the ferocious mama bear and the humble advice seeker.

You have good evidence and powerful allies.

Be a passionate point of view.

And with these tools, and each of you being able to use these tools, the range of acceptable behavior will expand and your days will become more or less enjoyable.

thank you.

(applause)

I have an important question here.

[Is it ethical to evolve the human body?] Because we are beginning to have all the tools to evolve ourselves.

And we can evolve bacteria, we can evolve plants, we can evolve animals. And we're now at the point where we really have to ask ourselves, is it really ethical and do we want humans to evolve?

Now that you're all thinking about it, let's talk about it in the context of prosthetics, the past, present, and future of prosthetics.

So this is an iron hand that belonged to one of the German counts.

He loved to fight, but in one battle he lost an arm.

No problem. He made the armor and just put it on and got a perfect prosthetic leg.

That's where the concept of ruling with an iron fist comes from.

And, of course, these prostheses are becoming more and more convenient and more and more modern.

You can also add a soft-boiled egg.

All sorts of control is possible, and while you're thinking about it, there are amazing people like Hugh Herr building totally extraordinary prosthetic legs.

So the wonderful Amy Mullins will come out and say, How tall do you want to be tonight?

Or will Hugh say what kind of cliff I want to climb?

Or maybe you want to run a marathon or ballroom dance?

And as we adapt these things, the interesting thing about prostheses is that they are built into the body.

These external prostheses are therefore now knee prostheses.

I got an artificial hip joint.

And they have evolved further, not only convenient to have, but also indispensable.

So when we talk about a cardiac pacemaker as a prosthetic, we're not just talking about "I'm missing a leg", I'm talking about "without it I could die".

At that point, the prosthetic leg becomes a symbiotic relationship with the human body.

And four of the brightest people I've ever met - Ed Boyden, Hugh Herr, Joe Jacobson, and Bob Lander - are working to establish the Extreme Bionics Center.

What's interesting about what you're seeing here is that these prostheses are built into the bone.

It will melt into your skin.

They are incorporated into muscles.

And the other side of Ed is thinking about how to use light and other mechanisms to connect the brain directly to things like these prosthetics.

Once we can do that, we can begin to change a fundamental aspect of humanity.

So how quickly you react to something depends on the thickness of your nerves.

And of course, if you're using external nerves or artificial nerves, e.g. light or liquid metal, you can increase their diameter, and in theory even expand them to the extent that they don't interfere with the bullet as long as you can see the muzzle flash.

These are the magnitudes of change you are talking about.

This is the fourth type of prosthesis.

These are Phonak hearing aids. The reason this is interesting is because it goes beyond the threshold that prosthetics are for 'disabled' people and becomes something that 'ordinary' people might actually want to have. The function of this prosthesis is very interesting because it not only helps you to hear, but also allows you to focus your hearing so you can hear the conversation going on over there.

You can get super hearing.

You get 360 degree hearing. White noise may occur.

You can also record, and by the way, this includes a phone call.

So this works both as a hearing aid and as a phone.

And at that point, someone might actually want to voluntarily wear a prosthetic leg.

With all these thousands of loosely connected little pieces coming together, it's time to ask the question: How do you want humanity to evolve over the next century or two?

To that end, we turn to a great philosopher who is a Yankee fan, yet extremely wise.

(Laughter) And Yogi Berra, of course, used to say that it's very difficult to make predictions, especially about the future.

(Laughter) So instead of predicting the future in the first place, let's think about what's happening today with people like Tony Atala redesigning 30-odd organs.

And perhaps the ultimate prosthesis is not having something external, titanium.

Perhaps the ultimate prosthetic is to obtain your own genetic code and recreate a part of your body. Because it is far more effective than any kind of prosthesis.

But while we're at it, we get to work with Craig Venter and Ham Smith.

One of the things we've been working on is trying to find ways to reprogram cells.

And if we can reprogram the cells, we can change the cells in those organs.

So if we can change the cells in these organs, perhaps we can make them more radiation resistant.

Perhaps more oxygen can be absorbed.

Perhaps it allows the body to filter out unwanted substances more efficiently.

And in recent weeks George Church has been in a lot of news because he's been talking about taking one of these programmable cells and inserting the entire human genome into that cell.

And once the entire human genome can be inserted into a cell, the question begins, would you want to enhance any of that genome?

Want to strengthen your human body?

How would you like to enhance your human body?

Where is it ethical to enhance the human body and where is it unethical?

And suddenly what we're going to do is have this multi-dimensional chessboard where we can change human genetics using viruses to attack things like AIDS, or we can change the genetic code through gene therapy to eradicate some inherited diseases, or we can change the environment to change the expression of those genes in the epigenome and pass it on to the next generation.

And suddenly it's not just one little bit, but the stack of all these little bits, until all the pieces come together to lead to something very different.

And many people are very frightened by this.

It sure sounds scary, and it comes with risks.

So why would you want to do this?

Why would we want to radically change the human body?

Part of the answer lies with British Royal Astronomer Lord Reese.

And one of his favorite sayings is that the universe is 100% malevolent.

So what does that mean?

It means that if you randomly take any part of your body and drop it somewhere in space or into space, you die.

If you drop it in the sun, it will die.

If you drop it on the surface of Mercury, you will die.

If you drop it near a supernova, it will die.

Fortunately, the effectiveness is only about 80%.

As the great physicist once said, within this rapid torrent of entropy exists a small eddy upstream of biology that creates order.

Thus, as the universe dissipates energy, there are upstream vortices that create biological order.

Now, the problem with vortices is that they tend to disappear.

they shift. they move in the river.

So when the vortex shifts, when the Earth becomes a snowball, when the Earth gets very hot, when the Earth hits an asteroid, when a supervolcano occurs, when a solar flare occurs, when a potentially extinction-level event like the next election happens (laughter), there can suddenly be periodic extinctions.

By the way, such things have happened five times on Earth, so it is very likely that the human race on Earth will one day become extinct.

It may not be next week or next month, it may be November, but it may be 10,000 years from now.

When we think about the consequences, it becomes a moral imperative to diversify our species if we believe that extinction is common, natural, normal, and regular.

And it becomes a moral imperative, as it would be very difficult to live on Mars without radically modifying the human body.

right?

Mom and Dad work together to create one cell and cascade from one cell to ten trillion cells.

I don't know if the same thing would happen to body formation if you changed gravity significantly.

We know that if we continue to expose our bodies to too much radiation, we will die.

Thinking about it, we would have to redesign things from the ground up just to go to Mars.

Forget Neptune and Jupiter's moons.

In the words of Nikolai Kardashev, think of life on a series of scales.

In other words, a Life One civilization is a civilization that begins to change its appearance.

And we've been doing it for thousands of years.

There's a stomach tuck, there's this, there's that.

I've heard that the appearance changes, but not all of the changes occur for medical reasons.

(Laughter) It seems strange.

Life-to-Civilization is another civilization.

The Life Two civilization changes fundamental aspects of the body.

So if you give it human growth hormone, it grows taller, if you give it X, it gains weight, it loses its metabolism, and all of that stuff, but it's changing function in a fundamental way.

To become an intrasolar civilization, you need to build a life-three civilization, which is very different from what we got here.

Perhaps it splices Deinococcus radiodurans to allow the cells to re-splice after extensive exposure to radiation.

You probably breathe by pumping oxygen through your blood rather than your lungs.

But you're talking about a really radical redesign. And one of the interesting things that happened in the last decade is that we discovered so many planets on Earth.

And some of them may resemble Earth.

The problem is that if we ever want to reach these planets, the fastest manned objects -- Juno, Voyager, and others -- will take tens of thousands of years to get from here to the nearest solar system.

So if you want to start exploring beaches somewhere else, or watch the sunset of two suns, you're talking about something completely different. Because it requires altering the time scale and the human body in a totally unrecognizable way.

That is Life Four Civilization.

We can't even imagine what it will be like now, but we're starting to see glimpses of equipment that could get us there.

And let me give you two examples.

This is the great Floyd Romesberg. One of the things Floyd has done is play with the basic chemistry of life.

In other words, all life on this planet is made up of the four letters of DNA, ATCG.

All bacteria, all plants, all animals, all humans, all cows, and everything else.

And what Floyd did is change two of those base pairs, ATXY.

That means there are now parallel systems for creating life, creating babies, reproducing and evolving, but it has nothing to do with most things on Earth, or perhaps anything on Earth.

Maybe we can create plants that are immune to all kinds of bacteria.

Maybe we can create plants that are immune to all viruses.

But why is it so interesting?

That means we are not a proprietary solution.

That means we can create alternative chemistries that could be adaptable chemistries to entirely different planets that could produce life and heredity.

The second experiment, or another implication of this experiment, is that, folks, all life is based on 20 amino acids.

If you don't replace two amino acids, say ATCG + XY instead of saying ATXY, 20 building blocks increase to 172, and suddenly you have 172 amino acid building blocks to build a completely different shape life form.

The second experiment to consider is a very strange experiment taking place in China.

So this guy has transplanted hundreds of rat heads.

right?

And why is it an interesting experiment?

Now consider the first heart transplant.

One of the things they used to do was bring the donor's wife or daughter and the donor would say to the doctors, "Do you know this person? Do you love this person?"

Do you have any feelings for this person? ”

I laugh about it today.

We laugh because we know the heart is a muscle, but for hundreds of thousands and millions of years, "I gave her my heart. She took my heart. She broke my heart."

We thought it was an emotion, and perhaps it was implanted with the heart. no.

But what about the brain?

There are two possible outcomes for this experiment.

If you can get a working mouse, you know your new brain is a blank slate.

Does it make any sense?

Second option: The new mouse recognizes Minnie Mouse.

The new rat remembers what it fears and how to navigate the maze. If that is true, memory and consciousness can be implanted.

And the really interesting question is, if this is portable, is this the only input/output mechanism?

Or can that consciousness be transplanted into something completely different that can remain in the universe, last for tens of thousands of years, be completely redesigned, and retain consciousness for an extended period of time?

And let's go back to the first question. why would you want to do that?

Well, let me tell you why.

Because this is the ultimate selfie.

(Laughter) This was taken from 6 billion miles away, which is Earth.

That's what we are all about.

And if that little thing disappears, the whole human race disappears.

And the reason you want to change the human body is because, ultimately, you want a picture of this being us and this being us and this being us. Because that's how humanity survives long-term extinction.

And that's why it actually turned out to be unethical not to evolve the human body, even if it's scary, even if it's hard. But it allows us to explore, live, and reach places we can't even dream of today, but our great-great-great-great-grandchildren may one day come true.

thank you very much.

(applause)

It's easy to forget that a billion people went to sleep last night without access to electricity.

1 billion people.

2.5 billion people lacked access to clean cooking and heating fuels.

These are problems for developing countries.

And it's easy for us to show no empathy for people who seem so distant from us.

But even in our world, the developed world, we see economic stagnation affecting the lives of those around us.

We see it across the economy where those involved have lost hope for the future and feel hopeless about the present.

You can see that in the EU vote.

We see that in the Sanders/Trump campaign in my country.

But even China, which has recently reached a turning point in its journey to becoming a developed nation, is witnessing the hardships Xi faces as he begins laying off many people with no future in his own coal and mining industries.

As a society, we need to consider how we move forward and manage the environmental impact of our decisions as we consider how to manage the problems of developed and developing countries.

We have been working on this issue for 25 years, since the Kyoto Protocol in Rio.

Our latest move is the Paris Convention and the resulting climate change agreement that has been ratified by countries around the world.

I think we can very much hope that these agreements, which are bottom-up agreements in which countries have expressed what they think they can do, are real for the majority of the parties and will soon come to fruition.

Unfortunately, now that an independent analysis of what these climate agreements may entail reveals the scale of the problem before us.

This is the U.S. Energy Information Administration's assessment of what will happen if countries implement the climate pledges they made in Paris between now and 2040.

Basically, it shows the amount of CO2 emissions around the world over the next 30 years.

There are three things that need to be noted and evaluated.

First, CO2 emissions are expected to continue increasing over the next 30 years.

To control the climate, we need literally zero CO2 emissions. This is because it is the accumulation of CO2 emissions that drives global heating.

This should tell us that we are losing the race to fossil fuels.

The next thing to note is that most of the growth comes from developing countries, China, India and the rest of the world including South Africa, Indonesia and Brazil. Most of these countries are transitioning their populations to a lower range lifestyle that is literally taken for granted in the developed world.

Finally, it is worth noting that about 10 gigatonnes of carbon are added to the Earth's atmosphere each year, diffusing into the oceans and land.

This is in addition to the 550 Gigatons currently installed.

By the end of 30 years, we will have put 850 gigatonnes of carbon into the atmosphere. This would probably go a long way in limiting the 2-4°C increase in global mean surface temperature, limiting ocean acidification, and limiting sea level rise.

Now, this is a projection that people have created by the behavior of society, and it is up to us to change it rather than accept it.

But we need to recognize the magnitude of the problem.

Different countries have different energy choices.

It's a function of their natural resources.

It's their climate effect.

It is due to the path of development they have followed as a society.

It depends on where they are on the Earth's surface.

Are they often dark places, or are they in mid-latitudes?

There are so many things involved in choosing a country, and each one makes a different choice.

The overwhelming point we need to assess is the choice China has made.

China has and will continue to choose to run on coal.

The US has an alternative.

The invention of hydraulic fracturing and shale gas here has made it possible to operate on natural gas.

They offer alternatives.

OECD Europe has a choice.

Germany can afford renewable energy because it can afford it.

France and the UK have shown interest in nuclear power.

Eastern Europe is still very keen on natural gas and coal, and natural gas supplied by Russia has all its entanglements.

China has far fewer options and is much harder to tackle.

If we look at China and ask ourselves why coal matters to China, we must remember what China has done.

China did not give power to the people, it gave power to the people.

No rural electrification took place.

It has become urbanized.

It has taken advantage of low-cost labor and low-cost energy to drive urbanization and create an export industry that can fund enormous growth.

If we look at China's history, we all know that China's prosperity has increased dramatically.

In 1980, 80 percent of China's population lived below the extreme poverty level, the level of having $1.90 per person per day.

By 2000, only 20 percent of China's population lived below the extreme poverty level. This is clearly an astonishing achievement, albeit at a cost of civil liberties unacceptable in the West.

However, the influence of that wealth has enabled people to obtain significantly better nutrition.

This made it possible to install water pipes.

This allowed the installation of sewage pipes at the expense of some outdoor air pollution and dramatically reduced diarrheal diseases.

But in the 1980s, and still today, indoor air pollution is China's biggest culprit. This is because people do not have access to clean cooking and heating fuels.

In fact, it is still estimated that by 2040, 200 million people in China will lack access to clean cooking fuels.

A great road awaits them.

India also needs to meet the needs of its own people, and it is trying to do so by burning coal.

EIA projections for coal burning in India show that India will provide almost four times more energy from coal than from renewables.

It's not because they don't know the alternatives. Because rich countries can do what they choose and poor countries do what they have to do.

So how do we stop coal emissions in time?

What can be done to change this forecast before us?

Because it is a prediction that can be changed if there is a will.

First of all, we have to think about the size of the problem.

Between now and 2040, 800 to 1,600 new coal-fired power plants will be built around the world.

This week, one to three 1-gigawatt coal-fired power plants are in operation around the world.

It's happening regardless of what we want. Because those who govern their countries valued the interests of the people and decided that it was in the interests of the people to do so.

And it will happen unless there is a better alternative.

And every 100 of those plants use up between 1 and 3 percent of the planet's climate change budget.

So every day when you go home feeling like you have to do something about global warming, remember that at the end of the week someone set fire to a coal plant that was supposed to run for 50 years and took away your ability to change it.

What we forget is that Indian ethnic but American venture capitalist Vinod Khosla used to talk.

And he said in the early 2000s that if China and India were to move away from fossil fuels, they would need to develop technology to pass the "Chindia test," and "Chindia" was a combination of the two words.

It has to be viable first of all. This means that it can technically be implemented in your country and accepted by the people there.

Second, it must be a scalable technology that can deliver the same benefits on the same schedule as fossil fuels, so that we can once again live the life we ​​take for granted.

And third, it had to be cost effective without subsidies or obligations.

It had to stand on its own two legs. In fact, if those countries had to beg or have some foreign country say, 'We won't trade with you' to make the technology transition happen, we wouldn't be able to keep that many people.

Looking at the Chindia test, we just haven't found an alternative that meets that test yet.

That's what the EIA forecast tells us.

China is building 800 GW of coal, 400 GW of hydropower, about 200 GW of nuclear power, and about 100 GW of renewable energy on an intermittently adjusted energy equivalent basis.

800 gigawatts of coal.

They understand the costs better than any other country, they understand the needs better than any other country and they do it.

But that's what they're aiming for in 2040, unless we give them better options.

To give them better options, they must meet the Chindia test.

If you look at all the alternatives out there, there are two that come close.

The first is about this new nuclear field. More on this later.

This is a new generation of nuclear power plants being planned around the world, and those in development say they could be ready for demonstrations by 2025 and scale-up by 2030, if they'll let us.

A second alternative that may come in time is utility-scale solar power using currently available natural gas, not batteries under development.

So what is holding back new nuclear development?

Outdated regulations and yesterday's thinking.

We have not used the latest scientific thinking about radiation health to think about how to communicate with the public and how to manage the experiment of new nuclear reactors.

We have new scientific knowledge that needs to be used to improve how the nuclear industry is regulated.

Second, there is the idea that it will take 25 years and $2-5 billion to develop a nuclear power plant.

It comes from the historical and military thinking of where nuclear energy was born.

These new nuclear ventures say they can deliver power at 5 cents per kilowatt hour. We can supply 100 gigawatts per year. They could demo it by 2025. If only we gave them a chance, they could do it at scale by 2030.

For now, we are waiting for a miracle.

We need choice.

If you can't make it safe, if you can't make it cheap, you shouldn't deploy it.

But what I want you to do is write to your leaders and the heads of the NGOs you support and tell them to give them a choice, not the past, instead of pushing the idea forward.

thank you very much.

(applause)

Mia Birdsong: Why is Black Lives Matter so important to the US and the world right now?

Patrice Cullors: Black Lives Matter is our call to action.

It is a tool for reimagining a world in which black people are free to exist and live freely.

It is a tool for our allies to present themselves differently to us.

I grew up in an area with a heavy police force.

I have witnessed my siblings and siblings being stopped and threatened by law enforcement.

I remember my house being raided.

One of my childhood questions was, "Why?"

why us

Black Lives Matter provides the answer to why.

This provides a new vision for young black girls around the world, and we deserve to fight for it and call on local governments to join us on our behalf.

Opal Tometi: And anti-black racism -- (applause) And anti-black racism isn't just happening in the United States.

It's actually happening all over the world.

And now, more than ever, we need a human rights movement that challenges systemic racism in all circumstances.

(Applause.) We need this because of the global reality that black people are exposed to all sorts of inequalities in most of the toughest issues of our time.

I think about issues like climate change and how 6 out of 10 countries most affected by climate change are actually on the African continent.

People are shaken by all sorts of unnatural disasters, displaced from their ancestral homes and without the opportunity to earn a decent living.

Many countries have recently wreaked havoc, but Haiti has been the most devastating. We have also seen disasters like Hurricane Matthew.

Haiti is the poorest country in the hemisphere and has a black population.

And what we're seeing in Haiti is that they're really facing a lot of challenges even before this hurricane.

They were shaken by the earthquake and by the still uneradicated cholera brought in by the UN peacekeepers.

This is unconscionable.

And if we didn't have a black population in this country none of this would have happened and we have to think about it seriously.

But what is most encouraging now is that despite these challenges, what we are seeing is that there is a network of Africans across the continent who are standing up to fight back and demand climate justice.

(Applause.) MB: Alicia, you said that when black people are free, everyone is free.

Can you tell me what that means?

Alicia Garza: Absolutely.

So race and racism are probably the most studied social, economic and political phenomena in this country, but also the least understood.

The reality is that the races of the United States range from blacks to whites.

This doesn't mean that people in between won't experience racism, but it does mean that the closer they are to being white on that spectrum, the better off they are.

And the closer you get to being a black person on that spectrum, the worse your situation gets.

When considering how to deal with the problems of this country, we often start with a trickle-down of justice.

So we use the white man as a contrast and say, "If it makes things better for the white man, everyone else will be free."

But in practice it doesn't work that way.

We have to deal with the underlying problem. Dealing with what's going on in the black community creates a frenzy, right?

In other words, bubble up instead of trickle down.

Let's take an example.

When talking about the pay gap, it's often said that women earn 78 cents for every dollar men earn.

You've probably heard it before.

But these are statistics for white women and white men.

In reality, white women earn 78 cents, while black women earn about 64 cents.

Talking about Latino women, it goes down to about 58 cents.

If you talk about indigenous women, if you talk about trans women, go further down.

Again, everyone has a chance to reap the benefits if you deal with the most affected people rather than dealing with the less affected people and hoping it will trickle down.

MB: That's why I love bubbly lather.

(laughs) MB: Who doesn't like a glass of champagne?

(laughter) Guys, what more could you want?

You've been doing this for a while, but the last few years, well, I can't even imagine, have been very transformative.

And I'm sure you've learned a lot about leadership.

What would you like to share with these people about what you learned about leadership?

Patrice, let's start with you.

That's what I've learned the most in the last few years.

(Applause.) What we've seen is thousands of black people showing up for our lives with little infrastructure and little support.

I think our job as leaders of the movement is not just our own visibility, but how we visualize the whole.

How do we not just fight for individuals, but fight for everyone?

And I also think leadership looks like everyone in this audience is showing up for black lives.

You don't just come on stage and watch people, do you?

It's how you become a leader, whether at work or at home, and whether you believe that the Black Lives Movement is not just for us, it's for everyone.

(Applause) MB: How about you, Opal?

OT: So I've learned a lot about interdependence.

I am learning how to trust my team.

I came up with this new mantra after returning from a three month sabbatical. Unusually for a Black woman in leadership, not only stepping in at times, but also stepping back and practicing felt very important to my leadership and the team.

What I've learned in this process is that we need to recognize that different people contribute different strengths, and that for the team as a whole to thrive, we need to let them share and shine.

So while I was on vacation at an organization that I also work with, I saw the team rise while I was away.

They launched a new program and were able to raise funds.

And when I came back I had to give them lots of thanks and praise. Because they showed me that they really had my back and that they really had their back.

As you know, during the course of this sabbatical, I was really reminded of this Southern African Ubuntu philosophy.

I exist because you exist. You are here because I am here.

And I realized that my own leadership and the contributions I could make were largely due to their contributions.

And I have to admit it, and I have to see it, and my new mantra is "Keep calm and trust your team."

And "Keep calm and thank your team."

MB: You see, one of the things I feel I've heard more than anywhere else in the context of the Black Lives Matter movement is about being a leadership movement. It's such a beautiful concept. I think what women often bring to conversations about leadership is actually the collective part.

Alicia, how are you?

AG: Well...

How many of you have heard the phrase "leadership is lonely"?

I think there is an element of loneliness in being a leader, but I think it doesn't have to be.

And to get to that point, I think we have some work to do.

So one thing is that we have to stop treating our leaders like superheroes.

We are normal people trying to do extraordinary things, so we need to be supported as such.

Another thing I learned about leadership is that there is a difference between leadership and celebrity, right?

And we seem to have turned into some kind of celebrity instead of someone trying to solve the problem.

And the way we treat celebrities is so capricious, right?

One day you like them, the next you don't like what they're wearing, and all of a sudden you have a problem.

Therefore, we must stop deifying leaders so that more people can lead.

Many people are afraid to take up leadership because of how intensely they are under scrutiny and how brutal we are to our leaders.

And the last thing I learned about leadership is that it's very easy to be a leader if everyone likes you.

But it's hard to be a leader when you have to make hard choices, when you have to do the right thing even if people don't like you.

In that sense, I think another way we can support our leaders is by fighting alongside us, but not personally, but politically.

Even if we don't agree, we can still have disagreements, but it's important to point each other out so that everyone can stand up for themselves.

MB: Great, thank you.

(Applause.) You're in a job that forces you to face cruel and painful realities every day.

What is it that gives you hope and inspires you?

PC: I'm looking forward to black futures.

I say that because we live in a society obsessed with black death.

We have images of our own death on our TV screens, Twitter timelines, and Facebook timelines, but what if we imagined a black life instead?

We imagine black people living and thriving.

And that inspires me.

OT: Immigration is what inspires me these days.

Migrants around the world doing their best to make a living, survive and thrive.

More than 244 million people do not currently live in their home country.

This is a 40% increase since 2000.

What this shows is that inequality around the world is getting worse.

But there are those who find the strength and resources to travel, move, find better lives, and provide for their families and loved ones.

And some of these immigrants are illegal immigrants.

they are unlicensed.

And they inspire me even more. Because our society tells them, you are not wanted, you are not needed here, and many of them are beginning to organize in their communities, even though they are very vulnerable and subject to attacks of abuse, wage theft, exploitation and xenophobia.

And what I'm seeing is the emergence of undocumented black networks that are also resisting this framework and resisting the criminalization of their existence.

And it's incredibly powerful to me and inspires me every day.

MB: Thank you.

Alicia?

AG: I know young people are the present and the future, but what inspires me is the older people who are contributing to this movement and are changing.

We all know that as we age, our ways of doing things harden a little bit.

It's happening to me, I know it's right.

But when I see people doing things their way and having their own way of thinking about the world, it inspires me a lot. They have the courage to listen to the experiences of many who want to live in a just world.

And I am also inspired by seeing the actions older people are taking for this movement.

I am inspired to see older people demonstrate their power and leadership and say, "I'm not handing the torch, I'm helping to light the fire."

(Applause) MB: I love it -- yes.

So in terms of action, I think it's great to be able to sit here and listen and be open and change, but that doesn't set black people free.

So, if there's one thing you really want this audience and the people watching around the world to do, what is it?

AG: Okay, easily two.

One is to call the White House.

Water people are being forced out of the camps they set up to save our lives.

And it is intricately related to black lives.

So be sure to call the White House and demand that such behavior be stopped.

Tanks and police officers are arresting everyone there as we speak.

(Applause.) The next thing you can do is participate in something.

Be part of something.

There are groups and collectives that don't have to be non-profit, you know what I mean?

But there are groups in our community right now working to make sure that black lives matter—that all lives matter.

Please join us. Don't sit on the couch and tell people what you think you should do.

Why don't you try it with us?

MB: Is there anything else you would like to add?

that's good? have understood. I mean, I think participating in something means that if you feel something is missing where you are, you should start doing it.

AG: Let's get started.

MB: Any conversation we have is a conversation with someone else.

And instead of just letting it go, decide to actually start doing something.

OT: That's right.

MB: So that's what you guys did.

Thank you very much for joining us today.

OT: Thank you.

(applause)

Tiq Milan: Our first conversation was on Facebook and it lasted three days.

(Laughter.) We shared over 3,000 messages and during those 72 hours I was convinced she was going to be my wife.

We never waited the required amount of time for courtship. We told each other the dangerous truth upfront. I am a transgender male. That is, the F in the birth certificate should have stood for "fake" instead of "female".

(laughs) Walking in the world as a woman felt like walking with a pebble in your shoe.

It took my stride out of rhythm, knocked me off balance, and made every step painful.

But today I am a man of my own will. The man I designed myself.

Kim Katrin Millan: I am a cisgender queer woman.

Cisgender means that the gender assigned at birth is and always will be female.

This doesn't make me natural or normal. This is just one way of describing the different ways we exist in this world.

And queer is a cultural term, but in this case it refers to not being bound by gender when choosing a partner.

I have identified myself in several different ways, including bisexual and lesbian, but for me queerness encompasses all layers of who I am and how I have loved.

I'm strata, not fractions.

And for me, the fact that he's queer meant I could trust his courtship from the start.

As queer and trans people, we are often excluded from institutions and traditions.

We create space outside of conventions, including those of time.

And in the 3,000 messages exchanged between us, our time collapsed. We found it strange. We put it all on the table.

(laughs) Don't show off at all.

This meant that we could commit to each other in a completely different way than we have ever been.

We are often told about the "golden rule" idea that we should treat others as we would like to be treated.

But the problem with this is that while we assume it's the norm for others, it's not for us.

We need to treat others the way we would like them to be treated. So we had to ask.

It was inconceivable that the kind of love Tik needed was the same kind of love I needed.

So I asked him everything - about his fears and anxieties - and we started from there.

TM: I didn't know what kind of love I needed.

I had just emerged from a year-long fog of rejection and complete debilitation.

Someone looked me in the eye and told me I wasn't worthy of being loved because I was transgender.

And then there's the loveless culture we've built around transgender people.

It is reasoned, justified and often signed into law.

And I was close to internalizing the message that I was worthless.

But Kim said I was her ideal: me in heartbreak and confusion.

(laughs) KKM: He was my ideal.

(Laughter) In many ways.

As poets, writers, and creators, we had a long history of community work behind us and big, big dreams for our family in front of us. We shared a lot in common but were incredibly different.

I am a lifelong traveler and somewhat orphaned, but he comes from a large family and is definitely down to earth.

I often say the difference between each other's strengths. "Keep me safe and I'll keep you wild."

(laughs) TM: We have an alienated identity, but we don't live an alienated life.

Being queer and trans is about creating a new way of being.

It's about loving people for who they are, not what they should be.

In a world that is often cruel and violent towards proud and overly liberal women, Kim is unapologetically feminine.

And I didn't enter this union under the auspices of her being my helper or my rib, I had a complete complex -- (laughter) KKM: Right? It is different.

TM: But a completely complex human being whose femininity was not something I could hold back, control or criticize.

It's her brightness, the way she leads with compassion, and the way she never loses empathy.

She's been my hero since day one.

(Applause) KKM: Our relationship has always been about setting each other free.

One of the first questions I asked him was what his dream was to achieve and how I could help him get there.

His dreams are to live as a poet, to adopt and raise a family, to live a life he is proud of, and to live up to his mother's incredible legacy.

And I'm really grateful that we started from that place, rather than thinking about how we can cooperate with each other.

And I think this has allowed us to grow into incredibly different people.

i love him dearly Before migration, now and in the future.

And it's this love that made us commit to each other before we even saw each other's faces.

TM: My mother's biggest concern when I transitioned was who would love me for who I am.

Was being trans somehow a hindrance to love or monogamy because I was probably born into the wrong body?

But this kind of structure needs to be rebuilt in order to bring in love.

My body never let me down and my body never did anything wrong.

It is this restrictive, dualistic idea of ​​gender that I have decided not to exist.

But when we met, she loved me just the way I appeared.

She traced her finger along the numb keloid scar left from my upper surgery.

A scar that extends from the middle of the chest to the outside of the torso.

She said that these are reminders of my strength and all that I have been through, and that there is nothing for me to be ashamed of.

So sprinting towards her hand in marriage was the weirdest thing I could do.

(Laughter.) It flew in the face of the conventional trajectory of love and relationships. Because God should never have blessed the marriage of people like us, nor should the law approve it.

KKM: So, on May 5, 2014, just about three months after meeting online, we got married on the steps of City Hall in Manhattan. It was beautiful in every conceivable way.

It's fair to say that we've reimagined some traditions, but we've also left some of the older traditions we've been working on and created something that works for us.

My bouquet and corsage were actually full of Brooklyn wildflowers. I also added a little lavender and sage to calm us down when we were nervous.

It was assembled by our friend's kind sister healer.

Conflicts and conventions are not my taste, so I didn't want a diamond ring. As such, my ring is the deepest purple, similar to the color of my crown chakra, and is set with my birthstone.

The gift of queerness is a choice.

I never had to choose his last name, and it was never the exception, but I chose it because I am my father's illegitimate child and someone who has always been apologetic, secretive, and forced.

And it was incredibly free to choose the name of the man who chose me in the first place.

(Applause.) TM: So we told our family and close friends about it, and many of them still didn't believe when we made our vows.

Fittingly, we posted all of our wedding photos on Facebook, where we met, and of course, Instagram.

And I quickly realized that our union was not just the union of two people, but a model of possibility for millions of LGBTQ people who have been sold the lie that family and marriage are antithetical to us, for those of us who rarely see ourselves reflected in love and happiness.

KKM: And the problem is that we are alienated because of our identity, but at the same time it gives us the courage to be who we are.

Queerness is our main key. Blackness is our magic.

They make us hopeful, open, receptive and transformative.

These are the sources of our strength and incredible strength.

Our queerness is the source of that strength.

I am reminded of the words of Ottawa-based poet Brandon Wint. "It's not queer like gay, it's queer who escapes definition.

A queer with a kind of fluidity and infinity at the same time.

Queer like freedom too weird to conquer.

The fearless kind of queer who imagines what love is like and pursues it. ”

TM: We're part of a community of people -- yeah, that's a good thing, right?

(Laughter) We are part of a community of people, regardless of gender, living their true selves despite the ubiquitous threat of violence, despite the ever-present undercurrent fears of people living their own way.

Globally, a transgender person is murdered every 21 hours.

And the United States has recorded more trans murders this year than in any previous year.

But our story goes far beyond the rigid dichotomy of strength and resilience.

We are magnifying human complexity at these rims and creating freedom at these rims.

KKM: And there are no blueprints.

We are literally creating a world that has never been seen before. We organize our families on love, not blood, and guide them by compassion few have shown ourselves.

Many of us have not received the love of our families and have been betrayed by those we trusted the most.

So what we do here is create a whole new language of love.

It's about creating a space where we can be who we are, not imposing standards of what masculinity and femininity should be.

TM: We are interested in love and inclusion as tools of revolutionary change, right?

The idea is simple. If we let go of all preconceived notions about what a person should be like, body, gender, skin, etc., and take deliberate steps to release these deep-seated prejudices and create a space for people to self-determine and accept themselves for who they are, we will undoubtedly create a better world than the one we were born into.

(Applause) KKM: We want to mark this time in history by leaving evidence of the fact that we were here.

We open a small window in our relationship for the community to testify. We do this because we want to create a map for the future, not a memorial for ourselves.

Our experience does not invalidate other people's, but it should and inevitably complicates this idea of ​​what love and marriage should be like.

TM: OK, so far we've been talking, inspiring, modeling possibilities, but it's far from perfect.

And we had to turn the mirror on ourselves.

And I realized that I wasn't always the best listener and that my ego got in the way of our progress as a couple.

And I really needed to appreciate these deep-rooted sexist ideas I had about the value of women's experiences in the world.

I had to reassess what it meant to be allied with my wife.

KKM: And I had to remind myself a lot.

What does it mean to be tough on problems but kind to people?

While writing this, we got into a big fight.

(Laughter) For a variety of reasons, based on our values ​​and lived experience content, we were really hurt, you know?

Because what we do and how we love is putting ourselves at risk.

But even though the fight lasted two days, (laughs) we were able to get back together and recommit ourselves, to each other, and to our marriage.

And that has produced some of the most passionate parts of what we share here with you today.

TM: I had to question masculinity, but I don't think it's enough.

I had to question my masculinity. The toxic privilege that comes with being a man doesn't define me, but I have to take responsibility for how it manifests in my daily life.

I've let my wife do all the emotional labor of prying open communication lines when I want to shut up and run away.

(Laughter.) I robbed myself of emotional support instead of facing my own weakness, especially before and after the heartbreaking miscarriage I had last year. I am sorry for that.

As men, we sometimes take the easy road.

So my journey as a transgender is one of rethinking masculinity.

About creating masculinity as something that works alongside femininity and is guided by my spirit, rather than being measured by the power it wields, the rights it's conferred, or the mimicry of control it gathers.

Ministry of Health: Ladies and Gentlemen...

(Applause.) And this created a space for my femininity to blossom in a way I had never experienced before.

He is never intimidated by my sexuality, nor does he police what I wear or how I act.

I cook, but he cleans much better than I do.

And when we leave the house in a hurry and have a lot to handle, he takes care of everything so I have time to do my hair and makeup.

(Laughter) He understands that this is my armor, and he never treats femininity as something frivolous or superficial. This and him help me grow my experience with gender every day.

TM: I love watching her get dressed in the morning.

Watching her in her closet looking for something comfy, colorful, tight and safe -- (Laughter) but it's hard to see her negotiating decisions looking for the least attention-grabbing but at the same time representing her vibrant, sexy woman.

And all I want to do is celebrate her beauty and what makes her beautiful, special and free, from her long acrylic nails to her uncompromising black feminism.

(Applause) KKM: I love you. TM: I love you.

(laughs) KKM: There are many queer and transgender people before us, but we never listen to them.

We are constantly experiencing a retelling of history in which we are significantly left out.

And it's really hard not to see yourself there.

And living out loud for us is about that expression.

It is to have a model of possibility and hope that love is part of our heritage in this world as well.

TM: The possibilities we are doing are reinventing time, love and institutions.

We are creating a future of diversity.

We are expanding the scope of gender and sexuality, imagining ourselves to exist, imagining a world where gender is self-determined and unenforced, imagining a world that is a kaleidoscope of narrow-minded possibilities masquerading as science and justice.

(Applause) KKM: I can't lie. It's really, really hard.

It's hard to face prejudice with an open mind and a smile.

It's really hard to stand up to the injustices that exist in the world while believing that humans really have the power to change.

It requires a great deal of faith and dedication.

And more than that, marriage is hard work.

(Laughter) A pile of dirty socks on the floor, a sports show that's more boring than you can imagine -- (Laughter) And a fight that makes you cry because you don't speak the same language.

But not a day goes by that I am not grateful that I was able to marry this person. There, I am less appreciative of the possibility of changing thoughts, adding value to conversations, and creating a world where love belongs to all of us.

Consider our acronym LGBTQ2SIA.

It seems like an endless evolution of yourself and your community, but it's also a really deep desire to leave no one behind.

We have learned how to love each other and have dedicated ourselves to loving each other through gender transitions and mental shifts.

And we learned this love in chat rooms, clubs, bars and community centers.

We learned how to love each other over the long term.

TM and KKM: Thank you.

(applause)

This photo is from a Metrocard when I spent a year studying abroad in Paris during college in the mid-90s.

My friends say I look like a French anarchist -- (laughter) but this is still what I see when I look in the mirror in the morning.

Within a month of living in Paris, I had lost 15 pounds, was eating fresh food, walking everywhere, and was in the best shape of my life.

Growing up in a suburb of Atlanta, an area built largely by highways and automobiles and reputed to be a symbol of sprawl, Paris fundamentally changed the way I understood the structure of the world around me, and I became obsessed with the role of infrastructure. Not only does it move people from point A to point B, it carries water, wastewater and energy, it is the foundation of our economy.

It is the foundation of our social life and culture and is very important to our way of life.

When I got home, I quickly got annoyed and got stuck in traffic as I passed the top of the outer highway.

Not only did my muscles not move, but I also had no social interaction with the hundreds of thousands of people who, like me, had their eyes forward and their music blaring past me.

I wondered if this was an inevitable outcome or if there was something I could do.

Is it possible to turn this situation in Atlanta into the kind of place I want to live in?

I returned to graduate school in architecture and urban planning to develop my interest in infrastructure and came up with the idea for my graduation project in 1999. It was about adapting an old, decommissioned railroad loop that circles downtown as a new infrastructure for urban regeneration.

it was just an idea.

I never thought I would actually build one.

But I ended up working for an architecture firm, and when I finally told my colleagues about it, they liked the idea.

And the more we started talking about it, the more people wanted to hear about it.

In the summer of 2001, we connected with Cathy Woolard, who was soon elected Speaker of the City Council.

And we built a vision for the entire city around this idea. It's the 32-mile circular Atlanta Beltline of transportation, trails, and transformation.

I had three meetings, two times a week, for two and a half years. So did Cathy and her staff, as well as a few volunteers.

Together we built this movement of amazing people and ideas.

Among them were community defenders who were used to fighting things but found the Atlanta Beltline as something they could fight for themselves. Developers saw an opportunity to capitalize on the city's many new growths. and dozens of non-profit partners who saw their mission at least partially accomplished by a shared vision.

Now, usually these groups of people are at the same table and don't want the same results.

But we were there and it was a little weird but really, really powerful.

The people of Atlanta fell in love with a vision better than what they saw through the windshield of their car, and they made it happen. Otherwise we swear we didn't build it.

From the beginning, our coalition has been diverse.

People from all walks of life were part of our story.

Financially poor people also loved it.

They were just afraid they wouldn't be able to go there when it was built and that the price would go up.

And we've all heard stories like that before, right?

But we promised the Atlanta Beltline would be different, and people bought into the idea and built it into something better than we could have imagined: homes, new parks, art, and massive subsidies for arboretum. That list continues to grow.

We have also put in place the organizations and institutions necessary to achieve this.

And the important thing is that.

It is currently in the early stages of implementation and is working well.

The trail's first main section opened in 2012 and has already generated more than $3 billion in private investment.

But it's not just changing the physical shape of cities, it's changing the way we think about cities and our expectations of living in them.

About a month ago I had to take my kids to the supermarket and they were complaining because they didn't want to get in the car.

They said, "Dad, if I have to go, can I at least ride my bicycle?"

And I said, 'Of course I can.

That's what people in Atlanta do.

We ride our bikes to the grocery store. ”

(Laughter) (Applause) Thank you, yes.

Well, they don't know how ridiculous it is, but I know.

And I also understand that their expectations of Atlanta are really high.

This kind of transformation is very much like the sprawl of the last century, when investments in highways and automobiles radically changed American life.

It wasn't a grand plot.

Of course, there was a conspiracy in it.

But it was a cultural momentum.

Millions of decisions made by millions of people over a long period of time have fundamentally changed not only the way cities are built, but also the way we live our lives.

These changes laid the foundation for urban sprawl.

We didn't call it sprawl at the time.

We called it the future.

And so it was.

And we got all the highways, strip malls and cul-de-sacs we wanted.

It was a radical transformation, but built on cultural momentum.

Therefore, it is important not to disconnect the physical structure of where we live from other events happening at the time.

Then, in the second half of the last century, science cured disease and lifted us to the moon, the sexual revolution broke down barriers, and the civil rights movement began marching toward fulfilling the nation's promises.

Television, entertainment, food, travel, business were all changing, with both the public and private sectors colluding to give us the life we ​​wanted.

For example, the Federal Highway Administration didn't exist before highways.

please think about it.

(Laughter.) Of course, today it's important to understand and acknowledge that those benefits go to some people and not others.

It wasn't a fair cultural momentum.

But as we gaze in amazement and disgust at the metropolis that stretches out before us today, one might wonder if we are stuck.

Are we stuck in that legacy of inequality?

Are we stuck in this dystopian traffic hell?

Are we stuck in rampant forced migration and environmental degradation in urban areas?

Are we falling into social isolation or political polarization?

Are these inevitable and permanent consequences?

Or are they the result of collective cultural decisions we make ourselves?

If so, can't it be changed?

What I learned from my experience in Atlanta is not unusual.

Similar stories are playing out everywhere, with people reclaiming not only old railroads, but also dilapidated urban waterways and outdated roads, reinventing all the infrastructure of life.

Whether here in New York, Houston, Miami, Detroit, Philadelphia, Seoul, Hong Kong, Singapore, Toronto, Paris, cities large and small around the world are reclaiming and reinventing this infrastructure themselves. That includes the Los Angeles River, the mother of all catalytic infrastructure projects. Similarly, revitalization efforts that began as grassroots movements have developed into cultural momentum and are now in the early stages of being reborn as a sort of life-affirming infrastructure. Parks, fishing, boating, community revitalization and of course water quality and flood control.

People's lives are already improving.

It's already starting to change the way we think about Los Angeles.

This is more than just infrastructure.

We are building a new life for ourselves.

This is a movement that includes local food, urban farming, craft beer, the maker movement, technology and design, all of which are early signs of a truly radical change in the way we build our cities.

We are transforming places like this like this.

And soon this.

And all this is exciting and good.

We are changing the world for the better.

Good for us!

And that's great - ie.

But from our history of sprawl, and what we're already seeing with these catalyst projects today, we know and need to remember that big changes like this usually don't benefit everyone.

The market forces unleashed by this cultural impetus often include seemingly unstoppable and inevitable cycles of rising taxes, prices and rents.

This is urgent.

If we care, we have to stand up and speak up.

This should be a call to action, because not improving the community is never the answer.

The answer is not to build parks, transportation, and grocery stores.

The answer is not to hold back communities just to keep prices affordable.

But we have to follow through and deal with the economic realities we face.

This is difficult and does not come naturally.

We can do it, and I am dedicated to achieving this goal in Atlanta and working again for the people who made it possible in the first place.

I wouldn't be successful without them.

The people I've been promising to over the years weren't an abstract group, so I could never do that.

They are my friends and neighbors.

they are the people i love.

So this started as my senior thesis, and I've worked hard for 16 years with thousands of people to make this happen, but I know and believe that who the Beltline is built for is as important as whether it's built in the first place.

Not only in Atlanta, but locally and globally, we need to understand this accountability to those whose lives we are changing. Because this is who we are.

We are talking about life itself.

These places are not inevitable.

Where we live is not inevitable. If you want something different, you just need to speak up.

We must allow change to materialize on our terms.

To do that, we need to be active participants in the process of shaping change.

thank you.

(applause)

In 1987, Tina Lord found herself in quite a predicament.

See, this gold digger confirmed that she married sweet Kord Roberts right before he inherited his multi-million dollar fortune.

But when Cord found out that Tina loved his money as much as she loved him, he dumped her.

Cord's mother Maria was thrilled until the two were reunited.

So Maria hires Max Holden to romance Tina so that Kord doesn't know that Tina is pregnant with his child.

So Tina, still married, flew to Argentina with Max, thinking that Cord didn't love her.

Kord finally realized what was happening and rushed after them, but it was too late.

Tina had already been kidnapped, tied to a raft, and sent over a waterfall.

She and the baby were presumed dead.

Kord was a little sad, but soon got over himself with a super talented archaeologist named Kate and had a lavish wedding, but Tina rushed into the church holding her baby as if she had risen from the dead.

"Stop!" she cried.

"Is it too late?

Cord, you've come this far.

this is your son ”

Ladies and gentlemen, this is how the soap opera One Life to Live presented a love story that lasted 25 years.

(Laughter) Now, if you've ever seen a soap opera, you know that the stories and characters are more exaggerated than they really are. And if you're a fan, you'll find the exaggeration amusing; if you're not, you might find it melodramatic and unsophisticated.

Maybe you think that watching soap operas is a waste of time. Large melodramas mean small or non-existent lessons.

However, I believe the opposite is true.

Melodrama is a bigger reflection of life.

So there are real-life lessons we can learn from soap operas, and those lessons are as big and adventurous as any soap opera storyline.

Well, I've been a fan ever since I was a second grader and ran home from the bus stop desperately to see the end of Luke and Laura's wedding, the biggest moment in "General Hospital" history.

(Applause.) So you can imagine how much I loved my eight years as an assistant casting director on How the World Would Change.

My job was to watch soap operas, read soap opera scripts, and audition for actors to appear in soap operas.

So I know myself

(Laughter) And yes, soap operas are larger than life dramas on an epic scale, but our lives can be just as intense, and the stakes can feel just as dramatic.

We cycle through tragedy and joy just like these characters.

We cross thresholds, fight demons and find unexpected salvation. You repeat it over and over again, but you can flip the script just like soap. So you can learn from these characters who move like bumblebees, looping and turning their lives.

And we can use those lessons to craft our own life stories.

Melodrama teaches us to push aside doubt and believe in our own capacity for courage, vulnerability, adaptability and resilience.

And most importantly, they show us that it's never too late to change your story.

Let's start with Melodrama Lesson 1. Surrender is not an option.

(Laughter) Erica Kane in "All My Children" was a daytime version of Scarlett O'Hara, the exaggerated self-important princess who was crude and bold at heart.

Now, in her 41 years of television appearances, perhaps Erica's most famous scene is the one in which she suddenly faces a grizzly bear alone in the woods.

She shouted at the bear, "Don't do that!"

do you understand me?

You may not come near me!

I'm Erica Kane and you're a dirty beast! ”

(Laughter) And of course the bear has walked away, which tells us that obstacles are to be expected and that we can choose to surrender or stand up and fight.

Pandora's Tim Westergren knows this better than anyone.

You could call him the Erica Kane of Silicon Valley.

Tim and co-founders raised $2 million to launch the company.

The next year, I ran out of cash.

Many companies now pull out at that point, but Tim chose to fight.

He maxed out 11 credit cards and hit six figures in personal debt, but it wasn't enough.

So, for two years, every two weeks on payday, he stood before his employees and asked them to sacrifice their salaries, and it worked.

More than 50 people deferred payments of $2 million, but after more than a decade, Pandora is worth billions of dollars.

You can overcome enormous obstacles when you believe that whatever is in front of you has a way around or over it and surrender is not an option.

Now move on to Lesson 2 of Melodrama. It's about sacrificing your ego and letting go of your sense of superiority.

Okay, this is scary.

It is an acknowledgment of need and possibility of error.

Maybe it's an acknowledgment that it's not as special as we think it is.

'The Bold and the Beautiful' Stephanie Forrester thought she was pretty special.

She thought she was so special that she didn't need to mingle with the Valley Tramps, so she let Valley Girl Brooke know about it.

But after nearly 25 years of fierce fighting, Stephanie fell ill and let Brooke into the house.

They made amends, their nemesis became soulmates, and Stephanie died in Brooke's arms. Here is our lesson.

Drop your ego.

life is not yours.

It's about us, and our ability to experience joy, love, and improve our reality comes only when, like Starbucks CEO Howard Schultz, we make ourselves vulnerable and accept responsibility for our actions and inactions.

Now Howard stepped down in 2000 after a stellar performance as CEO, and Starbucks expanded too quickly, sending its stock price down.

Howard returned to the team in 2008 and one of the first things he did was apologize to all 180,000 employees.

he apologized.

And in return, I asked for help, honesty and ideas.

And now, Starbucks' net revenue has more than doubled since Howard's return.

So sacrifice your desire to be right and safe all the time.

It doesn't help anyone, especially you.

Sacrifice your ego.

Soap Drama Lesson 3: Evolution is Real.

You are not meant to be a static character.

In television, static equals boredom, and boredom equals dismissal.

Characters grow and change.

Now, in television, these dynamic changes can result in rough transitions, especially for characters played by one person yesterday and a new person today.

Recasting always happens in soaps.

Over the past two decades, four different actors have played the same pivotal role of Carly Benson in General Hospital.

Every time a new face appears, there is a change in the character's life and personality.

Well, there was always an important element of Carly there, but the character and story adapted to whoever played her.

And what this means for us.

We may not be able to swap faces in life, but we can also evolve.

We can choose to circle around our feet and stay in place, or we can open ourselves up to opportunities like nursing student-turned-hotel-owner Carly and Julia Child.

Julia was a World War II spy who married when the war ended, moved to France, and decided to enroll in culinary school.

Julia, her books and TV shows have revolutionized the way America cooks.

We all have the power to change, evolve and adapt to our lives.

We are the ones who make choices, but sometimes life gives us choices that we may not pay attention to.

Surprise hit us in the face.

Falling to the ground, running out of air, requiring resuscitation.

So thanks for soap opera lesson 4. Resurrection is possible.

(Laughter) (Applause) In 1983, Stefano DiMera of "Days of Our Lives" died of a stroke, but it really wasn't. Because he died in 1984 when his car crashed into a harbor, but he came back in 1985 with a brain tumor.

(Laughter.) But before the tumor could kill him, Marlena shot him and he fell off the catwalk to his death.

And it lasted for 30 years.

(Laughs) I could understand it well when I saw the corpse.

There's a reason he's called Phoenix.

And what this means for us.

Nothing is permanent as long as the show is still on the air or you are still breathing.

Resurrection is possible.

Of course, like life, soap operas eventually come to a denouement.

CBS canceled my show "As The World Turns" in December 2009 and we shot the final episode in June 2010.

Six months after my death, I took that train straight into the mountains.

And even though we were in the middle of the Great Recession and millions of people were struggling to find work, I somehow thought everything would be fine.

So I packed up my kids and an apartment in Brooklyn and moved in with my in-laws in Alabama.

(Laughter) Three months later, nothing was wrong.

That's when I saw the final episode broadcast and realized that the show wasn't the only fatal accident.

I was one of them.

I was unemployed and lived on the second floor of my parents-in-law's house, and that alone was enough to make anyone feel dead in their hearts.

(Laughter.) But I knew my story wasn't over, it wasn't going to end.

I had to tap into everything I had learned about soap operas.

Like Erica, I had to have the courage to refuse to surrender, so I decided to fight every day.

Like Stephanie, I was vulnerable and had to sacrifice my ego.

I had to ask for help many times in many states.

Like Carly, I had to adapt and evolve my skills, my mindset and my situation. And like Stefano, I had to be resilient and resurrect myself and my career like a phoenix out of the ashes.

I was finally interviewed.

After 15 years in journalism and entertainment and 9 months of unemployment, I got an entry-level job offer after this one interview.

I was 37 years old and resurrected from the dead.

We all go through what seems like an end, but we can choose to make it a beginning.

She looks like Tina, who miraculously survived that waterfall. I hate leaving cliffhangers hanging, so Tina and Cord divorced, but remarried three times before the show ended airing in 2012.

So remember, as long as you have breath in your body, it's never too late to change your story.

thank you.

(applause)

At the age of 6, I received a gift.

My first grade teacher had this brilliant idea.

She wanted us to not only experience receiving gifts, but also learn the virtues of complimenting each other.

So she had us all come to the front of the classroom and buy all of us presents and pile them up in the corner.

And she said, "Why don't we stand here and compliment each other?

When your name is called, go and take your present and sit down. ”

What a great idea!

What could go wrong?

(Laughs) Well, originally there were about 40 people, so I cheered from the bottom of my heart every time someone's name was called.

And there were 20 left, 10 left, 5 left ...

And 3 left.

And I was one of them.

And the compliments stopped.

Well, at that moment I cried.

And the teacher was in a panic.

She was like, "Hey, can anyone say something nice about these guys?"

(laughter) "No one? OK, why don't we go get some presents and sit down.

So behave yourself next year, maybe someone will say something nice about you. ”

(Laughter) Now, as I explain this, you probably know that I remember this very well.

(Laughter.) But I don't know who felt bad that day.

Was it me or was it the teacher?

She must have realized that she had turned a team-building event into a public roast of three six-year-olds.

And without humor.

Watching people get taunted on TV was funny.

Nothing interesting happened that day.

I mean, it's a version of me, and I would die to avoid being in that situation again, being rejected in public again.

That's one version.

Then fast forward eight years.

When Bill Gates came to my hometown of Beijing, China, to speak, I saw his message.

I fell in love with that man.

Great, I thought I knew what I wanted to do now.

That night I wrote a letter to my family telling them that by the time I was 25, I would have built the biggest company in the world, and that company would buy Microsoft.

(Laughter) I totally embraced this idea of ​​conquering, or ruling, the world.

And this was not made up by me, I wrote the letter.

And here it is -- (Laughter) You don't have to read this all the way through -- (Laughter) This is also bad handwriting, but I've highlighted a few key words.

(laughs) So...

It was another version of me, the conqueror of the world.

Well, two years later, I was given the opportunity to come to the United States.

Because that's where Bill Gates lived, right?

(Laughter) I thought that was the beginning of my entrepreneurial journey.

Then fast forward another 14 years.

I was 30 years old.

No, I didn't start the company.

I hadn't even started.

I was actually a marketing manager for a Fortune 500 company.

And I felt stuck. was stagnant.

why is that?

Where is the 14-year-old boy who wrote that letter?

It wasn't because he didn't try.

Because every time I had a new idea, every time I wanted to try something new at work, every time I wanted to make a suggestion, to speak in front of a group of people, it felt like a constant battle between the 14 and 6 year olds.

One wanted to conquer the world, that is, to make a difference, while another feared rejection.

And each time a 6-year-old won.

And this fear continued even after I started my own company.

So I started my own company when I was 30. If you want to be Bill Gates, you have to start a business sooner or later, right?

When I was an entrepreneur, I was offered an investment opportunity and was turned down.

And that rejection hurt me.

It hurt so much that I wanted to quit there.

But I wondered if Bill Gates would simply refuse to invest and quit.

Would a successful entrepreneur quit like that?

no way.

And this is where it clicked for me.

Ok, I can build a better company.

I can build a better team and a better product, but one thing is certain: I have to be a better leader.

I have to become a better person.

I can't let that 6-year-old dictate my life anymore.

I have to put him back in his place.

So I sought help online.

Google was my friend.

(Laughter) I asked, "How do I overcome my fear of rejection?"

I have written many psychology articles on where fear and pain come from.

Then I came up with a bunch of "so-so" inspirational articles that say, "Don't take it personally, just get over it."

Who doesn't know that?

(laughter) But why was I still so scared?

Luckily, I found this site.

It's called Rejection Therapy.com.

(Laughter) "Rejection Therapy" is a game invented by this Canadian entrepreneur.

His name is Jason Camry.

And the basic idea is to go out and look for rejection for 30 days, get rejected at something every day, and finally desensitize yourself from the pain.

And I like the idea.

(Laughter) I said, 'You know what? I'm going to do this.

And 100 days you will feel rejected. ”

And then I came up with my own rejection idea and made it into a vlog.

So here is what i did.

The blog looked like this.

First day...

(Laughter) I borrow $100 from a stranger.

So this is where I went to work.

When I came downstairs, I saw a big man sitting behind my desk.

he looked like a security guard.

So I just approached him.

And I was just walking, and it was the longest walk of my life. The hair on the back of my neck stood on end, I was sweating and my heart was pounding.

And I got there and said, "Hey doctor, can I borrow a hundred dollars?"

(Laughter.) And he looked up and said, "No."

"why?"

And I just said, "No? I'm sorry."

Then I turned around and just ran.

(laughs) I was so embarrassed.

But I filmed myself, so that night I saw myself being rejected and knew how scared I was.

She looked like this kid from The Sixth Sense.

I saw dead people.

(laughs) But then I met this guy.

You know, he wasn't that threatening.

He was a chubby, lovable guy who once asked me, "Why?"

In fact, he encouraged me to explain myself.

And I could say a lot.

I could have explained it, and I should have been able to negotiate.

I didn't do that.

All I did was run.

Wow, I felt like this was kind of the epitome of my life.

Every time I felt even the slightest bit of rejection, I just ran as hard as I could.

And what do you know?

The next day, whatever happens, I'm not going to run.

I stay engaged.

Day 2: Request "Refill Hamburger".

(Laughter) I remember going to a hamburger place, finishing my lunch, going to the cashier and saying, "Hi, can I have another hamburger?"

(Laughter) He was totally confused, "What's a hamburger refill?"

(laughs) I said, "Well, it's kind of like refilling drinks, but it also comes with a burger."

Then he said, "Sorry, we don't have refills on burgers."

(Laughter.) There was a rejection here, and I could have run away, but I stayed.

I said, ``I love your burgers. I love your joint.

(Laughter) And he said, "Okay, I'll talk to my manager about it, and maybe I'll do it, but unfortunately I can't do that today."

Then I left.

By the way, I don't think I've ever had a second serving of a hamburger.

(Laughter) I think it's still there.

But the sense of life and death that I had felt at first was no longer there. That's because I kept working, which meant I didn't run.

I said, 'Wow, I'm learning so much already.

wonderful. "

And day three: get an Olympic donut.

My life changed here.

I went to Krispy Kreme.

It is a donut shop that unfolds mainly in the southeastern United States.

I'm sure there are some here as well.

So I went into the house and said, "Can you make me a donut that looks like the Olympic symbol?"

Basically, string five donuts together..." I mean, there's no way for them to say yes, right?

The donut maker took me very seriously.

(Laughter) So she got out a piece of paper and started writing down the colors and rings and thinking, 'How do I make this?

And 15 minutes later she came out with a box that looked like Olympic rings.

And I was very impressed.

I couldn't believe it.

And the video has been viewed over 5 million times on Youtube.

The world couldn't believe it either.

(Laughter.) You know, it got me in newspapers, talk shows, everything.

And I became famous.

A lot of people started emailing me saying, "What you're doing is great."

But as you know, fame and notoriety did me no good.

What I really wanted to do was learn and change myself.

So I turned my remaining 100 days of rejection into this playground, this research project.

I wanted to see what I could learn.

And I learned a lot.

I have discovered so many secrets.

For example, I found that I could actually turn a 'no' into a 'yes' if I didn't run away or was rejected. That magic word is "why."

So one day I went to a stranger's house and knocked on the door with this flower in my hand and said, "Hey, can I plant this flower in your backyard?"

(laughter) And he said no.

But before he left, I said, "Hey, can you tell me why?"

And he said, "Well, I have a dog that digs up whatever you put in your backyard.

I don't want your flowers to go to waste.

If you want to do this, go across the street and talk to Connie.

she loves flowers ”

that's what i did.

I went across and knocked on Connie's door.

And she was very happy to see me.

(Laughter) And 30 minutes later, there was this flower in Connie's backyard.

I'm sure it will be better now.

(Laughter) But if I had been rejected first, I would have thought it was because he didn't trust me, because I was crazy, because I wasn't dressed up, because I didn't look good.

It was neither.

That's because what I suggested didn't match what he wanted.

And he trusted me enough to use sales jargon to offer me an introduction.

Converted referrals.

And one day I also learned that I could actually say certain things and maximize my chances of getting a yes.

For example, one day I went to Starbucks and asked the manager, "Can I be an usher at Starbucks?"

He was like, "What's Starbucks glitter?"

I said, "Do you know that Walmart usher?"

You know those people who say hello before you walk into a store and basically warn you not to steal things?

We want to give Starbucks customers the Walmart experience. ”

(Laughter) Well, I don't know if that's a good thing, actually -- actually, I'm pretty sure it's a bad thing.

And he said, "Oh." So this is what he looks like. His name is Eric. And he said, "I'm not sure."

This is how he listened to me. "don't know."

So I ask him, "Is that weird?"

He's like, "Oh, that's really weird."

But as soon as he said that, his demeanor changed completely.

It's as if he puts all the doubts on the floor.

And he said, "Yes, you can do it, don't be too weird."

(Laughter) So for the next hour, I was an usher at Starbucks.

I said hello to every customer that came in and sent a toast to the holiday season.

By the way, I don't know your career trajectory, but please stop greeting me.

(laughs) It was really boring.

But I realized I could do this because I said, "Is that weird?"

I mentioned the question he had.

And when I said, "Is that weird?", I wasn't weird.

I mean, I actually, like him, thought this was weird.

And I've learned time and time again that if you mention any questions people may have before you ask them, you gain their trust.

People were more likely to say yes to me.

And I knew I could make my life's dream come true...

by asking.

I was born into a family of four generations of teachers. My grandmother always said to me, 'Hey, Gia, you can do whatever you want, but it would be great if you could be a teacher.

(Laughs) But I wanted to be an entrepreneur, so I didn't become an entrepreneur.

But it was my dream to actually teach something.

So I said, "What would happen if I listened to and taught university classes?"

I was living in Austin at the time, so I went to the University of Texas at Austin and knocked on the professors' doors and said, "Can I teach your class?"

The first few times I got nowhere.

But I didn't run, so I kept running. And on the third try, the professor was very impressed.

"No one has ever done this before," he said.

And I prepared a power point and a lesson.

He said, "Wow, this works.

Would you like to come back in two months? I will introduce it according to my curriculum. ”

And two months later I was teaching a class.

this is me. You probably can't see it, but this is a bad photo.

Sometimes you get rejected by lighting, right?

(laughter) But it's amazing, when I finished teaching that class, I went home crying. I thought I could make my life's dream come true just by asking.

I used to think I had to achieve all these things, I had to be a great entrepreneur, I had to get a PhD to teach, etc. But no, I just asked. I can teach you.

And although you can't see it in the picture, I quoted Martin Luther King Jr.

why? Because my research has shown that the people who really change the world, the people who change the way we live and think, are the ones who have met initial and often violent rejection.

People like Martin Luther King Jr., Mahatma Gandhi, Nelson Mandela, and even Jesus Christ.

These people didn't let rejection define themselves.

They define themselves by their reaction after being rejected.

And they accepted the refusal.

And we don't have to be such people to learn about rejection, and in my case rejection was my curse, my boogeyman.

I've been running away from it and it's haunted me all my life.

Then I started accepting it.

I turned it into the greatest gift of my life.

I started teaching people how to turn rejections into opportunities.

I use blogs, I use talks, I use books that I just published, and I build technologies that help people overcome their fear of rejection.

When you are rejected in life, when you face the next obstacle or failure, think of possibilities.

please don't run

Just hug it, it may also be a gift for you.

thank you.

(applause)

Our lives depend on the invisible world.

Remember the past week.

Have you watched TV, used GPS, checked the weather, or eaten?

Many of these things that make our daily lives possible depend directly or indirectly on satellites.

And while we take the services that satellites provide for granted, satellites themselves deserve our attention because they leave a lasting imprint on the space they occupy.

People around the world rely on satellite infrastructure every day for information, entertainment and communication.

Agriculture and environmental monitoring, Internet connectivity, navigation, and more.

Satellites also play a role in the operation of financial and energy markets.

But these satellites that we rely on every day have a lifespan.

Propellant can run out, fail, or naturally reach mission life.

At this point, these satellites effectively become space junk, cluttering the orbital environment.

Imagine driving down the highway to run errands on a beautiful sunny day.

Turn on the music, roll down the windows, and let the cool breeze blow through your hair.

It feels good, right?

Everything was going well until suddenly the car lurched in the middle of the highway and stalled.

So you have no choice but to abandon the car at that spot on the highway.

Perhaps they were lucky enough to move the car to the shoulder lane out of the way of other traffic.

Just a few hours ago, your car was a useful machine for everyday life.

Now it's a useless hunk of metal that takes up valuable transportation space.

And imagine international roads filled with broken down vehicles that are just getting in the way of other traffic.

And imagine if a real collision did occur, the debris would scatter everywhere and thousands of tiny pieces would become new obstacles.

This is the paradigm of the satellite industry.

Satellites that no longer function are often left out of orbit for years or simply moved out of the way as a temporary solution.

And there are no international laws in space that force us to clean up after ourselves.

So the world's first satellite, Sputnik 1, was launched in 1957, but only three total launch attempts were made that year.

Over the decades, dozens of countries around the world have launched thousands more satellites into orbit, and the frequency of launches will only increase, especially given the potential for constellations of over 900 satellites.

Now we send satellites into different orbits as needed.

One of the most common places we transmit satellites is in low earth orbit, probably for imaging the earth's surface up to an altitude of about 2,000 kilometers.

Because satellites there are naturally influenced by the Earth's atmosphere, their orbits naturally decay and eventually burn out, probably within decades.

Another common location where we transmit satellites is geostationary orbit at an altitude of about 35,000 kilometers.

The satellites there stay in the same place on Earth while the Earth rotates, which enables communications and television broadcasting, for example.

A satellite in such a high orbit could remain there for centuries.

And then there are orbits coined the term "graveyard," eerie junk or discard orbits. Here, some satellites are deliberately placed at the end of their life so as not to interfere with their general operational orbit.

Of the roughly 7,000 satellites launched since the late 1950s, only one in seven is currently operational, and in addition to the defunct satellites, hundreds of thousands of marble-sized shards and millions of paint-chip-sized debris are orbiting the Earth.

Space debris is a major risk not only for space missions, but also for the satellites we rely on every day.

Now, with space debris and junk becoming a growing concern, national and international efforts are underway to develop technical standards to limit further debris generation.

For example, there are recommendations for spacecraft in low-Earth orbit to leave orbit within 25 years, but that's still a pretty long time, especially if the satellite hasn't been operational in years.

Also responsible for moving dead geostationary spacecraft into graveyard orbit.

However, it is understood that none of these guidelines are binding under international law and are implemented through national mechanisms.

These guidelines are also not long-term, proactive, or address existing debris.

They are in place only to limit future debris generation.

Space junk is no one's fault.

Now, Mount Everest is often given the dubious honor of being the world's highest garbage dump, so it's actually an interesting comparison of new approaches to how we interact with the environment.

Decades after first conquering the world's highest peak, you may have read in the news that the mountains of trash left behind by climbers are beginning to raise concerns and that there is speculation that Nepal will crack down on climbers with tougher penalties and legal obligations.

Of course, the goal is to persuade climbers to clean up after themselves, so local nonprofits might pay climbers who bring back excess waste, or expeditions might organize voluntary cleanup trips.

But many climbers still feel that independent groups should govern themselves.

There are no easy answers, and even well-meaning conservation efforts often run into problems.

But that doesn't mean we can't do everything we can to protect the environment we rely on and depend on, and like Everest, the remoteness and inadequate infrastructure of the orbital environment make waste disposal a daunting problem.

But we cannot reach new heights and build even higher, otherworldly dumps.

The reality of space is that if a satellite component fails, repair opportunities are practically limited and cost a lot of money.

But what if we were smarter about how we designed our satellites?

What if all satellites, regardless of which country they were manufactured in, had to be standardized in some way for recycling, maintenance, or active deorbit?

What if there actually is a strong international law to force the disposal of used satellites instead of removing them as a temporary solution?

Or maybe the satellite makers would have to charge a deposit to launch the satellite into orbit, and that deposit would only be returned if the satellite was disposed of properly or had a certain amount of debris removed.

Alternatively, satellites may need to be equipped with technology to accelerate deorbit.

There are some encouraging signs.

For example, the UK's TechDemoSat-1, launched in 2014, is designed to be decommissioned via a small drag sail.

This works well because the satellites are small, but for higher satellites, satellites in larger orbits, or larger satellites overall, like the size of a school bus, other disposal options are needed.

So, while it may sound crazy in the short term, you might get hooked on things like high-powered lasers and traction with nets and tethers.

And one really cool possibility is the idea of ​​an orbital tow truck or a space machine.

Imagine if a robotic arm in some sort of space tug could repair broken parts of a satellite and make it usable again.

Or what if that very same robotic arm could refuel the propellant tanks of a spaceship that relies on chemical propulsion as much as you do, or me refueling the fuel tanks of a car?

Robotic repair and maintenance could extend the life of the hundreds of satellites that orbit the Earth.

Whatever disposal or cleanup options we come up with, it's clear that it's not just a technical issue.

There are also complex space laws and politics that we have to work out.

Simply put, we haven't found a way to use space sustainably.

It is our job as humans to explore and innovate to transform the way we live and work, and in space exploration we are literally moving beyond the boundaries of our planet.

But as we push boundaries in the name of learning and innovation, we must remember that environmental accountability will never go away.

Low Earth orbit and geostationary orbit are definitely jammed, and in the same way that you never leave a broken down car in the middle of a highway, you can't keep launching new satellites to replace broken ones without doing anything first.

The next time you use your phone, check the weather, or use GPS, think about the satellite technology that makes those activities possible.

But at the same time, please think about the impact satellites have on the environment around us, and help spread the message that we must work together to mitigate that impact.

Earth's orbit is breathtakingly beautiful and the gateway to our exploration.

It's up to us to keep it.

thank you.

(applause)

The first question is this.

We have two exploration programs.

One is NASA. NASA is on a mission to explore the great universe, heaven that everyone wants to go to if they are lucky.

And it turns out that we have Sputnik, Saturn, and other signs of space exploration.

Another agency within our government also has another program on ocean exploration.

It's with NOAA, the National Oceanic and Atmospheric Administration.

And my question is this: "Why are we ignoring the ocean?"

I don't know if there is a reason, but here's why I asked that question.

If you compare NASA's annual budget for sky exploration, that year's budget will cover NOAA's 1,600 years of ocean exploration budgets.

why? why are we looking up? Is it because it's heaven?

And is hell here? Is it a cultural issue?

Why are humans afraid of the sea?

Or do we just assume that the ocean is just a dark, dark place that offers nothing?

We take you on a 16 minute journey around 72% of the planet. Please fasten your seat belt.

OK. And what we try to do is immerse yourself in my world.

And I think what I'm trying to do is to:

I will make it now in case I forget.

Everything I'm about to tell you wasn't in the textbooks when I was in school.

And most of all, it wasn't even in my college textbooks.

I'm a geophysicist and in every earth science book I read in school I had to answer wrong to get an A.

We used to mock continental drift. It was something we laughed at.

We learned about the Marshall Cay geosynclinal cycle, which is crap.

In today's context, it was silly, but it was the law of geology, vertical tectonics.

Most of what we experience in ocean exploration and discovery has been discovered by chance.

Most of them are accidental discoveries.

We were looking for something and we found something else.

And everything we're about to talk about equates to a glimpse of the tenth percentile. Because that's all we saw.

I have a feature.

This is a characterization of what would happen if we were able to remove the water.

It gives the false impression that it is a map.

Not a map.

In fact, I have a different version in my office where I ask people, "Why are there mountains here in this area, but nothing here?" And they said, "Um, I don't know," and they said, "Is that a crush zone? Is it a hot spot?"

No, no, that's the only place the ship was.

Most of the Southern Hemisphere is unexplored.

There were more probes there in Cook's time than there are now. very.

have understood. So we're going to immerse ourselves in 72 percent of the planet. Because it's really simplistic to think that the Easter Bunny put all its resources on the continent.

(Laughter.) You know, that's totally ridiculous.

We are always playing a zero-sum game.

You know, we do this and we remove it from other things.

I only believe in enriching the economy.

And we leave a lot of stuff on the table, 72 percent of the planet.

As I will point out later in the presentation, 50 percent of the United States is under the sea.

The 50 percent of the countries that we own have all jurisdictions, all rights to do whatever we want, are under the ocean, and we have a better map of Mars than that 50 percent.

why? OK. Well, I started exploring the hard way.

Back then – in fact, my first expedition was when I was 17. 49 years ago.

Do the math, I'm 66. and went out to sea on Scripps' ship. And I was about to sink in a huge stormy sea. And I was too young to think that would be great.

I used to be a bodysurfer, so I thought, "Wow, that's a wave!"

And although we nearly sank the ship, I was engrossed in continuing the expedition. In the last 49 years, I have made about 120, 121 expeditions. I still do.

But in the beginning, the only way I could reach the ocean floor was by diving into a very small submarine called a submarine and descending to the ocean floor.

I have dived in a series of different deep sea submersibles.

Alvin, Seacliffe, Cyana and our major deep submersibles all have about eight.

In fact, on a good day, there may be four or five humans at the average depth of the Earth. Maybe four or five of the billions of humans that we do.

So it's very difficult to get there if you do it physically.

But I was hooked, and graduate school was the dawn of plate tectonics. And then we realized that the largest mountain range on earth is under the sea.

Mid-ocean ridges run around like the seams in a baseball.

This is on the Mercator projection.

But if you apply this to an equal-area projection, you'll find that mid-ocean ridges cover 23 percent of the Earth's total surface area.

Nearly a quarter of our planet is a single mountain range, and we hadn't entered it until after Neil Armstrong and Buzz Aldrin went to the moon.

So we went to the moon, played golf there, and then went to the biggest sights on earth.

And as geoscientists of the time, we were interested in these mountains not only because of their tremendous size that dominated the Earth, but also because of the role they played in shaping the Earth's crust.

It is along the axis of the mid-ocean ridge where the great crustal plates separate.

And like a living organism, you tear it apart, bleed melted blood, rise from the asthenosphere to heal its wounds, harden, form new tissue, and move aside.

But until the summer of 1973 and 1974, when a group of seven of us dived into a small submarine and became the first humans to enter the Great Rift Valley, no one had actually entered the actual location of what we call the boundaries of Creation, the Rift Valley.

We went down into the rift valley.

This is correct for all but one. It means it's pitch black.

Photons cannot reach the ocean's average depth of 12,000 feet, so it's completely pitch black. 9,000 feet in the Rift Valley.

Most of our planet doesn't feel the warmth of the sun.

Most of our planet is in eternal darkness.

Photosynthesis does not occur in the deep sea.

And without photosynthesis, there would be no plants, and as a result, there would be very few animals inhabiting this underworld.

Or so we thought. So our first expedition focused entirely on exploring the boundaries of creation, observing the volcanic terrain that runs along the entire 42,000 miles.

Tens of thousands of active volcanoes run along all of this 42,000 miles.

Tens of thousands of active volcanoes.

There are two orders of magnitude more active volcanoes on the ocean floor than on land.

So the area is a surprisingly active area, not just a dark and boring place. It's a very lively place.

And it is torn apart.

But at the time we were dealing with a specific scientific problem.

I didn't understand why the mountain was in tension.

Plate tectonics theory knew that when plates collided, it was only natural that they would collide with each other, causing the crust to thicken and rise.

That's why you can pick up shells on Everest.

It wasn't flooded, it was pushed up there.

I understood about mountains in compression, but I didn't understand why they are in tension.

It can't be. It wasn't until one of my colleagues said, "It looks like a heat blister to me, and the mid-ocean ridge must be a cooling curve." We said, "Let's find out."

I punched out a lot of heat probes. Everything made sense except the shaft lacked heat. I didn't have enough heat.

It was hot. It wasn't hot enough.

So we came up with multiple hypotheses. So maybe there are little green people ingesting it. A lot of things are happening.

But the only logical [explanation] was that there were hot springs.

That means there must be an undersea hot spring.

We sent an expedition to look for the lost heat.

So we went along this mountain range, into the region along the Galapagos Rift Valley, and found the lost heat.

It was amazing. This giant chimney, this giant giant chimney.

We approached them by submersible.

We wanted to get a temperature probe, so we plugged it in, looked at it, and it was stuck off the scale.

The pilot said, "It's hot, isn't it?"

(Laughter) And then we realized that our rover is also made of the same material. It may have melted. However, it turned out that the exit temperature was 650 degrees Fahrenheit, hot enough to melt lead.

This is the real thing on the Juan de Fuca Ridge.

What you see is an incredible pipe organ of chemicals welling up from the sea.

Everything in this photo is commercial grade: copper, lead, silver, zinc and gold.

So the Easter Bunnies put things on the ocean floor and have massive heavy metal deposits that we're making in this mountain range.

We have found a large amount of large commercial grade ore along this range, but it appeared to be smaller than what was found.

We have found countless lives in a world that shouldn't exist. A giant tube worm 10 feet tall.

I remember having to use my own vodka to steep the vodka because it didn't handle formaldehyde.

We went and found these incredible seashells sitting on barren rocks. A big clam, it didn't look like a clam when I opened it.

And when I cut them open, there were no shell-like structures.

It has no mouth, no intestines, no digestive organs.

Their bodies had been completely taken over by another organism, bacteria, who had found a way to replicate photosynthesis in the dark through a process we now call chemosynthesis.

Our textbooks don't say that. Our textbooks don't say that.

We didn't know about this life system.

we didn't anticipate that.

Looking for the missing heat, we found it.

So we wanted to accelerate this process.

We wanted to escape this silly journey up and down the submarine. The average depth of the ocean is 12,000 feet. Two and a half hours to go to work in the morning. 2 and a half hours home. 5 hours commute.

Bottom time is 3 hours and average distance traveled is 1 mile.

(Laughter) Above 42,000 miles of mountains. Job security is great, but it's not the way to go.

So I started designing a new telepresence technology that replicates itself using a robotic system. This eliminates the need to cycle vehicle systems.

We began to introduce it into exploration and continued to make amazing discoveries with new robotic technology. Again, move from one part of the mid-ocean ridge to another, looking for another.

Scientists neglected to watch, but they encountered incredible life forms.

They encountered new creatures they had never seen before.

But more importantly, they discovered structures underground that they didn't understand.

It didn't make sense. They weren't on top of the magma chamber.

they shouldn't be there. And we named it Lost City.

And the Lost City was marked by these incredible limestone formations and upside-down pools. Look at that

How do you do that? It's upside down water.

I went in and tapped it and found it had Drano's pH.

Although it is an extreme environment of pH 11, chemosynthetic bacteria live there.

And hydrothermal vents were in an acidic environment.

Life existed all along in the alkaline environment of pH 11 on the other side.

I mean, life was a lot more creative than we thought.

Randomly discovered again. Just two years ago, research off the coast of Santorini, where people sunbathe on the beach unnoticed in the nearby caldera, uncovered an amazing hydrothermal vent system and more life systems.

It was two miles away from where people went to sunbathe, but people were unaware of the existence of this system.

Again, we stop at the water's edge.

I recently dived in the Gulf of Mexico and found a puddle this time not upside down but right side up.

bingo. You may think you are in the air until the fish swim by.

What you are seeing is a saltwater puddle formed by salt diapers.

There was methane nearby. I have never seen a methane volcano.

Instead of spewing lava, it was spewing large bubbles of methane. And they were creating these volcanoes, and not lava flows, but mud flows coming out of the earth, driven by it - I've never seen one before.

Going further, there is not only natural history but also human history under the sea. Our findings on the Titanic.

Recognition that the deep sea is the largest museum on earth.

It's packed with more history than all land-based museums combined.

But we have just broken through it.

I checked the save state.

We found the Bismarck at an altitude of 16,000 feet. And then I found Yorktown.

People always ask, "Have you found the right ship?"

Yorktown was written on the stern.

(Laughter) More recently, I've been researching ancient history.

How many ancient sailors had a bad day? A million.

We've found these in places they shouldn't have been, along ancient trade routes.

This shipwreck sank 100 years before the birth of Christ.

This ship sank with a prefabricated home improvement Roman temple.

And this one was sunk in the time of Homer, 750 BC.

More recently, it has ventured into the Black Sea, where it continues to explore.

There is no oxygen there, making it the largest reservoir of hydrogen sulfide on Earth. The wreck is perfectly preserved.

All their organic matter is perfectly preserved. We start excavating them.

We are going to start shipping the perfect corpses with DNA.

Look at the save state. There are still traces of the carpenter's advertisement. Look at the state of those artifacts.

You can still see the beeswax dripping. When they fell they sealed it.

This ship sank 1500 years ago.

Fortunately, we were able to persuade Congress.

We start going to the hill and lobby.

And we recently stole a ship from the US Navy.

An Oceanos explorer on a mission.

That mission is as great as you can get.

Its mission is to go where no one on earth has been before.

I was watching it yesterday and it was in Seattle. OK.

(Applause.) Coming online this summer, the journey of discovery begins.

But you never know what you'll find when you go out with our technology.

But make no mistake, it will be going to unknown America.

This is the part of the United States under the sea.

We own all of that blue, but like I said, specifically for the Western Territorial Trust, we don't have maps for them. We don't have their maps.

We have a map of Venus, but not of the Western Territorial Trust.

How this is done -- I don't know what it will discover.

You never know what you might discover.

We intend to discover ancient shipwrecks, Phoenicians off the coast of Brazil, or new rock formations, new life.

So we're going to run it like an emergency hospital.

We plan to connect our command center via a high-bandwidth satellite link to a building we're building at the University of Rhode Island called the Interspace Center.

In it, like running a blue gold team of nuclear submarines, you switch it off and on and run it 24 hours a day.

Once a discovery is made, it will immediately appear in the Command Center after 1 second.

But it's also connected through the Internet (the new Internet highway that makes the Internet look like a dirt road on the information highway) and has 10 gigabits of bandwidth.

We will step into territory unknown to us.

It's like a big blank slate on Earth. Create maps within hours and distribute them to major universities.

It turns out that 90% of the country's oceanographic knowledge is concentrated in 12 universities. They are all on I-2.

Then build a command center.

This is a remote center at the University of Washington.

she is talking to the pilot She's 5,000 miles away, but she's in charge.

But the advantage of this is that you can spread it to your children.

You can spread it.

They can follow this expedition. Program Launched -- Jim, where are you? Jim Young helped launch a program called The Jason Project. Most recently, we launched a program in collaboration with the Boys and Girls Club of America. This allowed us to use the excitement of Exploration and Live Exploration to motivate and excite them and give them something they were already ready for.

I'm not going to let an adult drive my robot.

I don't have enough gaming experience.

However, I am going to let an unlicensed kid take over control of my vehicle systems.

(Applause.) Because we want to create -- we want to create the classrooms of tomorrow.

We have tough competition and need to be motivated, but it's all being done.

By eighth grade, you'll be able to win or lose to an engineer or a scientist.

The game isn't over. Finished by the second year of junior high school. It hasn't started yet.

We are not only proud of our university.

We should be proud of our junior high school.

And having the best secondary schools in the world will produce the best kids out of that system.

Because that's what we want. this is what we want.

This is a young woman, not watching a football game, not watching a basketball game.

Watching the expedition live from thousands of miles away, she's starting to understand what she's seeing.

And when the jaw drops, we can let you know.

So much information can be put into its mind that it goes into full Receive mode.

(Applause.) I hope one day this person will become an engineer or scientist fighting for the truth.

And the last question, the last question, why don't we consider going to sea?

Why is there a program to build settlements on Mars, a program to consider colonizing the Moon, but no program to consider how to colonize our own planet?

And that technology is just around the corner.

thank you very much.

(applause)

Like many of us, I have had several careers in my life. The content varied, but the first job laid the foundation for it all.

I was a home birth midwife throughout my 20s.

Giving birth to a baby taught me valuable and sometimes surprising things, like how to start a car at 2am.

When it's 10 degrees below zero.

(laughs) Or how to revive a father who fainted at the sight of blood.

(Laughter) Or you can cut the umbilical cord to make a beautiful navel.

But when I quit midwifery and started other careers, these weren't the things that stuck with me or guided me.

What stuck with me was this fundamental belief that each of us comes into this world with a unique value.

When I looked at a newborn baby's face, I caught a glimpse of its worth, its unapologetic sense of self, its unique radiance.

I use the word "soul" to describe that brilliance. That's because it's the only word in English that comes close to the name of what each baby brings into the room.

Every newborn was unique like a snowflake, a unique combination of biology, ancestry and mystery.

And as the baby grows, layer by layer, the little one begins to cover its soul in order to fit into the family, to adapt to culture, community and gender.

We were born this way, but -- (laughter) but as we grow up, a lot of things happen that make us...

We want to hide our soulful eccentricities and truthfulness.

We've all done this before.

Everyone in this room is a former baby -- (Laughter) with a unique birthright.

But as adults, we spend a lot of time feeling uncomfortable in our own skin, like we have ADD (Deficit Authenticity Disorder).

But those babies aren't - not yet.

Their message to me was, "Reveal your soul and look for the radiance of your soul in others."

it's still there.

And this is what I learned from women in labor.

Their message was to stay open even when things get tough.

A woman's cervix usually looks like this.

It's a small, tight muscle at the bottom of the uterus.

And during childbirth, you have to stretch from here to here.

ah!

Fighting that pain only creates more pain and blocks what you want to be born.

I will never forget the magic that happens when a woman stops resisting pain and opens up.

It was as if a cosmic force had noticed it and sent a wave of help.

I never forgot that message. Now, when a difficult or painful event in life or work happens, of course I resist at first, but then I remember what I learned from my mothers. It's about being open.

Stay curious.

Ask the pain what it brings.

I want to create something new.

And there was another big soul lesson. That's what I learned from Albert Einstein.

He wasn't present at any of the births, but -- (laughter) that was a lesson about time.

At the end of his life, Albert Einstein concluded that our normal hamster-running life experience is an illusion.

We run faster and faster, trying to get somewhere.

And all the while, beneath surface time lies a whole other dimension where past, present and future merge into deep time.

And there is nowhere to go.

Albert Einstein called this state, this dimension, "Just Being".

And when he experienced it, he said, he knew a sacred awe.

When I gave birth to my baby, I was forced off the hamster wheel.

Sometimes I just had to sit breathing with my parents for days, hours. just exist.

And I had a great sense of sacred awe.

These are the three lessons I learned from midwives.

The first is to reveal your soul.

2: I try to be open when things get difficult or painful.

And third, get off the hamster wheel every now and then and step deep into time.

Those lessons have served me well throughout my life, but they really helped me recently when I took on the most important job of my life.

Two years ago my sister was in remission from a rare blood cancer and the only treatment left for her was a bone marrow transplant.

And, unexpectedly, she found the perfect match. It turned out to be me.

I come from a family of four girls, and when my sisters found out I was their exact genetic match, their reaction was, "Really? You?"

(Laughter) “Is it perfect for her?”

This is quite typical for siblings.

In a fraternal society, many things happen.

There is love, there is friendship, there is protection.

But there is also jealousy and rivalry, rejection and aggression.

In fraternity, it is from there that many of the first layers that cover our soul begin to be assembled.

When I found out I was a match for my sister, I went into study mode.

And it turns out that the premise of the port is very simple.

High-dose chemotherapy destroys all the cancer patient's bone marrow and replaces it with millions of healthy bone marrow cells taken from a donor.

And we do everything in our power to ensure that those new cells are engrafted in the patient.

I also learned that bone marrow transplants are dangerous.

Even if my sister survives the deadly chemotherapy, she will face yet another challenge.

My cells may attack her body.

And her body may reject my cells.

They call this a rejection or an attack, both of which can kill her.

rejection. attack.

The word had a familiar ring to it in the context of siblings.

My sister and I have had a long history of love, but also a long history of rejection and aggression, from small misunderstandings to major betrayals.

We weren't in a relationship to discuss deep things. But like many of our brothers and people in all kinds of relationships, we were hesitant to speak the truth, reveal our wounds, and admit our wrongdoings.

But when I learned about the dangers of rejection and aggression, I knew it was time to change this.

What if we left the bone marrow transplant to the doctors and did what came to be called a "soul transplant"?

If we face the pain we cause each other, can we listen instead of rejecting and attacking?

can you forgive me

Can we merge?

Could it tell our cells to do the same?

To persuade my skeptical sister, I turned to my parents' scripture, The New Yorker magazine.

(Laughter) I sent her a comic page to explain why she needed to see a therapist before taking bone marrow and transplanting it into her body.

here it is.

"I have never forgiven him for what I made up in my head."

(Laughter.) I told my sister that maybe we were doing the same thing, and I was carrying a story I made up in my head to keep us apart.

And I told her that after the transplant all the blood in her veins would be my blood made from my bone marrow cells, and that in the nucleus of each of those cells was my complete set of DNA.

"I'll be swimming in you for the rest of my life," I said to my little sister, who was a little frightened.

(Laughter) "I think we should settle the relationship."

Health crises lead people to quit their jobs, jump out of planes and do all sorts of dangerous things. And my sister had to say yes to several intense therapy sessions.

We stared at and released years of stories and assumptions about each other, blame and shame until only love remained.

People said it took a lot of courage for me to have a bone marrow harvest, but I don't think so.

What felt brave to me was a different kind of harvesting and transplanting, a soul transplant, getting emotionally naked with another human being, putting aside pride and defenses, pulling up layers, and sharing each other's weaker souls.

I called for midwifery lessons. "Reveal your soul."

Be open to fear and pain.

Look for sacred awe.

This is the bone marrow cells after harvesting.

That's what they call it -- a "harvest," like an idyllic farm-to-table event -- (Laughter) I swear it's not.

And here is my brave and brave sister who received my cell.

After the transplant, we spent more and more time together.

It was like we were little girls again.

Past and present fused.

We have entered a deep time.

I left the hamster wheel of work and life to spend time with my sister on an isolated island of sickness and healing.

We spent months together in isolation wards, hospitals, and her home.

In our fast-paced society, this kind of work is not supported or even appreciated.

We believe it interferes with real life and important work.

We are concerned about mental exhaustion and financial costs. Certainly there are economic costs.

But I was getting paid in a currency our culture had completely forgotten about.

I was rewarded with love.

I was rewarded with soul.

I had my sister pay for it.

My sister said the year after the transplant was the best year of her life, and it was a surprise.

She suffered a lot.

But, she said, life couldn't be sweeter, and that because we opened our souls to each other and told the truth, we became unapologetic and who we were.

She always said what she had to say.

She did what she always wanted to do.

Same thing happened to me.

I have found the courage to be honest with people in my life.

I said my truth, but more importantly, I pursued the truth of others.

It wasn't until the final chapter of this story that I realized how well my midwife had trained me.

After having the best year of my sister's life, the cancer returned and this time there was nothing the doctors could do.

They gave her only a few months to live.

The night before my sister died, I was sitting by her bedside.

She was very small and skinny.

I could see blood pulsing down her neck.

It was my blood, her blood, and our blood.

If she dies, a part of me will die too.

I tried to understand it all, how in becoming one with each other we became who we were, our soul selves, and how in facing the pain of the past and opening up to it, we were finally free from each other, and how in taking a step beyond time, we are now and forever connected.

My sister left me many things, and I leave you with only one of them now.

You don't have to wait for a life-or-death situation to settle the relationships that are important to you, to offer the marrow of your soul and to seek it from another human being.

all of us can do this.

We can become something of a new kind of first responder, taking the first courageous step towards our opponent and doing or trying to do something other than rejection and aggression.

We can do this with our brothers, friends and colleagues.

It is possible despite the disconnection and discord that surrounds us.

We can do this for the souls of the world.

thank you.

(applause)

what is a parent?

what is a parent?

It's not an easy question.

Today we have adoptees, stepfamilies and surrogates.

Many parents face difficult questions and difficult decisions.

Should I tell my child about sperm donation?

If so, when?

What words should I use?

Sperm donors are often referred to as 'biological fathers', but should the term 'father' really be used?

As a philosopher and social scientist, I have explored these questions regarding the concept of parenthood.

But today, I will tell you what I learned from talking with my parent and child.

I will show you that they know what is most important to their family, even if their family is a little different.

Showcase their creative ways of dealing with difficult questions.

But I will also show you the concerns of parents.

We interviewed couples who underwent fertility treatment using donor sperm at Ghent University Hospital.

In this treatment timeline you can see two points where the interview was conducted.

It included heterosexual couples whose men for some reason did not have good quality sperm, and lesbian couples who obviously needed to find sperm elsewhere.

Children also participated.

I wanted to know how children defined concepts like parenthood and family.

In fact, I asked them that, and they never meant it that way.

I drew an apple tree instead.

This allowed me to ask abstract, philosophical questions without running away.

As you can see, the apple tree is empty.

This shows my research approach.

By designing techniques like this, you can't make the interview as meaningful or content as possible. Because I want to hear it from them.

I asked them: What would your family look like if they were apple trees?

Then they could take paper apples for everyone they thought was part of the family, write their names on them, and hang them wherever they wanted.

And I have a question.

Most children started with parents and siblings.

One started with my grandparents' dead dog, Boxer.

At this point none of the children started mentioning the donor.

So, I asked them about their origin story.

I said, 'Before you were born, it was just mom and dad, or mom and mom.

Can you tell me how you became a family? ”

and they explained.

One said, "My parents didn't have good seeds, but there are kind men out there who have spare seeds.

They take them to the hospital and put them in big jars.

My mother went there and took two out of the jar and gave one to me and one to my sister.

She put the seed in her belly--somehow--she got so big and there I was. ”

Hmm.

So only when they started mentioning the donor did I ask him questions in their own words.

I said, "If this was an apple to a kind man with a seed, what would you do with it?"

And one boy was holding an apple and thinking aloud.

And he said, "I'm not going to put this on the line with anything else.

He is not part of my family.

But I'm not going to put him on the ground.

It's too cold and hard.

I think he should be in the trunk because he made my family possible.

I would be really sad if he didn't do this because my family wouldn't be here and neither would I. ”

Parents also created family stories, stories to tell their children.

One couple explained insemination by taking their children to a farm and watching a veterinarian inseminate a cow.

Why not?

That's how they describe it. Create your own family story.

DIY。

And then we had another couple who made a book. One book for each child.

They were truly works of art that contained their thoughts and feelings during treatment.

I had a parking ticket for the hospital.

So, finding ways, words and images to tell your family story to your kids is DIY.

And though these stories were so diverse, they all had one thing in common. It was a story of admiration for a child and a quest for that child.

It was about how special my child was and how deeply I loved him.

And studies so far show that these children are doing well.

They don't have more problems than other children.

But these parents also wanted to justify their decisions through the stories they told.

They wanted their children to understand why they created families this way.

The underlying fear was that children would disapprove and reject their non-genetic parents.

And the fear is understandable. Because we live in a very heteronormative and hereditary society. A world that still believes that a true family consists of a mother, father, and their genetically related children.

good.

I would like to tell you about a teenage boy.

He was conceived by a donor but was not included in our study.

One day he got into an argument with his father and yelled, "What are you going to do to me?"

You're not even my father! ”

That's exactly what the parents who participated in our study feared.

Well, the boy immediately apologized and they made up.

But the most interesting thing is the father's reaction.

"This riot had nothing to do with a lack of genetic ties," he said.

It was about puberty, it was difficult.

That's what they do at that age.

It will pass. ”

What this guy shows us is that when something goes wrong, we shouldn't immediately think it's because our family is a little different.

These things happen in every family.

And every parent may wonder, "Am I a good enough parent?"

These parents too.

They wanted to do what was best for their child above all else.

But they also sometimes wondered, "Am I the real parent?"

And their insecurities existed long before they became parents.

When I started treatment, when I first saw the counselor, they wanted to treat me right, so I paid close attention to the counselor.

Ten years later, they still remember the advice they received.

So when they thought about the counselor and the advice given to them, we discussed it.

And one lesbian couple said: "When a son asks, 'Do I have a father?' we will say, 'No, you don't have a father.' But we won't say anything more unless he asks because he may not be ready for it.

The counselor said yes. ”

good.

I don't know; that's just not how we answer children's questions.

Like, "Milk, is it made in a factory?"

We say, "No, it comes from cows," and we talk about farmers and how the milk gets to the store.

We don't say, "No, milk is not factory-made."

Something strange happened here, and these kids, of course, noticed it.

One boy said, "I asked my parents a lot of questions and their attitude was really strange.

I have a friend at school and she is made the same way.

When I have questions, I just go ask her. ”

He's smart.

Problem solved.

But his parents didn't realize it. And that wasn't what they had in mind, what the counselors had in mind when they said how important it was to be an open-communicating family.

That's the weird thing about advice.

When we give people pills, we first collect evidence.

We test and follow up.

We want to know what this drug does and how it affects people's lives, and rightly so.

And any advice?

It is not enough to give advice or expert advice that is theoretically correct or well-intentioned.

It must be evidence-based advice that actually improves the patient's life.

So the philosopher in me would like to suggest a paradox for you. We recommend that you stop following advice.

But yes.

(Applause.) I'm not going to tell you what went wrong here. I cannot do justice to the warmth we felt for those families.

Remember the book and the trip to the farm?

When parents do something useful for themselves, they do great things.

As a family member, remember that what a family needs is a warm relationship, in whatever form it takes.

And you don't have to be an expert to create them.

It can be hard work, but most of us do it well. Sometimes advice can help.

In that case, keep three things in mind.

Work with the advice that will help your family.

Remember. You are an expert because you live a family life.

And finally, have faith in your own abilities and creativity. Because you can do it yourself.

thank you.

(applause)

In the spring of 2004, I was a new mother and young rabbi, and the world was in turmoil.

Maybe you remember.

Every day we heard horrific reports of the Iraq War.

A wave of terror was sweeping over the world.

Humanity seemed to be spinning out of control.

I remember the night I read about the serial bombings in the Madrid metro. I got up and walked to the crib where my 6 month old baby girl was sleeping peacefully. Then I heard the rhythm of her breathing and felt this tension rush through my body.

We were living in a time of ideological, political, religious and demographic seismic shifts.

Everything felt so unsettled.

And I remember thinking, 'Oh my god, what kind of world did we bring this kid into?

And as a mother, as a religious leader, what would I have wanted to do about it?

Of course, it was clear that religion would be a major battlefield in this rapidly changing situation, and it was already clear that religion was a key part of the problem.

The question for me was, could religion also be part of the solution?

Well, throughout history people have committed terrible crimes and atrocities in the name of religion.

And in the 21st century, it was clear that religious extremism was on the rise again.

Our research shows that hostilities and religion-related violence have increased around the world over the past 15 to 20 years.

But you don't need research to prove it. Because how many people today would be surprised to hear stories of bombings and shootings and later learn that the last word spoken before the trigger was pulled or the bomb exploded was the name of God?

Today, it scarcely raises an eyebrow to learn that yet another has decided to show his love for God by taking the lives of God's children.

In America, religious extremism looks the same as white anti-abortion Christian extremists broke into the family planning system in Colorado Springs and killed three people.

It also looks like a couple inspired by Islamic State's arrival at an office party in San Bernardino and killing 14 people.

And even when religion-related extremism does not lead to violence, it is still used as a political wedging issue, leading people to cynically legitimize the subordination of women, prejudice against LGBT people, racism, Islamophobia and anti-Semitism.

This is deeply worrying for those of us who are concerned about the future of religion and the future of faith.

We have to call this a religious fiasco.

But the problem is that this is not the only challenge facing religion today.

At the same time that religion needs to be a powerful force against extremism, it suffers from a second pernicious trend: what I call religious routinism.

This is when our organizations and leaders are stuck in paradigms that are mechanical, perfunctory, lifeless, visionless and soulless.

Let me explain what this means.

One of the great blessings of being a rabbi is standing with a couple under a chupa, under a wedding canopy, and helping them publicly declare and sanctify the love they have found for each other.

But here's what I'm asking you all to do, from your own experience, or just imagine the difference in the intensity of your experience under the canopy of a wedding and perhaps your 6th or 7th anniversary experience.

(Laughter) And if you're lucky enough to live 16 or 17 years, if you're like most people, you'll probably wake up in the morning and realize you've forgotten your favorite restaurant reservations, you've forgotten a lot of things like cards, and you just hope and pray your partner forgets.

Well, religious rituals and ceremonies are essentially designed to serve the function of anniversaries, to be vessels for us to hold the vestiges of the sacred and revelatory encounters that gave birth to religion in the first place.

The problem is that the date is still on the calendar centuries later, but the romantic relationship ended long ago.

Then we find ourselves endlessly mindlessly repeating words that mean nothing to us, getting up and sitting down because someone asked us to, clinging to jealously guarded doctrines that are completely and grossly out of touch with modern reality, and engaging in perfunctory practices simply because they have always been so.

Religion is on the decline in America.

Churches, synagogues and mosques alike complain about how difficult it is to maintain relevance to a generation of young people who seem utterly uninterested not only in the institutions at the heart of our traditions, but even in religion itself.

And what they need to understand is that there is a generation today who is just as disgusted by the violence of religious extremism as they are by the lifelessness of religious everydayism.

Of course, there are bright spots in this story.

About 12-13 years ago, in view of the crisis of these two simultaneous tendencies in religious life, I began to wonder if there was a way I could reclaim the center of my own Jewish tradition and make it meaningful and purposeful again in a world of fire.

I began to wonder what if we could harness the great minds of our generation to rethink what the next iteration of religious life might look like in bold, robust, and imaginative ways.

Well, we had no money, no space, no game plan, but we had email.

So my friend Melissa and I sat down and wrote an email and sent it to a few friends and colleagues.

The gist of it was, "Before we defend our religion, why don't we get together this Friday night and think about what to do with our own Jewish heritage?"

I was expecting maybe 20 people to come.

As a result, 135 people came.

They were cynics and seekers, atheists and rabbis.

That night, many said they had the first meaningful religious experience of their lives.

So I decided to do the only reasonable thing someone would do in such a situation. I quit my job and tried to build this audacious dream: a reinvented, reimagined religious life called "IKAR", which means "essence" or "heart of the matter."

Now, IKAR is not the only one in the religious world today.

Incidentally, there are Jewish, Christian, Muslim and Catholic religious leaders, many of whom are women, who have set out to reclaim the heart of our traditions and firmly believe that now is the time for religion to be part of the solution.

We return to our sacred traditions and recognize that all our traditions contain raw materials that justify violence and extremism, but also compassion, coexistence and kindness. That when others choose to read our texts as instructions for hate and revenge, we can choose to read those same texts as instructions for love and forgiveness.

I now find a common religious ethos manifesting itself in the form of a rejuvenating religion in the country, in communities as diverse as the Jewish indie entrepreneurs along the coast, to the women-only mosques, to the black churches of New York and North Carolina, to the sacred buses of nuns that carry messages of justice and peace across the country.

And while theology and practice vary widely among these independent communities, some common and consistent threads can be found among them.

This time, we will introduce four of these initiatives.

The first is awakening.

We live in a time of unprecedented access to information about all the global tragedies taking place in every corner of the planet today.

Within 12 hours, 20 million people saw footage of Aylan Kurdi's tiny body washing up on Turkish shores.

We have all seen this photo.

We saw a photo of a five-year-old child pulled from the rubble of an Aleppo building.

And when we look at these images, we are called to some kind of action.

My legend tells of a traveler walking down the street who saw a beautiful house burning and said, "How is it possible that something so beautiful burns and nobody cares?"

Likewise, we learn that the world is on fire and realize that it is our job to keep our minds and eyes open, and our responsibility to help put out the flames.

This is very difficult.

Psychologists say the more we know about how our world is broken, the less likely we are to do anything about it.

It is called mental paralysis.

It shut down at some point.

Well, somewhere along the way our religious leaders forgot that it's our job to make people uncomfortable.

It's our job to wake people up, pull them out of apathy and pain, and insist that they should do what they don't want to do and see what they don't want to see.

Because we know that social change will only happen when we wake up enough to see our houses burning (applause).

The second principle is hope. I want to say this about hope.

Hope is not naive, hope is not an opiate.

Hope may be the greatest act of defiance against the politics of pessimism and the culture of despair.

Because what hope brings us is that it lifts us out of the container that captivates us and binds us from the outside, so that we can dream again and think broadly.

They are out of your control. ”

This summer, I saw hope manifest in an African-American church on Chicago's South Side. So I took my little daughter, who is now 13 centimeters taller and a few centimeters taller than me, and listened to a sermon by my friend, Reverend Otis Moss.

That summer, 3,000 people had already been shot in Chicago between January and July.

We entered the church and listened to Pastor Moss preaching. And after Pastor Moss' sermon, this gorgeous women's choir of 100 women got up and started singing.

"I need you. You need me.

I love you. I want you to survive. ”

And in that moment I realized that this is what religion should be.

It is about restoring a sense of purpose, a sense of hope, a sense that you and your dreams are fundamentally important in this world, and that should teach you that you are not important at all.

The third principle is the principle of strength.

We have a rabbinical tradition of walking around with two pieces of paper in our pockets.

Some say, "I am but dust and ashes."

it's not about me.

I can't control everything and I can't do this alone.

On another piece of paper was written, "For me the world was created."

In other words, I can't do everything, but I'm sure I can do something.

I can forgive you.

I can love

can appear.

You can protest.

I can join this conversation too.

We still have religious rituals and postures that hold a paradox between powerlessness and power.

In the Jewish community, the only time of the year when we fully bow down to the ground is during Holy Days.

It is a sign of complete submission.

Now in our community, when we rise from the ground, we stand with our hands up and say, "I am strong, I am powerful, I am worthy.

I can't do everything, but I can do something. ”

In a world that is complicit in making us believe we are invisible and powerless, religious communities and religious rituals remind us that no matter how much time we spend on this earth, whatever gifts and blessings we have been given, whatever resources we have, we can and must use them to make the world a little more just and a little more loving.

The fourth and final one is interconnectivity.

A few years ago, a man walking along the coast of Alaska found a soccer ball with Japanese characters written on it.

He took a picture of it and posted it on social media, and a Japanese teenager contacted him.

He lost everything in the tsunami that devastated his homeland, but managed to retrieve a soccer ball that had been floating in the Pacific Ocean all along.

How small our world has become!

It's so hard to remember how interconnected we all are as humans.

But we know that it is the system of oppression that benefits most from the lies of outright individualism.

Let me explain how this works.

I don't care if young black people are harassed by the police. Because my white-looking Jewish kids will probably never be stopped for the crime of black driving.

Well, no, because this is my problem too.

And what do you think? Transphobia, Islamophobia and all forms of racism are all our problems too.

And anti-Semitism is also a problem for all of us.

Because Emma Lazarus was right.

(Applause.) Emma Lazarus was right when she said that no one is free until we are all free.

We are all in this situation together.

And now, somewhere where the four currents of awakening, hope, strength and interconnectedness meet, there is a burgeoning multi-religious justice movement in the country, riding the countercurrent to argue that religion can and must be a force for good in the world.

Our hearts are wounded by the failed religion of extremism, but we deserve more than the failed religion of everydayism.

The time has come for religious leaders and communities to lead the spiritual and cultural change that this country and the world so desperately need: towards love, justice, equality and dignity for all.

We believe our children deserve more.

thank you.

(applause)

Chemical.

The mere mention of this word brings to mind the unfortunate memories of being bored in biology and physics classes in high school.

But let me assure you that what you did there has little to do with science.

It was just the "something" of science.

It was the history of what other people had discovered.

As a scientist, what interests me most is "how" science is done.

Because science is knowledge in process.

We make observations, infer explanations for those observations, and make predictions that can be tested by experiments and other observations.

Here are some examples.

First of all, people noticed that the earth was below, the sky was above, and both the sun and the moon seemed to revolve around them.

Their guessed explanation was that the Earth must be the center of the universe.

Prediction: All things should orbit the Earth.

This was only really tested when Galileo got one of his first telescopes. And when he looked into the night sky, there he found Jupiter, a planet with four moons orbiting around it.

He then used those moons to follow the orbit of Jupiter and discovered that Jupiter, too, was not orbiting the Earth, but rather the Sun.

Therefore the predictive test failed.

And this led to the abandonment of the theory that the Earth is the center of the universe.

Another example: Sir Isaac Newton noticed an object falling to the earth.

A putative explanation was gravity, the prediction that everything should fall to Earth.

But, of course, not everything falls to earth.

So have we abandoned gravity?

No, we modified the theory to say that gravity pulls things toward the earth unless there is an equal and opposite force in the other direction.

This allowed us to learn something new.

We started paying more attention to birds and bird feathers, and thinking about all the discoveries that came out of that way of thinking.

In other words, test failures, exceptions, and outliers can teach us something we don't know and lead us to something new.

That's how science progresses. This is how science learns.

Sometimes in the media, and even more rarely, even scientists, say something has been scientifically proven.

But I hope you understand that science will never prove anything conclusively forever.

Hopefully, we will remain curious enough to explore science, and humble enough to recognize when we find the next anomaly, the next anomaly. Like the moons of Jupiter, it can tell us things we don't really know.

Let's change gears here.

The caduceus, or medical symbol, means many different things to different people, but most of the public discussion of medicine actually turns it into an engineering problem.

There are hallways of Congress and boardrooms of insurance companies looking for ways to pay insurance claims.

Ethicists and epidemiologists are trying to figure out the best way to distribute medicines, hospitals and doctors are obsessed with protocols and checklists, trying to figure out the best way to safely administer medicines.

These are all good things.

But they also assume, on some level, that medical textbooks are closed.

We begin to measure the quality of care by how quickly it can be accessed.

In this context, it's no surprise that many health care providers are starting to look a lot like Jiffy Lube.

(Laughter) The only problem is, when I got out of medical school, I didn't get a single little doohickey that a mechanic needed to plug into your car and figure out exactly what was wrong. Because medical textbooks are not closed.

Medicine is science.

Medicine is knowledge in progress.

We make observations, infer explanations for those observations, and then make predictions that we can test.

Now, the testing ground for most predictions in medicine is the population.

And from your boring days in biology class, you may remember that populations tend to be distributed around their mean as a Gaussian or normal curve.

Therefore, in medicine, we make predictions from inferred explanations and then test them on the population.

That is to say, what we know, knowledge and know-how in medicine comes from the population, but its scope is limited to the next outlier, the next exception, and, like the moons of Jupiter, tell us what we really don't know.

Currently, I am a surgeon who sees sarcoma patients.

Sarcoma is a very rare form of cancer.

It's flesh and bone cancer.

And I want to say that all my patients are outliers and exceptions.

To date, none of the surgeries I have performed on sarcoma patients have been based on randomized controlled clinical trials that are considered the best population-based evidence in medicine.

People talk about thinking outside the box, but when it comes to sarcoma, there aren't even any stereotypes.

When we are immersed in the uncertainty, unknowns, exceptions and outliers that surround us with sarcoma, what we gain is easy access to what I consider the most important values ​​for any science: humility and curiosity.

Because if I'm humble and curious, when a patient asks me a question and I don't know the answer, I will ask a colleague who may have a similar, even distinct, sarcoma patient.

We will also establish international cooperation.

Those patients will start talking to each other through chat rooms and support groups.

Through this kind of humble and curious communication, we start trying to learn new things.

As an example, here is a patient of mine who had cancer near his knee.

Thanks to the humble and curious communication in international cooperation, I found that when I had to have my knee removed due to cancer, I could reuse my ankle as a knee.

After that, they will be able to run, jump, and play with the prosthesis.

International cooperation has given him this opportunity.

It was good for him because he was in contact with other patients who had experienced it.

Exceptions and outliers in medicine therefore not only teach us what we do not know, but also lead to new ways of thinking.

Now, very importantly, all the new thinking that outliers and exceptions lead us to in medicine doesn't just apply to outliers and exceptions.

We don't just learn from sarcoma patients how to manage them.

Outliers and exceptions can tell us something very important to ordinary people.

Like a tree standing out in a forest, outliers and exceptions grab our attention and perhaps lead us to a deeper sense of what a tree is.

We often talk about losing forests for trees, but we also lose trees in forests.

But a tree that stands out in its own right makes the relationships that define it, the relationship between the trunk and the roots and the branches, more obvious.

Even if the tree is crooked, or has a very unusual relationship between its trunk, roots and branches, it nonetheless captures our attention and allows us to make observations that can then be tested in the general population.

Said sarcoma is rare.

They account for about 1 percent of all cancers.

You probably also know that cancer is thought to be a genetic disease.

A genetic disease means that cancer is caused by oncogenes that are turned on in the cancer and tumor suppressor genes that are turned off to cause cancer.

You might think that we learned about oncogenes and tumor suppressor genes from common cancers such as breast, prostate, and lung cancer, but you'd be wrong.

For the first time, we learned about oncogenes and tumor suppressor genes in just 1% of cancers called sarcomas.

In 1966, Peyton Routh was awarded the Nobel Prize for discovering that chickens had contagious sarcoma.

Thirty years later, Harold Varmus and Mike Bishop discovered what the contagious element was.

It was a virus with a gene called the src oncogene.

Now, I wouldn't say that src is the most important oncogene.

Not to mention that src is the most frequently turned oncogene in all cancers.

But it was the first oncogene.

The exception, the outlier, caught our attention and led us to something very important to tell us about the rest of biology.

TP53 is currently the most important tumor suppressor gene.

It is the most frequently turned off tumor suppressor gene in almost all types of cancer.

But we didn't learn that from common cancer.

We learned this when doctors Lee and Fraumeni were examining the families, and they realized that these families had too many sarcomas.

Said sarcoma is rare.

Remember, if a one-in-a-million diagnosis occurs twice in one family, it is all too common in that family.

The very fact that these are unusual draws our attention and leads to new kinds of thinking.

Now, many of you may say, yes, Kevin, that's great, and you certainly would, but you're not talking about bird wings.

I'm not talking about the moons floating around Jupiter.

this is a person

This outlier, this exception may lead to scientific progress, but this is human.

And all I can say is that I know it well.

I have conversations with patients with these rare and deadly diseases.

I write about these conversations.

These conversations are very awkward.

They're filled with scary phrases like "I have bad news" and "There's nothing more we can do."

In these conversations, one word can come up: "terminal."

Silence can also be quite uncomfortable.

Where there are gaps in medicine is as important as the words used in conversation.

What are unknowns?

What kind of experiments are being conducted?

Please do this little exercise with me.

The phrase "nowhere" will appear on the screen.

Notice where the white space is.

If you move that blank one space, "nowhere" becomes "here and now." Just moving the whitespace one space does the exact opposite.

I will never forget the night I entered a patient's room.

I had been in surgery for a long time that day, but I still wanted to go see him.

He was the boy I had diagnosed with bone cancer a few days earlier.

He and his mother had seen a chemotherapy doctor earlier in the day, and he had been admitted to the hospital to begin chemotherapy.

It was nearly midnight when I got to his room.

He was asleep and found his mother reading with a flashlight next to his bed.

She came out into the hall to chat with me for a few minutes.

It turns out that what she was reading was the protocol her chemotherapy doctors gave her that day.

she had it memorized.

She said, "Dr. Jones, you said you don't always win with this type of cancer, but I've been working on this protocol and I think you can.

I believe I can respond to these very difficult treatments.

I am going to quit my job. I am going to live with my parents.

I keep my baby safe. ”

I didn't tell her

I didn't stop to correct her thoughts.

She relied on protocols that, even if followed, would not necessarily save her son.

I didn't tell her

I didn't fill in that blank.

However, a year and a half later, her son died of cancer.

Should I have told her?

Now, many might say,

I have no sarcoma.

No one in my family has sarcoma.

That's fine, but it probably doesn't matter in my life. ”

And you are probably right.

Sarcoma may not be so important in your life.

But where the gaps are in medicine is important to your life.

I haven't told you a single dirty secret.

I said that in medicine we test population predictions, but I didn't tell you. Also, whenever an individual encounters medicine, it often fails to tell us that, even if the individual is firmly embedded in the general population, neither the individual nor the physician knows where the individual will land in that population.

Therefore, every encounter with medicine is an experiment.

You become the subject of an experiment.

And the result will either be good or bad for you.

As long as the medicine works well, fast service, bravado, and confident conversation are fine.

But sometimes when things go wrong, we want something else.

A colleague of mine removed a tumor from a patient's extremity.

He was worried about this tumor.

At our doctor's conference, he spoke about his concern that this is a type of tumor that has a high risk of recurrence in the same limb.

But his conversations with patients were exactly the kind of confidence patients would want.

He said, "I understand everything. I'm fine now."

She and her husband were overjoyed.

They went out, celebrated, had fancy dinners and opened bottles of champagne.

The only problem was that after a few weeks I started noticing another nodule in the same spot.

It turned out that he didn't understand everything and she wasn't ready to go.

But what happened at this point completely fascinated me.

A colleague came up to me and said, "Kevin, can you take care of this patient?"

I said, "Why, you know you are as right as I am.

you haven't done anything wrong ”

He said, "Please, just take care of this patient."

He was embarrassed—not by what he had done, but by the conversations he had, his overconfidence.

So I did a more invasive operation and then had a completely different conversation with the patient.

I said, 'Maybe I figured it all out, so you're probably fine, but this is an experiment we're doing.

Notice this.

I would like to keep an eye on this.

And we will work together to find out if this surgery is effective in getting rid of your cancer. ”

I assure you, she and her husband didn't crack another bottle of champagne after talking to me.

But she was now not only a subject of experiments, but also a scientist.

Therefore, I advise doctors to seek humility and curiosity.

Almost 20 billion times each year, people walk into the doctor's office and become patients.

You or your loved ones will soon become its patients.

How do you consult a doctor?

what do you say to them

what will they say to you?

They can't tell you what they don't know, but if you ask, they'll tell you when they don't know.

Please join the conversation.

thank you.

(applause)

Let's talk a little bit about the future direction of technology.

And more often than not, technology comes to us and we are amazed at what it brings.

But in reality, technology has a much more predictable big side. Because there are trends, urgency, and trends in technology systems of all kinds.

And those tendencies stem from the very nature of wires, switches, electronic physics, and chemistry, forming patterns that repeat over and over again.

And those patterns create these trends, tendencies.

You can think of it like gravity.

Imagine raindrops falling into a valley.

The actual path a raindrop takes down a valley is unpredictable.

I don't know where it will go, but the general direction is very inevitable and downward.

So these tendencies and urgency embedded in technical systems give us a sense of where things are headed in the big picture.

So, broadly speaking, the phone was inevitable, but the iPhone was not.

The Internet was inevitable, but Twitter was inevitable.

We have a lot of trends going on right now, but I think one of the main ones is this trend of making things smarter and smarter.

I call it cognition, cognition. Also called artificial intelligence or AI.

And I think it will be one of the most influential developments, trends, directions and drivers in our society over the next 20 years.

So, of course, it's already here.

We already have AI in place, often working in the background in hospital back-offices and used to diagnose x-rays better than human doctors.

It takes place in a law firm and is used to scrutinize legal evidence better than a human para-lawyer.

Used to fly the plane you came here for.

The human pilot was in control for just seven or eight minutes, and the AI ​​was in control the rest of the time.

And of course, Netflix and Amazon are running these recommendations in the background.

That's who we are today.

And of course, a more direct example is AlphaGo's victory over the world's greatest Go champion.

But that's not all.

When you play a video game, you are playing against an AI.

But recently, Google taught its AI to actually learn how to play video games.

Again, teaching video games is already done, but learning how to play video games is another step.

It's artificial smarts.

What we do is take this artificial smartness and make it smarter and smarter.

There are three aspects of this general trend that I think are underestimated. If you understand these three, I think you will have a deeper understanding of AI.

I think these things also help us embrace AI. Because only by embracing AI can you actually steer it.

In fact, embracing the larger trends can steer you in a concrete direction.

Now let's talk about these three different aspects.

The first is that our own intelligence has very little understanding of what intelligence is.

We tend to think of intelligence as a single dimension, like a sound that gets louder and louder.

It starts like an IQ measurement.

It starts with simple low IQ in rats and mice, maybe more in chimpanzees, maybe more in stupid people, maybe more in mediocre people like me, and maybe even geniuses.

And this single IQ intelligence is getting bigger and bigger.

That's completely wrong.

It is not intelligence, not human intelligence at all.

It rather resembles a symphony of different notes, each of which is played by a different means of recognition.

There are different kinds of intelligence in our minds.

We have deductive reasoning, emotional intelligence, and spatial intelligence. Collectively, there are probably 100 different types, with different strengths for different people.

And of course, when it comes to animals, they also have another basket. Another symphony of different kinds of intelligence, sometimes those same instruments that we have.

They can think alike, but they may have different alignments, and in some cases they may be superior to humans. For example, squirrels' long-term memory is actually phenomenal, allowing them to remember where they buried nuts.

However, it may be lower in other cases.

When we build machines, we design them the same way. In that case, some of that kind of cleverness would be far superior to ours, but many of them wouldn't come close to ours because we wouldn't need them.

So we're going to use these things, these artificial clusters, to add more artificial perceptions to the AI.

I will be very specific.

So your calculator is smarter than you already know arithmetic. GPS is smarter than spatial navigation. Google and Bing are smarter than your long-term memory.

And we're also taking these different types of thinking and putting them into cars, for example.

The reason why I want to put it in a car and make it move is because the car doesn't drive like a human being.

It's not the way we think.

That's the whole feature of it.

No distractions, no worries about whether I left the stove on, or whether I should have majored in finance.

Just drive.

(Laughter) Just drive, okay?

And indeed, we may come to promote these as "unconscious".

They have no consciousness, they don't care about them, they don't get distracted.

In general, what we try to do is have as many different types of thinking as possible.

We intend to place in space all the different types or species of thought that we can think of.

And in fact, there may be some problems in business and science that are very difficult and cannot be solved by our human mindset alone.

We may need a two-step program. It's about inventing new kinds of thinking that allow us to work together to solve very big problems like dark energy and quantum gravity.

What we are doing is creating an alien intelligence.

In a way, you can think of it like an artificial alien.

And they help us think differently. Because thinking differently is the engine of creation, wealth and the new economy.

The second aspect of this is basically using AI to bring about the second industrial revolution.

The first industrial revolution was based on the fact that we invented what we should call artificial power.

Prior to the Agricultural Revolution, everything was made with either human muscle or animal power.

It was the only way to get anything done.

The great innovation of the Industrial Revolution was that we used steam power and fossil fuels to create artificial power that could do anything we wanted.

Today, when you drive down the highway, you're commanding 250 horses with 250 horsepower at the flick of a switch. With this horse, we can build skyscrapers, build cities, build roads, and build factories that churn out chairs and refrigerators far beyond our capabilities.

And that man-made power can also be distributed to every home, factory, and farm through wires on the grid, and anyone can buy that man-made power by simply plugging in something.

So it was also a source of innovation. This is because farmers can use manual hand pumps, and with the addition of artificial power or electricity, electric pumps can be used.

Then multiply it by thousands or tens of thousands of times. That formula gave us the industrial revolution.

Everything we see, all this progress that we enjoy now, comes from the fact that we did it.

I'm trying to do the same thing with AI.

We're going to distribute it on the grid, and now you can get that electric pump.

Add artificial intelligence and you have a smart pump.

And if you multiply that by a million, it will be the second industrial revolution.

So now the car is on the highway and it has 250 horsepower, but it also has 250 mental power.

That is the self-driving car.

It's like brand new. New utility.

AI, like electricity, will flow through the grid, the cloud.

In other words, we are going to recognize everything that we have electrified.

So what I would suggest is that the formula for the next 10,000 startups is very simple, add AI to x.

That's the formula and that's what we're trying to do.

That's how we make this second industrial revolution happen.

By the way, if you log on to Google right now, you can buy AI for 6 cents per 100 hits.

It is available now.

The third aspect of this is that when you take this AI and embody it, you get a robot.

And robots will become bots, doing many of the tasks we already do.

They are trying to redefine our work because a job is just a collection of tasks and performs some of those tasks.

But they're also going to create a bunch of brand new categories, brand new tasks that you never thought you'd want to do before.

Just as automation has spawned a ton of new things we didn't know we needed before, and we can't live without them now, they will actually create new kinds of jobs, new kinds of tasks that we want to do.

They will therefore create more jobs than they take away, but it is important that much of the work we give them is work that can be defined in terms of efficiency and productivity.

If a manual or conceptual task can be specified in terms of efficiency or productivity, it is assigned to the bot.

Productivity is for robots.

What we are really good at is basically wasting time.

(Laughter) We are good at inefficiencies.

Science is inherently inefficient.

It is based on the fact that one failure after another happens.

It runs on the fact that you do tests and experiments that don't work. Otherwise, no learning takes place.

It runs on the fact that it is not very efficient.

Innovation, by definition, is inefficient. Because we build prototypes and try things that fail or don't work.

Probing is inherently inefficient.

Art is not efficient.

Relationships are not efficient.

These are all the sorts of things we gravitate toward because they're not efficient.

Efficiency is for robots.

We will also learn that we will be working with AI because they think differently than we do.

When Deep Blue defeated the world's greatest chess champion, people thought this was the end of chess.

But in fact, today it turns out that the world's greatest chess champion is not an AI.

And it's not human.

A team of humans and AI.

The best medical diagnosticians aren't doctors or AI, they're teams.

We will be working with these AIs, and I think in the future we will be rewarded for how well we work with these bots.

That's the third thing. They are different, they are useful, and they will be the ones we work with rather than against.

We work with them rather than against them.

Now, the future: where will it take us?

Twenty-five years from now, I think they will look back at our understanding of AI and say: "You didn't have AI. In fact, you didn't even have the internet compared to what you'll have 25 years from now."

There are no AI experts today.

There's a lot of money put into it, billions of dollars spent. It's a huge business, but it's no expert compared to what we'll see 20 years from now.

So we're still in the beginning of the beginning, in the first hour of everything.

We are in the first hour of the internet.

We are in the first hour about to start.

The most popular AI products that everyone will use 20 years from now have not yet been invented.

It means that you are not late.

thank you.

(laughter) (applause)

So my journey began in a one-bedroom apartment in the Bronx, NY with my two younger sisters and my immigrant mother.

Loved our neighborhood.

It was lively.

I was blowing up meringues, my neighbors were leaning over to socialize, and we were having lively conversations while playing dominoes.

It was home made and delicious.

But it wasn't that simple.

In fact, everyone at school knew the block we live on. Because it was where people came to buy cannabis and other drugs.

And because the drug trade involves conflict, we often went to bed listening to gunshots.

I spent much of my childhood worrying and worrying about our safety.

And so were our mothers.

She worried that the violence we witnessed would take our lives. Our poverty means that our neighbors, with whom we lived and shared space, do us harm.

We lived in the Bronx the whole time, but her anxiety spurred her into action, and soon we drove at breakneck speed to Connecticut with our full scholarship (laughs) to the boarding school campus.

Never underestimate the power of a mother determined to keep her children safe.

(Cheers) (Applause) For the first time in boarding school, I was able to sleep comfortably.

I left my dorm room unlocked, walked barefoot on the grass, and looked up to see a sky full of stars.

Happy novelty.

But there were other new points as well.

Immediately, I felt out of place.

I realized that I was not speaking correctly and my teacher gave me frequent public lessons on the proper way to pronounce certain words to show me how to speak correctly.

One day, my teacher instructed me in the hallway. "Oh, King."

She said aloud:

"Dena, it's not an 'axe' that runs around with an axe.

It's ridiculous. ”

At this point, you can imagine her classmates laughing, but she continued, "Think of the word as 'Donkey' and 'King' and then put the two together and say it correctly -- 'Ask'."

Once, when I walked into my classmate's dorm room, I saw her looking carefully at the valuables I had around me.

why would she do that? I thought to myself.

And then another classmate walked into my dorm room and yelled, "Eh!" When I was applying hair grease to my scalp.

When young people can't be themselves, when they are forced to edit themselves in order to be accepted, there is psychological damage.

It's a kind of violence.

After all, I am a typical successful person.

I attended boarding school and college in New England, studied abroad in Chile, and returned to the Bronx to become a middle school teacher.

I received a Truman Scholarship, a Fulbright Scholarship, and a Soros Scholarship.

I can name more.

(laughs) But I won't do it.

(Laughter) I got my PhD from Columbia University.

(Cheers) (Applause) And I got a job at Yale.

(Applause.) I'm proud of everything I've accomplished on my journey so far.

I have eternal Impostor Syndrome.

If I was invited to be a token, it's not really about me, it's about a box that someone needs to tick.

Or that I am so special that I had to leave my loved ones behind.

That's the price I and many others pay to learn while being black.

(Applause.) I'm always in control.

Are my pants too tight?

Should I wear my hair up or in a floss?

Should I speak for myself, or should my words be weakened by the words "She's mad"?

Why did I have to leave the Bronx for a better education?

And why did the process of getting a better education endure the trauma of erasing what made me a black girl from the Bronx raised by an Antiguan mother?

So given the current approach to educational reform, we can't help but ask, "What are students of color learning about themselves?"

Studies spanning three to three decades have found that students of color are suspended and expelled at three times the rate of white students, and are punished more severely for the same offenses.

They also learn this through not including their lives and stories in the curriculum.

The Cooperative Children's Book Center examined nearly 4,000 books and found that only 3 percent were about African Americans.

And they learn even more by not having a teacher like them.

An analysis of data from the National Center for Education Statistics found that 45 percent of our country's preschool through high school students are of color, while only 17 percent of teachers are of color.

Our young people of color pay a heavy price for schooling to send them the message that they must be controlled and that they must leave their identities at home to succeed.

All children have the right to a safe and secure education.

(Applause.) It is possible to create classrooms that are mentally and physically safe, where students can grow academically.

I know because I did it in my classroom when I went back to teach in the Bronx.

So what did it look like?

I guided my students around their lives, histories, and identities.

And I did all of this because I wanted my students to know that everyone around them supports them to be their best selves.

So while I couldn't control the instability of their home, the anxiety about the next meal, or the noise of sleepless neighbors, I provided them with a loving classroom that made them feel proud of who they were and that they mattered.

Every time I hear or say the word "ask," it takes me back to high school.

I'm thinking about 'donkey' and 'king', and I'm thinking of combining the two and speaking in a way that people in power would want to hear.

There are better ways to do this without forcing a double bind on children of color. The way they stay connected with their families, homes and communities. This is how you teach yourself to trust your instincts and believe in your own creative genius.

thank you.

(applause)

Knowing I'm writing about time management, people assume two things.

One is that I am always on time, but I am not.

I have four small children and sometimes it's tempting to blame them for being late, but sometimes they aren't.

I was once late for my speech on time management.

(Laughter.) We all had to savor that irony together for a moment.

The next thing they assume is that I have lots of time-saving tips and tricks here and there.

From time to time, I hear from magazines that run articles along these lines about how they can help their readers find extra time in their day.

And the idea is that if you take a little bit of time out of your daily activities and build it up, you can spend your time doing good things.

I have my doubts about the whole premise of this piece, but I'm always interested in hearing what they came up with before they call me.

Some of my favorites are doing errands that only require a right turn -- (Laughter) I'm very cautious about using the microwave. The package says 3-3 1/2 minutes, but we're fully on the underside.

And my personal favorite, which makes some sense, is recording your favorite shows on your DVR so you can fast-forward through the commercials.

That way, you save 8 minutes every 30 minutes, so you can get 32 ​​minutes of exercise while watching 2 hours of TV.

(laughs) It's true.

Do you know another way to find 32 minutes of exercise time?

You don't watch TV for two hours a day, do you?

(Laughter) Anyway, the idea is to save a little bit of time here and build it up and eventually get to all you want to do.

But after studying how successful people spend their time and observing their hourly schedules, I think this idea is completely backwards.

We don't build the life we ​​want by saving time.

We can build the life we ​​want and time will naturally be saved.

Here's what I mean.

I recently did a time diary project observing the 1,001 day life of a very busy woman.

They were busy people with demanding jobs, sometimes their own businesses, having to take care of children, maybe even parents, and community involvement.

I had them log their hours for the week so I could add up how much they worked and how much they slept, and interviewed them about their strategies for my book.

One of the women whose timelog I studied goes out for something on Wednesday nights.

When she gets home, she finds that her water heater has broken and that the entire basement is filled with water.

If you've ever had something like this happen, you know it's a very damaging, terrifying, soggy mess.

So she deals with the damage immediately after that night, the plumber comes the next day, and the professional cleaners take care of the damaged carpet the next day.

All of this is recorded in her timelog.

After all, she spends seven hours a week on it.

7 hours.

It's like finding extra time in your day.

But it would have been nice to have asked her earlier in the week, "Could you find me 7 hours to train for a triathlon?"

“Could you find seven hours to mentor seven worthy people?”

Surely she said what most of us would say is, "No, don't you know how busy I am?"

But she had to find 7 hours because the whole basement was full of water, and she found 7 hours.

And what this shows us is that time is very elastic.

We can't make more time, but it grows by the amount we choose to spend.

So the key to time management is to treat your priorities as the equivalent of a broken water heater.

To understand this, I would like to use the words of the busiest person I have ever interviewed.

Busy meant she ran a 12-person small business and had six children in her spare time.

I was reaching out to her to set up an interview about how she "got it all" and the words.

I remember it was Thursday morning, but she couldn't speak to me.

Of course, right?

But the reason she couldn't talk to me was because she was out hiking. It was a beautiful spring morning and I wanted to go hiking.

So, of course, this made me even more intrigued, and when I finally caught up with her, she explained it:

She says, "Listen, Laura, everything I do, every hour I spend is my choice."

And instead of saying, "I don't have time to do x, y, z," say, "I'm not doing x, y, z because it's not a priority."

"I don't have time" often means "it's not a priority."

If you think about it, that's a really accurate word.

You might say you don't have time to dust the blinds, but that's not true.

If you offered to pay me $100,000 to dust the blinds, I would immediately agree.

(Laughter.) I admit it's not a matter of not having enough time because that doesn't happen. That's what I don't want to do.

Using this word reminds us that time is a choice.

Of course, making different choices can have horrendous consequences, but I'm aware of that.

But we are smart people, and in the long run we certainly have the power to fill our lives with what we deserve.

So how do we do that?

How do we treat our priority as the equivalent of a broken water heater?

First you need to understand what they are.

I would like to introduce two strategies for thinking about this.

The first is the professional aspect. I'm sure many of you approaching the end of the year have given or received an annual performance review.

Reflect on your successes, or “growth opportunities,” during the past year.

This serves its purpose, but I think it would be more effective to do so with an eye to the future.

So think of it as the end of next year.

As you look back on your own accomplishments, this has been a really great year for you professionally.

What did you do to make it so great?

Now you can start writing next year's performance review.

And you can do this in your personal life as well.

I'm sure many of you, like me, will get a card with folded colored paper in December. It contains what is known as a family holiday letter.

(Laughter) A little bit of a tragic genre of literature that really shows how great the whole family is, or even more glorious, is how busy the whole family is.

But these letters have a purpose. It's about telling friends and family what you've done in your personal life this past year that was important to you.

It feels like the year is over, but I want you to know that the end of next year will be a really great year for you and the people you care about.

What did you do to make it so great?

Now you can start writing holiday letters for families next year.

please don't send

(laughs) Please don't send it.

But you can write.

And now, between your performance reviews and family holiday letters, you have a list of 6-10 goals you can work on next year.

And now we need to break these down into actionable steps.

So you may want to write your family history.

First, you can get a sense of style by reading other family histories.

Next, think about the questions you want to ask your relatives and set up an interview appointment.

Or maybe you want to run 5K.

So you have to find a race, sign up, plan a workout, and dig out shoes from the back of your closet.

And this is important, by scheduling your priorities first, treat it as the equivalent of a broken water heater.

We do this thinking for weeks before we enter that period.

A really good time to do this is Friday afternoon.

Friday afternoon is what economists might call a "low opportunity cost" time.

Most of us don't sit there on a Friday afternoon and say something like, "I'm excited to move forward with my personal and professional priorities right now."

(Laughter) But we're happy to see what they should be like.

So, take a moment on Friday afternoon to create a three-category priority list: career, relationships, and yourself.

If I create a list of three categories, I know that all three categories must contain something.

We think about careers. Relationships, yourself, to a lesser extent.

Anyway, it's a short list of 2-3 items each.

Then look over the next week to see where you can plan.

Where you plan is up to you.

I know this will be more complicated for some people than others.

So some people's lives are harder than others.

Finding time to attend a poetry class isn't easy when you're caring for multiple children on your own.

I understand

And I don't want to downplay anyone's struggles.

But I think the numbers I'm going to share with you are empowering.

There are 168 hours in a week.

24 x 7 is 168 hours.

It takes a lot of time.

If you work full time, you work 40 hours a week and sleep 8 hours, which is 56 hours a week. The remaining 72 hours are spent doing other things.

It takes a lot of time.

You said you work 50 hours a week, probably a main job and a side job.

Now, the remaining 62 hours can be spent on other things.

He said he worked 60 hours.

Well, the remaining 52 hours can be spent on other things.

He's been working over 60 hours.

is that so?

(Laughter) There was once a study that compared people's estimated working hours per week to their time diaries.

They found that people claiming to work more than 75 hours a week had about 25 hours of vacation.

(Laughter) You know which way, right?

Anyway, if you have 168 hours a week, I think you can devote time to what is important to you.

If you want to spend more time with your kids, study more for a test you're taking, work out three hours and volunteer two hours, you can do it.

This is true even if you work well beyond your full-time hours.

You have plenty of time. That is wonderful. Because what do you think?

It doesn't take a lot of time to do great things.

But what do most of us do when we have a little time?

You take out your phone, right?

Start deleting emails.

Otherwise, I'm walking around the house or watching TV.

But sometimes small moments can make a big difference.

A little bit of time can be used for a little fun.

Maybe you choose to read something great on the bus to work.

When I had a job that required two bus rides and one subway ride every morning, I would go to the library on weekends for reading material.

That made the whole experience almost, almost, enjoyable.

Breaks from work can be used for meditation and prayer.

If your work schedule is so busy that you can't have a family dinner, a family breakfast may be an alternative.

It's about looking at your entire time and knowing where the good stuff can go.

I believe this wholeheartedly.

We have time.

No matter how busy you are, you still have time to do the important things.

And if you focus on what matters, you can build the life you want in a limited amount of time.

thank you.

(applause)

This is a tuberculosis ward, and in the late 1800s when this photo was taken, 1 in 7 people died of tuberculosis.

We didn't know what caused this disease.

The hypothesis was, in fact, that your constitution is susceptible.

And it was a very romantic sickness.

Also called consumption, it was the confusion of poets, artists, and intellectuals.

And in fact, some believe it enhances sensitivity and confers creative genius.

By the 1950s, it was known that tuberculosis was caused by a highly contagious bacterial infection. This is not very romantic, but it had the advantage of potentially developing a drug to treat tuberculosis.

So doctors discovered a new drug, iproniazid, which they optimistically thought could cure tuberculosis.

They were more social and more energetic.

One medical report said they were, in fact, "dancing in the hall."

And unfortunately, this wasn't necessarily because they got better.

Many of them were still dead.

Another medical report said they were "inappropriately happy."

This is how the first antidepressants were discovered.

Accidental discoveries are therefore not uncommon in science, but they require more than just happy chance.

To discover it, you must be able to recognize it.

As a neuroscientist, I would like to talk a little bit about my first-hand experience with what I like to call the opposite of stupid luck: clever luck.

Before that, a little more background.

Thankfully, since the 1950s, several other drugs have been developed that can now actually treat tuberculosis.

And at least in the United States, but not necessarily in other countries, sanatoriums are closed and probably most of you aren't too worried about tuberculosis.

But many things that were true about infectious diseases in the early 1900s are now true about mental illness as well.

We are in the midst of an epidemic of mood disorders such as depression and post-traumatic stress disorder (PTSD).

One in four adults in the United States suffers from a mental illness. So if you haven't experienced mental illness personally or someone in your family hasn't, it's very likely that someone you know has one, even if you don't talk about it.

In fact, depression is now the leading cause of disability worldwide, surpassing HIV/AIDS, malaria, diabetes and war.

And like tuberculosis in the 1950s, its cause is unknown.

Once developed, it becomes chronic, lasts a lifetime, and there is no known cure.

The second antidepressant we discovered was also discovered by chance in the 1950s from imipramine, an antihistamine that makes people manic.

And in the case of both the tuberculosis ward and the antihistamines, someone had to be able to realize that a drug designed for one thing - to treat tuberculosis or to suppress allergies - could also be used for a completely different purpose: to treat depression.

And this kind of reuse is actually very difficult.

When doctors first saw this uplifting effect of iproniazid, they couldn't really recognize what they were seeing.

They were so accustomed to thinking of it in the framework of a tuberculosis drug that they really just listed it as a side effect, a harmful side effect.

As seen here, many of these patients in 1954 experienced severe euphoria.

And they were worried that this would somehow interfere with their recovery from tuberculosis.

They therefore recommended that iproniazid be used only in severe cases of tuberculosis and in very mentally stable patients. This is, of course, the exact opposite of how we use iproniazid as an antidepressant.

They were so accustomed to looking at this disease in terms of this one disease that they could not see the greater impact on another disease.

And to be fair, it's not entirely their fault.

Functional fixedness is a prejudice that affects us all.

We tend to think of objects only in terms of their traditional uses and functions.

And mental set is another thing. right?

It's kind of a preconceived framework for how we deal with problems.

And that's actually what makes reuse pretty hard for all of us. I think that's why we gave TV shows to people who are very good at reusing.

(Laughter) For both iproniazid and imipramine, the effect was very strong. There were people going into mania and dancing in the hall.

In fact, it's not all that surprising that they were caught.

But sometimes I wonder what else I'm missing.

Therefore, iproniazid and imipramine are more than just reuse case studies.

They have two other things in common that are really important.

One is that it has horrible side effects.

These include liver toxicity, weight gain over 50 pounds, and suicidal tendencies.

And two, they both increase the levels of serotonin, a chemical signal or neurotransmitter in the brain.

And while those two things, one or two, coming together might not have been all that important, the coming together of the two meant we needed to develop safer drugs, and serotonin seemed a very good place to start.

So we have developed drugs that are more focused on serotonin, selective serotonin reuptake inhibitors or SSRIs (most notably Prozac).

That was 30 years ago, and since then we've been mostly optimizing these drugs.

SSRIs are better than previous drugs, but they still have many side effects, such as weight gain, insomnia, and suicidal tendencies, and they take a very long time to take effect—around four to six weeks for many patients.

And it's in the patients they work with.

There are many patients who do not respond to these drugs.

So in 2016, there is still no cure for mood disorders, only medications to control symptoms, which is like taking painkillers versus taking antibiotics for an infection.

Painkillers make you feel better, but they cannot cure the underlying disease.

And the flexibility of our way of thinking allowed us to recognize that iproniazid and imipramine could be reused in this way, which led us to the serotonin hypothesis, which ironically has since become our obsession.

This is serotonin, the brain signal from the SSRI commercial.

For those unfamiliar, this is an adaptation.

And in science, we try to remove bias by running double-blind experiments or being statistically ignorant of what the outcome will be.

But even more biases lurk when we choose what to study and how we choose to study it.

That's why we've spent the last 30 years focusing on serotonin while ignoring everything else.

No cure yet. What if serotonin wasn't the only cause of depression?

What if it wasn't even the important part?

In other words, no matter how much time, money, or effort you put into it, it will never heal.

In the last few years, doctors have discovered calypsol, perhaps the first truly new antidepressant since SSRIs. This drug works very quickly, within hours to a day, but does not affect serotonin.

It acts on another neurotransmitter, glutamate.

And it's reused too.

It has traditionally been used as an anesthesia for surgery.

However, unlike other drugs that were quickly recognized, it took 20 years for Calypsol to be recognized as an antidepressant, despite the fact that it is actually a better antidepressant than perhaps others.

In fact, it was probably hard for us to recognize because of the fact that it was a better antidepressant.

There were no maniacs to inform of its effects.

So in 2013, I was at Columbia University with my colleague, Dr. Christine Ann Denny, studying calypsol as an antidepressant in mice.

And calypsol has a very short half-life, meaning it is cleared from the body within hours.

And we were just steering.

So we waited a week after injecting the mice and then did another experiment to save money.

One of the experiments I was doing involved stressing mice and using that as a model of depression.

And it didn't seem to work at all at first.

So we could have stopped there.

But I've been running this depression model for years, and the data just looked kind of weird.

It didn't look very right to me.

So I went back and re-analyzed them based on whether they had received one injection of calypsol the week before.

And it looks like this.

If you look to the far left, mouse over the new space and this is the box. Very exciting. Mice roam and explore. You can see that the pink line is actually how much the mouse is walking.

Also put another mouse in the pencil cup so you can interact with it.

In case it's not clear, this is also a dramatization.

And normal mice explore.

It gets social.

Check out what's going on.

When mice are stressed in this model of depression (middle box), they become less social and less exploratory.

They are usually just hiding in the back corners, behind cups.

Still, mice injected once with calypsol (here on the right) were exploratory and social.

They looked as if they weren't stressed at all, but that can't be the case.

So I could have stopped there, but Christine had used calypsol as an anesthetic before and had witnessed several years ago that calypsol seemed to have strange effects on cells and other behaviors that seemed to last longer, probably weeks after the drug was administered.

So we were like, "Okay, maybe this isn't completely impossible, but we were really skeptical."

So we did what science does when we're not sure, and we did it again.

And I remember being in the animal room and moving mice from box to box to test them. Christine was actually sitting on the floor with a computer on her lap out of sight of the mouse, analyzing data in real time.

And I remember we screamed out loud. Because of its effectiveness, it should not have been done in the experimental animal room.

Whatever you call it, these mice seemed to be either protected from stress or unreasonably happy.

And we were really excited.

We were really skeptical because it was so well done.

So I ran it again.

Then we ran it again with the PTSD model and again with the physiological model. It was just a dose of stress hormones.

And I had the undergraduate students do it.

And I asked a collaborator in France, who is on the other side of the world, to operate it.

And every time someone ran it, it confirmed the same.

This single injection of calypsol somehow seems to have saved me from stress for weeks.

We published this just a year ago, but other labs have independently confirmed this effect since then.

So while we don't know what causes depression, we know stress is the first trigger in 80% of cases. Also, although depression and PTSD are different illnesses, they have one thing in common.

right? Posttraumatic stress disorder is caused by traumatic stress, such as active combat, natural disasters, community violence or sexual assault, and not everyone who is exposed to stress develops a mood disorder.

And this ability to bounce back from experiencing stress without developing depression or PTSD is known as stress resilience, and it varies from person to person.

And we've always thought of it as a sort of passive trait.

There are no susceptibility or risk factors for these diseases.

But what if it was active?

Just like wearing armor, you may be able to enhance it.

We stumbled upon our first resilience-enhancing drug.

And, as I said earlier, we were on very little medication and it lasted for a few weeks. This is different from what is seen with antidepressants.

But in practice, this is similar to what we see with immunizing vaccines.

So, with immunization vaccines, it's not the vaccine in your body that protects you when you're vaccinated and weeks, months, or years later when you're actually exposed to the bacteria.

It is your own immune system that has developed a resistance and resilience against this bacterium that fights against it, so you don't actually get an infection. This is very different from our treatment, for example. right?

In that case, if you get an infection, are exposed to bacteria, become sick, and then take antibiotics to cure it, for example, those drugs actually work to kill the bacteria.

Or, as I said before, with this palliative you take medications that keep the symptoms under control, but not the underlying infection. Also, I only feel better while I'm taking it. So I have to keep taking it.

And with depression and PTSD, you're under stress here, but there's only palliative care.

Antidepressants only suppress the symptoms, so you basically have to keep taking antidepressants until the illness lasts, which is equivalent to your lifetime.

Therefore, we call drugs that enhance resilience “paravaccine”. This means something like a vaccine. It appears to protect against stress and may prevent mice from developing depression and post-traumatic stress disorder.

Also, not all antidepressants are paravaccine.

I also tried Prozac, but it didn't help.

Therefore, if it can be applied to humans, it may help protect people at predictable risk from stress-induced disorders such as depression and PTSD.

First responders, firefighters, refugees, prisoners, guards, soldiers, everyone.

To give you a sense of the scale of these diseases, the global burden of disease was estimated at $2.5 trillion in 2010. Due to the chronic nature of these diseases, the cost is even higher and is therefore expected to rise to up to $6 trillion over the next 15 years.

As mentioned before, reuse can be difficult due to our previous biases.

Calypsol, also known as ketamine, also known as Special K, is both a club drug and a drug of abuse.

It is still used worldwide as an anesthetic.

used by children. We use it on the battlefield.

In fact, it is the drug of choice in many developing countries because it does not affect breathing.

It is on the World Health Organization's list of the most essential medicines.

Had we first discovered ketamine as a paravaccine, it would have been very easy to develop it, but as it stands, we have to contend with functional fixedness and the mental sets that hold it back.

Fortunately, these are not the only compounds we have discovered that have prophylactic, quasi-vaccine properties, but every other drug or compound we discover is brand new and must go through the entire FDA approval process before it can be used in humans.

And it will take years.

So if you need something sooner, ketamine is already FDA approved.

It's generic, so it's available.

We were able to develop it in a fraction of the price and a fraction of the time.

But in fact, beyond functional fixation and mental set, another real challenge to drug repurposing is policy.

Once a drug becomes a generic drug and the patent expires, the pharmaceutical company does not make money, so there is no longer a monopoly to encourage its development, and there is no incentive.

And that's not just for ketamine. That goes for all drugs.

In any case, the very idea of ​​using drugs to prevent rather than treat mental illness is completely new to psychiatry.

20, 50, 100 years from now, we may look back on depression and PTSD now, just as we look back on tuberculosis sanatoria as a thing of the past.

This could be the beginning of the end of the mental health epidemic.

But as a great scientist once said, "Only a fool can be sure of anything.

Smart people keep guessing. ”

Thank you guys

(applause)

Tell your daughters this year that they woke up wanting coffee to find bodies strewn around the morning paper and waterlogged facsimiles of their sisters, spouses, and small children.

If this year's baby asks, of course you should, but tell them you came too late.

Admit that even in the years we rented our freedom, we didn't quite own it.

There were still laws for every use of our genitals, grabbed and stroked in our tender folds without caring about consent, but no laws were made for men to enforce it.

We have been trained to dodge, to wait, to cower and cover, and to wait, to be still.

We were told to keep quiet.

But tell your daughters about this wartime. A year before the same score occurred, just like 20 years ago, we wiped our eyes, tied our coffins with flags, evacuated from the crime scene of the club, rigged on the street, placed our bodies on the concrete following the outlines of the fallen, shouting “Of course we were important,” screaming for the missing.

Women cried again this year.

they did

In the same year we were ready.

The year in which we lost control and acted bravely was also the year in which we stared at barrels, sang cranes in the sky, crouched and parried, caught money in our hijabs, collected death threats, identified ourselves as patriots, said, "I'm 35 now, it's time to settle down and find a running mate," create a roadmap for infantile joy, be ashamed of nothing but fear, call ourselves fat, and of course, mean perfection.

This year, we were women, not brides, not adornments, not off-brand gender, not concessions, but women.

Please guide your baby.

Let me remind you that the years are over to be tame or to be small.

Some of us said we were women for the first time and took this pledge of solidarity seriously.

Some of us had children, some didn't, but no one questioned whether that made us real, worthy, or true.

Thy daughter, Thy descendant, Thy victorious successor, from the comforting side of history that is staggering toward women, if she asks of this year, she will wonder, and will ask greedily, even though she cannot comprehend your sacrifice, but she will sanctify your sacrifice, and will ask curiously, "Where have you been?"

did you fight? Were you frightened or frightened?

What color was your regret wall?

What have you done for women this year?

What bones did I have to break on this road that you made for me?

I've done enough, Mom, are you okay?

And are you a hero? ”

She asks hard questions.

She doesn't care about the arch of your brow or the weight of your clutch.

She doesn't ask for your mention.

You've already accomplished so much, does your daughter want to know what you brought, what gifts you gave, what lights you didn't extinguish?

Were you asleep or awake the whole night when they came looking for their victims?

What was the cost of staying awake?

What did you do with your privileges in the year you said your time was up?

Have you ever noticed other people's dirty spots?

Did you look away or stare directly at the flame?

Did you know your skill or did you treat it like a responsibility?

Are you fooled by the adjectives "mean" and "less than"?

Did you teach with an open mind or with a clenched fist?

where were you

Please tell her the truth. Make it your life.

Check it. Say, "Daughter, I stood there with a moment in my face like a dagger and threw it back at myself, slicing space for you."

Tell her the truth, how you lived despite the odds.

Tell her the days when you were brave, and always, always had courage, mostly yourself.

As always, tell her that she was born in a legendary age, just like you, like your mother before, and sisters next door to it.

Tell her that she was born at just the right time, just the right time to lead.

(applause)

Let me ask you a question.

How much weapons-grade nuclear material do you think it would take to destroy a city the size of San Francisco?

How many people think this suitcase is worth the money?

OK. What about this minibus?

have understood.

In fact, under the right circumstances, a dose of highly enriched uranium the size of a morning latte is enough to kill 100,000 people instantly.

Hundreds of thousands of others will be seriously ill, and parts of the city will remain uninhabitable for years, if not decades.

But forget about the nuclear latte. Because today's nuclear weapons are hundreds of times more powerful than the ones we dropped on Hiroshima and Nagasaki.

And even a limited nuclear war involving, say, dozens of nuclear weapons could lead to the end of all life on earth.

Therefore, it is very important that you know that over 15,000 nuclear weapons are currently in the hands of nine countries.

And if you live near a city or military installation, chances are it's aimed at you.

In fact, if you live in a rural area where nuclear weapons are stored all over the world, chances are you have them pointed at you.

About 1,800 of these weapons are on high alert and could be fired within 15 minutes of the president's order.

So I know this is an unfortunate problem. Maybe you are too. What was it? -- The mental exhaustion you mentioned earlier.

So I'd like to switch gears a little bit and talk a little bit about my imaginary friend. I think I'm Jasmine

At 25, Jasmine is part of the most politically and socially engaged generation in the last 50 years.

She and her friends see themselves as change agents, leaders and activists.

I think of them as the "Generation of Possibilities".

They regularly protest on issues they care about, but nuclear weapons are not among them. Jasmine was born in 1991, at the end of the Cold War, so it makes sense.

As such, she didn't grow up hearing much about nuclear weapons.

She didn't have to hunker down and hide under her desk at school.

For Jasmine, Fallout Shelter is an Android Store app.

Nuclear weapons will help you win the match.

That's really unfortunate. Because now we need Generation Possible to help us make some really important decisions about nuclear weapons.

For example, will we further reduce nuclear arsenals around the world, or will we spend billions, perhaps trillions, modernizing them so that by the time Jasmine is my age, we will be telling our children and even grandchildren about the threat of a nuclear holocaust?

And if you've ever paid any attention to cyberthreats, or read about the Stuxnet virus, for example, or had your email account, Yahoo account, or phone hacked just in case, then you can imagine a whole new world of damage that modernization can cause in the age of cyber warfare.

Now, if we look at money, $1 trillion could do a lot to feed people, educate them, and employ them, all of which could reduce the threat of nuclear war in the first place.

So -- (applause) This is very important right now, because nuclear weapons are fragile.

We have solid evidence that terrorists are trying to get their hands on them.

Just last spring, when four retirees and two taxi drivers were arrested for trying to sell nuclear material for $200 million in the Republic of Georgia, they demonstrated that the nuclear black market is alive.

And this is really important. Because there have been dozens of nuclear weapon-related accidents and most of us have never heard of them.

Here in the United States, we dropped nuclear weapons on the Carolina River twice.

In one case, one of the bombs dropped from an Air Force plane did not detonate because the nuclear core was stored elsewhere on the plane.

In another case, five switches designed to prevent the weapon from activating and detonating upon impact with the ground failed.

Fortunately, the sixth was not.

But if that wasn't enough to get your attention, there was the 1995 Black Blount case.

Russian radar engineers then saw a U.S. nuclear missile enter straight into Russian airspace.

It turned out to be a Norwegian rocket that was collecting data on the Northern Lights.

But at the time, Russian President Boris Yeltsin was within five minutes of launching a full-scale retaliatory nuclear strike against the United States.

Therefore, most of the world's nuclear powers are committed to eliminating these weapons of mass destruction.

But think about it. The Treaty on the Non-Proliferation of Nuclear Weapons, signed by 190 nations and the most widely adopted arms control treaty in history, does not set a specific deadline for the world's nuclear powers to dismantle their nuclear weapons.

Now, when John F. Kennedy decided to send humans to the moon and bring them back, or to do both, he didn't say, "Hey, whenever you guys get to the moon."

he gave us a deadline.

He gave us a challenge that would have been unbelievable just a few years ago.

And through his challenges, he has inspired scientists, marketers, astronauts and school teachers.

He gave us a vision.

But with that vision, he sought to give us, and most people don't know this, a partner in the form of our fiercest rival of the Cold War era, the Soviet Union.

Because part of Kennedy's vision for the Apollo program was cooperation with the Soviet Union, not competition.

And apparently, Soviet Prime Minister Nikita Khrushchev agreed.

However, Kennedy was assassinated before the collaboration could materialize, and the conception was postponed.

However, the co-innovation promise between these two nuclear powers has not completely disappeared.

Because in 1991, when Jasmine was born and the Soviet Union collapsed, both countries were working on a project that, in the truest sense of the word, would be truly incredible today. That is, the US secured the scattered nuclear material and sent cash to Russia to hire unemployed nuclear scientists when Russia needed it most.

They worked with American scientists to convert weapons-grade uranium into the kind of fuel that could be used in nuclear power.

They called it "megatons to megawatts."

As a result, both countries had plans for more than 20 years that meant that virtually every 1 in 10 American light bulbs would be fueled by a former Russian warhead.

So these two countries have done something really daring together.

But the good news is that today the international community has a chance to do something just as bold.

Some experts say it will take 30 years to abolish nuclear weapons and stop supplying the materials needed to make them.

For better or worse, that would require the kind of innovation that underpinned both the Manhattan Project and the megaton-to-megawatt program that produced nuclear weapons.

It requires design constraints.

They are the basis for creativity and a kind of platform for international cooperation. specific date. This is a coercive mechanism. And a positive vision that inspires action.

It will take until 2045.

The year 2045 marks the 100th anniversary of the birth of nuclear weapons in the New Mexico desert.

But this day is also important for another reason.

It is predicted to usher in a new moment in human development, the Singularity, in which the lines between artificial and human intelligence blur, computing and consciousness become almost indistinguishable, and advanced technologies help solve some of the biggest problems of the 21st century: hunger, energy, poverty, and the advent of an age of affluence.

And we will all go to space to become a multi-planetary species.

Now, those who truly believe in this vision will first say that they still do not know exactly how we will get there.

But there are the values ​​behind their vision and the willingness to ask, "How can I?"

It has inspired generations of innovators.

They work backwards from desired results using a creative problem-solving technique called collaborative design.

They will break through obstacles.

They are redefining what we all think is possible.

But the problem is that vision of abundance is at odds with a world that still relies on a 20th-century core principle called “mutually assured destruction.”

It must be building the foundations for the 22nd century.

It must be about strategies to ensure mutually secure prosperity, or at least mutual survival.

Now, every day, I get to meet people who are true pioneers in the field of nuclear threats.

As you can see, many of them are young women, and like Marina Robinson Snowden here, who is developing new, better ways to detect nuclear warheads, they are doing very interesting things that will help overcome significant hurdles to international disarmament.

Or Melissa Hanham, who uses satellite imagery to understand what's happening around remote nuclear facilities.

Or Europe has Beatrice Finn. He has continued his campaign to outlaw nuclear weapons in international courts and just won a big victory at the United Nations last week.

(Applause.) And yet, despite all this talk about moon shots in this culture, far too few members of the Possible Generation and those of us who lead them are challenging nuclear weapons.

It's almost like there's a taboo.

But I do remember what Kennedy said. It is to the effect that humans can be as big as the solutions to all the problems we create.

The question of human destiny, he said, is not beyond human.

I believe

And I'm sure many of you here believe so too.

And I know the Possible generation believes that too.

So it's time to commit to a date.

Let's end it on the 100th anniversary of the establishment of the nuclear weapons emblem.

After all, by 2045 we will hold billions of people hostage to the threat of nuclear annihilation.

Surely 100 years would be enough.

Indeed, a century of economic development and the development of military strategy will give us better ways to manage global conflicts.

Indeed, if there is a global moonshot worth supporting, this is it.

Right now, in the face of real threats—for example, North Korea's recent nuclear weapons test conducted in defiance of sanctions—sensible people disagree as to whether we should maintain a certain number of nuclear weapons to deter aggression.

But the question is, "What is the magic number?"

Thousand?

Hundred? Ten?

And we must ask: Who should be responsible for them?

But I think we can all agree that for Jasmine's generation, 15,000 of them represent a greater global threat than promise.

Therefore, the time has come to promise a world that breaks the shackles that nuclear weapons place on our imagination. Instead of slowly moving forward from the present with all the mental models and prejudices of the past, we invest in working backwards from the future we crave and creating creative solutions.

It's time for us, as leaders of all disciplines, to dedicate our resources to addressing this old problem in new ways and asking ourselves, "How can we do this?"

In a world beyond nuclear weapons, how can we deliver on our promise to make Jasmine's generation more secure?

Please join us.

thank you.

(Applause.) Thank you.

(applause)

So what if I could make a designer baby for you?

What if you, the future parent, and I, the scientist, decided to go down that path together?

We thought, "That's a bad idea," but what if many of our family, friends, and colleagues actually made that decision?

Let's fast forward exactly 15 years from now.

Let's say it's 2030 and you're a parent.

Next to you is your daughter Marianne. In 2030, she is so-called natural because she is not genetically modified.

And because you and your partner made that decision consciously, many in your social circle kind of look down on you.

They think you're a Luddite or technophobic.

Marianne's best friend Jenna, who lives next door, is completely different.

She was born a genetically engineered designer baby with tons of upgrades.

yes. upgrade.

And these enhancements were introduced using a new genetic recombination technique with the amusing name of CRISPR. You know, like something crispy, this is CRISPR.

The scientists Jenna's parents hired for millions of dollars to do this introduced CRISPR across a panel of human embryos.

And they did genetic testing and predicted that the tiny little embryo, Jenna's, would be the best of them all.

And now Jenna is a real person.

She is sitting on your living room carpet playing with your daughter Marianne.

And since your family has known each other for years, you know how extraordinary Jenna is.

She is incredibly smart.

Let's be honest, she's smarter than you, and she's five.

She's beautiful, tall, athletic, the list goes on and on.

And indeed, there is a whole new generation of GM kids like Jenna.

And for now, they look healthier than their parents' generation, better than yours.

And they have lower medical costs.

They are immune to many health conditions, including HIV/AIDS and genetic diseases.

It all sounds so great, but I can't help but have a certain uneasy feeling, a hunch, that something is wrong with Jenna. And you've likely had similar feelings about other GM kids you've met.

Also, you read in the paper earlier this week that studies of children born as designer babies show they may have some problems, such as increased aggression and narcissism.

But what came to your mind more quickly than that was the news you just got from Jenna's family.

She's so smart that she'll be attending a different school than your daughter Marianne, which will throw your family into turmoil.

Marianne cried all the time, and last night when you took her to bed to kiss her goodnight, she said, "Dad, can Jenna be your friend yet?"

Now, when I've been telling you this imaginary 2030 story, I have a feeling I've put some of you in this sci-fi framework. right?

I assume you are reading a science fiction book.

Or maybe it's the idea of ​​Halloween mode.

But this is exactly what could happen to us just 15 years from now.

As a stem cell and genetics researcher, I understand this new CRISPR technology and its potential implications.

And while we may face that reality, much depends on what we decide to do today.

And if you're still thinking in sci-fi mode, consider that earlier this year there was a big shock to the scientific world, yet the general public knows very little about it.

Just a few months ago, Chinese researchers reported the creation of genetically modified human embryos.

This was the first time in history.

And they did it with this new CRISPR technology.

It didn't work perfectly, but I still think they kind of left the door of Pandora's box ajar here.

And I think some people will try to use this technology to make designer babies.

Now, before I continue, some of you may raise your hands and say, "Stop, Paul, wait a minute.

Isn't that illegal?

You can't suddenly have a designer baby. ”

And indeed, to some extent, they are right.

Some countries couldn't do that.

But in many other countries, including my country, the United States, there are actually no laws about this, so in theory it is possible.

And this year there was another event that resonated with the sector, and it happened not far from here in England.

And the UK is traditionally the strictest country when it comes to genetically modifying humans.

It was illegal there, but they made an exception to that rule just a few months ago.

They passed new laws allowing the creation of genetically modified humans with the noble purpose of preventing rare types of genetic diseases.

But I still believe that the combination of these events pushes us even further towards accepting genetic modification in humans.

So I've been talking about this CRISPR technology.

What is CRISPR in the first place?

So if you think about GMOs we are all familiar with, like tomatoes and wheat, this technology is similar to the technology used to make them, but dramatically better, cheaper, and faster.

So what is it?

It's actually like a genetic swiss army knife.

We can assume that this is a Swiss Army knife with a wide variety of tools. One of the tools is like a magnifying glass or DNA's GPS, allowing you to target a specific location.

And the next tool is like a pair of scissors that can cut DNA in place.

And finally, we have a pen that can literally rewrite the genetic code of the place.

It's really that simple.

And just three years ago, this technology took the scientific world by storm.

It's evolving very quickly and it's very exciting for scientists, and I admit I'm fascinated by it, and we're using it in our own lab, so I think someone will go a step further and continue to study GM human embryos, perhaps making designer babies.

It's everywhere now.

It just came out 3 years ago.

Thousands of labs now literally have this in their hands, doing important research.

Most of them are not interested in designer babies.

They study human disease and other important scientific factors.

As such, there is a lot of good research going on around CRISPR.

And the fact that genetic modification that used to take years and cost millions of dollars can now be done in weeks for thousands of dollars is great for me as a scientist, but it also opens the door for people who have gone too far.

And I suspect that for some, there will be less focus on science.

That's not what drives them.

It will be the pursuit of ideology and profit.

And they're going for designer babies.

So why should we worry about this?

If we go back two centuries, we know thanks to Darwin that evolution and genetics have had a huge impact on humankind today.

And some people think that there is something like social Darwinism at work in our world, and maybe even eugenics.

Imagine these trends and forces in this CRISPR technology booster rocket, so powerful and ubiquitous.

In fact, to see the power of eugenics, you can go back just over a century into the last century.

So my father, Peter Knopler, was actually born here in Vienna.

He is Viennese and was born here in 1929.

And the world was completely different when my grandparents had little baby Peter. right?

Vienna was different than usual.

The United States was different.

The world was different.

Eugenics was on the rise, and I think my grandparents realized pretty quickly that they were on the wrong side of the eugenics equation.

And even though this is their home, home for the whole extended family, and this area has been their family home for generations, they decided that because of eugenics, they had to move away.

And although they survived, they were heartbroken. I don't know if my father really recovered from leaving Vienna.

He left home in 1938 when he was just eight years old.

So today I see a new eugenics springing to the surface.

It should be kinder, gentler, positive eugenics, different from everything in the past.

But even though it's focused on trying to improve people, I think it can have negative consequences. And it really worries me that some of the top proponents of this new eugenics think CRISPR is the ticket to making it happen.

So I have to admit, eugenics, we are talking about making better humans.

That's a tough question.

What is better when we are talking about humans?

But I think most of us can probably agree that humans could do a little better.

Look at the politicians here, go back to America. God forbid going there now.

Maybe there's a way to think that you could be better just by looking in the mirror.

To be honest, you may wish you had more hair instead of baldness.

Some may wish they were taller, or a different weight, or a different face.

If we could do those things, if we could make those things happen, or let our children do them, that would be very attractive.

But it also comes with risks.

We talked about eugenics, but there are risks for individuals too.

So if we forget to enhance people and are just trying to use genetic modification to make them healthier, this technology is so new and so powerful that we could accidentally make people sick.

It can easily happen.

And there is another risk. It means that all legitimate and important genetic engineering research is done exclusively in laboratories. Again, I'm not interested in designer babies. If a few take the designer baby path, the whole field can be damaged if things go wrong.

I also think it's not very likely that governments will start to take an interest in GMOs.

So, for example, if there's a generation where our imaginary GM Jenna kids look healthier and health care costs less, it's possible that governments will start trying to force the public down the GM path.

Look at China's one-child policy.

It is believed that this prevented the birth of 400 million people.

Therefore, it is not beyond the realm of possibility that genetic modification will be promoted by the government.

And in our digital age, when designer babes become popular with viral videos and social media, what happens when designer babes are considered fashionable and become the new sparkly person, the new Kardashian family, etc.?

(Laughter.) You know, can we really control these trends?

I am not sure if I can do it.

Again, today is Halloween. When talking about genetic modification, there are characters that are talked about and called out in relation to Halloween more than anything else. That's Frankenstein.

Mainly Frankenfoods and everything else.

But if we think of this now in the human context of a day like Halloween, are we talking about a situation like Frankenstein 2.0 if parents are essentially genetically able to dress their children in costumes?

i don't think so. I don't think it will be that extreme.

But I think all bets are off when it comes to what happens when we try to hack human code.

There will still be danger.

And we can look back in time at other elements of transformative science to see how they basically spiral out of control and permeate society.

One example is in vitro fertilization.

Almost exactly 40 years ago, Test Tube Baby No. 1 Louise Brown was born. It's been great and I think 5 million IVF babies have been born since then and it's brought me immeasurable happiness.

Many parents are now able to love such children.

But when you think about it, it's pretty amazing that 5 million babies will be born from new technology in 40 years, and the same could happen with genetically modified humans and designer babies.

So, depending on the decisions we make in the coming months, next year or so, designer baby number one could result in millions of genetically modified humans within decades.

And there are differences, too. Because if we, you in the audience, or I decide to have designer babies, those children will also be genetically modified. because it is hereditary.

That's a big difference.

With all this in mind, what should we do?

Actually, the conference will be held in Washington D.C. one month from tomorrow.

It was founded by the National Academy of Sciences to address just that question.

What is the correct path forward for human genetic modification?

I think a pause is needed at this time.

We must ban this.

Creating genetically modified humans is too dangerous and unpredictable and should not be allowed.

But there are a lot of -- (Applause) Thank you.

(Applause.) And let me tell you, as a scientist, science in general doesn't like things like self-regulation, so I'm a little scared to say that in public.

So I think we have to put this on hold, but there are a lot of people who not only disagree with me, but feel the exact opposite.

They're like, step on the gas and go full speed ahead and make designer babies.

As such, it is very likely that the December meeting, and others scheduled in the coming months, will not be subject to a moratorium.

And I think part of the problem we have is that all this trend, the genetic engineering revolution as it applies to humans, is not known to the general public.

No one is saying, "This is a big deal, this is a revolution, and this can affect you very personally."

So part of my goal is to really change that, educate and engage the public and get you guys talking about this.

Therefore, I hope that the general public will have a role to play in these conferences as well.

So, if we go back now to 2030 again, and that imaginary story, and depending on the decisions we make, we literally don't have much time today, but in the coming months, next year or so, this technology is spreading like wildfire.

Let's return to that reality.

We are in the park and the kid is on the swing.

Is that child a normal child or did we decide to have a designer baby?

And let's say we're following some kind of traditional route and the kid is on a swing. Frankly, they're kind of confused.

Their hair is all over the place, just like mine.

They have stuffy noses.

They are not the best students in the world.

It's cute and I love it, but my best friend on the swing next to me is a GM kid, and when the two of us are swinging like this, we can't help but compare, right?

And GM kids swing higher, look better, get better grades, and don't have stuffy noses to wipe.

How does that make you feel? What decisions might you make next time?

thank you.

(applause)

Just look around the room and find the most paranoid person here -- (Laughter) and then I'd like you to point to that person.

(Laughter) Okay, don't actually do it.

(Laughter) But as an organizational psychologist, I spend a lot of time at work and find paranoia everywhere.

Paranoia is caused by people I call "takers."

Takers are selfish in dialogue.

It's all about what you do for me.

Its opposite is a giver.

In most interactions, it's the person who asks, "What can I do for you?"

I wanted to create an opportunity to think about my own style.

We all have our give and take moments.

Your style is mostly how you treat most people and is your default.

Take this quick test to determine if you're a giver or a taker.

[The Narcissist Test] [Step 1: Take a moment to think about yourself. ] (laughter) [Step 2: If you get to step 2, you are not a narcissist. [Laughter] That's all I'm going to say today, I don't have any data to back it up, but I'm pretty sure the longer it takes you to laugh at this cartoon, the more we need to worry about you being a taker.

(Laughter) Of course, not all takers are narcissists.

Some givers just suffered multiple burns.

And there's another kind of taker that we won't cover today, called a psychopath.

(Laughter) But I was curious about how common these extremes were, so I surveyed over 30,000 people in different industries and cultures around the world.

And it turns out that most people are right in the middle between giving and taking.

They choose this third style called "matching".

If you are a matcher, try to keep an even balance of give and take. In other words, give back -- if you do something for me, I will do something for you.

And it seems like a safe way to live your life.

But is it the most effective and productive way to live your life?

The answer to that question is very clear...

perhaps.

(Laughter) I've studied dozens of organizations, thousands of people.

We had engineers measure productivity.

(Laughter) I looked at medical student grades. We also looked at the income of salespeople.

(Laughter) And, unexpectedly, the worst performers in each of these jobs were the givers.

The engineers who did the least work were those who gave more than they got in return.

They were so busy doing other people's work that they literally ran out of time and energy to complete their own work.

In medical school, the students who most strongly agree with statements like "I love helping people" perform the worst. This suggests that the doctors to be trusted are those who come to medical school with no desire to help anyone.

(Laughter) And on the sales side, the most generous salespeople earned the lowest.

I actually reached out to one of the salespeople who had a very high giver score.

And I asked him, 'Why is your job so boring?'

And he said, "I care about my customers so much that I will never sell our poor products."

(Laughter) So, just out of curiosity, how many of you would consider yourself more of a giver than a taker or matcher?

Please raise your hand.

Well, I should have said more before talking about these data.

But in practice it turns out that there is a twist here. Givers often sacrifice themselves because they make the organization better.

We have an enormous amount of evidence, numerous studies looking at the frequency of giving behaviors that exist within teams and organizations, and the more often people help, share knowledge, and provide guidance, the better organizations perform in all measurable metrics: increased profits, customer satisfaction, employee retention, and even lower operating expenses.

So givers spend a lot of time helping others and improving their teams, but unfortunately, suffer along the way.

I want to talk about what it takes to build a culture where givers actually succeed.

So I wondered, if the givers are the worst performers, who will be the best performers?

Let's start with the good news. It's not the taker.

At most jobs, takers tend to be promoted quickly, but they also tend to drop quickly.

And they fall into the hands of matchers.

If you're a matcher, you believe in an eye for an eye, a just world.

So when I meet a taker, it feels like my life's mission to punish him or her downright.

(Laughter.) That's how justice is done.

Well, most people are matchers.

This means that if you are a taker, you tend to catch up eventually. What spins will spin.

So the logical conclusion is: It must be the matcher that performs best.

But it's not.

In all the work, in all the organizations I have studied, the best results are those who give again.

Let's take a look at the data I've gathered from hundreds of sales reps that track their revenue.

What we can see from this is that the giver acts on both extremes.

They make up the majority of the lowest earners, but they are also the highest earners.

The same pattern applied to engineer productivity and medical student performance.

For every success metric I can track, donors dominate both the bottom and the top.

This raises the following questions. How do we build a world where more of these givers can thrive?

I want to talk about how to make it happen not only in companies, but also in nonprofits, schools, and even governments.

are you ready?

(Cheers) I was going to do it anyway, but I appreciate the enthusiasm.

(Laughter) The first thing that's really important is to realize that your givers are the people you value most, but they'll burn out if they're not careful.

Therefore, you must protect the giver within you.

And I learned a great lesson about this from one of Fortune's best networkers.

It's a man, not a cat.

(Laughter) His name is Adam Rifkin.

He is a highly successful serial entrepreneur who spends an enormous amount of time helping others.

And his secret weapon is five minutes of goodwill.

Adam said, "You don't have to be Mother Teresa or Gandhi to be a giver.

Find small ways to add great value to other people's lives. ”

It could be as simple as making an introduction between two people who would benefit from getting to know each other.

You can also consider sharing your knowledge or giving a little feedback.

Or it might even be something as basic as, "Hey, I'm going to try and see if I can recognize someone whose work didn't get noticed."

And these 5 minutes of goodwill are so important for donors to set boundaries and protect themselves.

Second, if you want to build a culture in which givers succeed, you really need a culture in which asking for help is the norm. A place people often ask.

This might be a little too familiar for some.

[So in every relationship you have to always be the giver?] (Laughter) What you see in successful givers is that they recognize that it's okay to be the receiver.

If you run an organization, you can actually do this easily.

You can make it easier for people to ask for help.

A few colleagues and I studied hospitals.

We found that nurses on certain floors asked for help more frequently, while on other floors they rarely asked for help.

A striking factor on the floor where asking for help was common and the norm was that there was only one nurse whose only job was to help other nurses on the ward.

When given the role, the nurses said, "There's no shame in asking for help. It's not defenseless to ask for help. In fact, it's encouraged."

Asking for help isn't just important to protect the success and well-being of the giver.

It's also important to get more people to act like donors. Data shows that 75-90% of donations within an organization originate from a request.

But many people don't ask.

I don't want to look incompetent, I don't know where to turn, I don't want to be a burden on others.

But even if no one asked for help, there are plenty of frustrated givers in the organization who would be willing to step up and contribute if only they knew how they could benefit.

But if you want to build a culture of successful givers, I think the most important thing is to be thoughtful about who you add to your team.

I thought if we wanted a culture of productive generosity, we should hire a lot of donors.

However, I was surprised to discover that it was not actually true. The taker's negative impact on the culture is typically two to three times the giver's positive impact.

Think of it this way. 1 bad apple can spoil 1 barrel, but 1 good egg can't make 12 eggs.

I don't know what that means -- (laughter) but I hope so.

No, if you have even one taker on your team, you know the giver won't help.

They will say, "I am surrounded by many snakes and sharks.

Why should I contribute? ”

On the other hand, having one donor on your team won't give you an explosion of generosity.

A lot of the time, people will be like, "Wow, he'll do all the work for us."

Effective recruiting, selection, and team building are therefore not about bringing givers. It is to eliminate takers.

If you can do that, you're left with only givers and matchers.

Givers don't have to worry about the consequences, so they become generous.

And the great thing about matchers is that they follow the norm.

So how do you catch a taker before it's too late?

We're actually pretty bad at figuring out who's going to be a taker, especially on first impressions.

There are personality traits that let us down.

It's called sympathy, and it's one of the main aspects of personality across cultures.

Cheerful people are warm and friendly, helpful and polite.

Canada has a lot of them -- (Laughter) There actually was a national contest called "As Canadian as..." to come up with new Canadian slogans and fill in the blanks.

I thought the winning entry would be "Canadian as Maple Syrup" or "...Ice Hockey".

But it's not. Canadians voted for a new national slogan – no kidding – “Be as Canadian as possible under the circumstances.”

(Laughter) Well, if you're very empathetic, or a little bit Canadian, you'll get it right away.

How can you say you are one when you are always trying to please others?

Obnoxious people don't do that often.

They are more critical, skeptical, defiant, and far more likely to go to law school than other people.

(Laughter) It's not a joke, it's actually an empirical fact.

(Laughter) So I always thought that the good guys were the givers and the bad guys were the takers.

However, when I collected the data afterwards, I was stunned to find no correlation between those features. Because it turns out that likes and dislikes are your appearance: "How much fun do you have with me?"

On the other hand, the give and take is your inner motivation, what are your values? What are your intentions for others?

If you really want to accurately judge a person, you should go to the moment when all the consultants in the room are waiting and draw two by two.

(Laughter) A good giver is easy to spot. They answer "yes" to everything.

The obnoxious Taker may also be called by a slightly different name, but you'll know it right away.

(Laughter) I forgot about the other two combinations.

We have obnoxious givers in our organization.

On the surface, there are people who are blunt and tough, but deep down, they put the interests of others first.

Or, in the words of an engineer, "Oh, the obnoxious giver. It's like someone with a bad user interface but a great operating system."

(laughs) I hope it helps you.

(Laughter) Obnoxious givers are the most underrepresented people in organizations because they're the ones who give important feedback that no one wants to hear but everyone needs to hear.

We need to do a better job of valuing these people instead of dismissing them early and saying, "Well, they must be kind of nasty and selfish."

Another combination we tend to forget is the lethal combination. It is also known as a favored taker or faker.

This person is ostensibly gentle and will quickly stab you in the back.

(Laughter) And my favorite way to get these people in the interview process is to ask them, "Can you name four people who have radically improved their careers?"

Takers give you four names, but they're all more influential than you because Takers are good at kissing and then kicking you down.

Givers are more likely to nominate people below them in the hierarchy, those who are less powerful, and those who are of no use to them.

Let's be honest, we all know that you can learn a lot about your character by watching how you treat a restaurant server or an Uber driver.

So if we can do all of this well, if we can keep takers out of our organization, if we can feel safe asking for help, if we can protect givers from burnout, and if they are okay with being ambitious not just helping others but pursuing their own goals, then we can really change the way people define success.

Instead of people saying it's all about winning the competition, you'll realize that success is actually about contribution.

I believe the most meaningful way to be successful is to help others succeed.

And if you can spread that belief, you can really turn the paranoia on its head.

it has a name.

It's called a "pronoia".

Pronoia is the delusional belief that others are planning your well-being.

(Laughter) That they go around behind your back and say very bright things about you.

The great thing about the culture of giving is that it's a reality, not an illusion.

I want to live in a world where givers succeed. We would love to help you create that world.

thank you.

(applause)

Growing up in Kenya, I always wanted to study biochemistry.

I had seen the effects of the spread of diseases like malaria and wanted to create medicines to cure them.

So I worked hard and won a scholarship to go to the United States and become a cancer researcher there. And I loved the United States.

For those who want to cure disease, there is no better mission.

Ten years later, I returned to Kenya to do just that.

The newly established doctorate is ready to tackle this dreaded disease that is almost certainly a death sentence in Kenya.

But instead of working for a pharmaceutical company or a hospital, I became drawn to different kinds of laboratories that work with different kinds of patients. Patients who need to get well soon.

That patient was my government.

(Laughter) You see, many of us would agree that many governments today are unsound.

(Laughter.) (Applause.) And Kenya was no exception.

When I returned to Kenya in 2014, the youth unemployment rate was 17 percent.

Nairobi, a major business center, was also rated 177th on the Quality of Life Index.

It was bad.

Now, the health of an economy is determined by the entities that make it up.

Therefore, when government, one of the most important organs of government, is weak or unhealthy, everyone and everything suffers.

In some cases, a band-aid may be applied to temporarily relieve the pain.

Perhaps some of you here have participated in Band-Aid activities (establishing alternative schools, building hospitals, digging wells) in African countries. Because the government of that country did not or could not provide services to its citizens.

We all know this is a temporary solution.

There are some things that Band-Aids can't solve. For example, providing an environment where companies can rest assured that they have an equal chance to do business and start a business.

Alternatively, a system is in place to protect the private property they create.

Only governments, I argue, can create the conditions necessary for an economy to thrive.

The economy thrives when businesses can set up stores quickly and easily.

Business owners create new revenue streams for themselves, new jobs are added to the economy, and more taxes are paid to fund public works.

New business is good for everyone.

And it's such an important measure of economic growth that the World Bank produces a ranking called the 'Ease of Doing Business Ranking' that measures how easy or difficult it is to start a business in a particular country.

And as you can imagine, it's nearly impossible to start or run a business in a country with an ailing government.

The President of Kenya knew this, so he came to our lab in 2014 and asked us to work together to accelerate business growth in Kenya.

He set ambitious goals. We wanted to rank Kenya in the top 50 in the World Bank rankings.

In 2014, when he came, Kenya was ranked 136th out of 189 countries.

A job was prepared for us.

Luckily he came to the right place.

We are more than just a Band-Aid team.

We were a group of computer scientists, mathematicians, engineers, and cancer researchers who knew that to cure a disease as large as our government, we needed to examine the whole body, going from organ to tissue to single cell in order to be able to make a proper diagnosis.

So, with a marching order from the President himself, we embarked on the purest scientific method. It's about collecting data—all the data we have available, making hypotheses, and generating solution after solution.

So we met with hundreds of people working in government agencies, including tax offices, land administrations, utility companies, and agencies responsible for company registration, to observe how they serve their clients and document their processes. Most of that process was manual.

We also went back in time and looked at a lot of paperwork to really understand. An attempt was made to diagnose the physical abnormality that caused him to be ranked 136th on the World Bank list.

what did we find?

In Kenya it took a business owner 72 days to register a property compared to just 1 day in New Zealand, which ranks second on the World Bank list.

It took 158 days to establish new electrical connections.

It took 18 days in Korea.

In Kenya it takes 125 days if you want to get a building permit to build a building.

In Singapore, which ranks first, it takes only 26 days.

God forbid you have to go to court to settle a dispute to enforce a contract. That process alone takes 465 days.

And if that's not bad enough, you'll lose 40 percent of your claim just in fees like litigation costs, enforcement costs, and court costs.

Okay, I know what you're thinking. For such inefficiencies to exist in an African country, there must be corruption.

The very cells that run the show must be rotten to the bone.

I actually thought so too.

When we started out, I thought I would discover too much corruption, literally die or be killed in the process.

(Laughter) But when I looked deeper, I didn't find corruption in the classical sense. A slimy gang lurked in the dark, waiting to grease the palms of their friends.

What we felt was an overwhelming sense of helplessness.

Our government was sick because government officials felt helpless.

They felt they had no authority to drive change.

And when people feel stuck and helpless, they stop seeing their role in the larger system.

They begin to think their work is not important in driving change.

When that happens, things slow down, cracks creep in, and inefficiencies run rampant.

Now imagine that there was a process you had to go through, you had no other choice, and the process was inefficient, complicated, and very time consuming.

what would you do?

First of all, why don't you start by looking for a contractor who will outsource it and have them do it instead?

If that doesn't work, you might consider paying someone to "informally" handle it for you. Especially if you think no one will catch you.

Not out of malice or greed, just trying to make sure you get something that will help you move on.

Unfortunately, it is the beginning of corruption.

And if you allow it to multiply and grow, it will permeate your entire body and before you know it, your entire body will be sick.

Recognizing this, we needed to start by making sure all the parties we worked with had a shared vision of what we wanted to do.

There, we met with everyone from clerks whose sole job was removing staples from packets of applications, to law drafters in the Attorney General's Office, to clerks responsible for dealing with business owners who came to use government services.

And we worked with them to help them understand how their daily actions impacted our ability as a nation to create new jobs and attract investment.

No one role was too small. Everyone's role was important.

So what do you think we're starting to see?

A coalition of government workers excited and ready to drive change began to grow and form.

Together, we have begun implementing changes that affect our service delivery.

result?

In just two years, Kenya's ranking has risen from 136th to 92nd.

(Applause.) And for the second year in a row, Kenya was named among the world's top three global reformers in recognition of the significant reforms we were able to implement in such a short period of time.

(Applause.) Are we perfectly healthy?

no.

We still have some important work to do.

I like to think of these two years like a weight loss program.

(Laughter) After months of hard, grueling training at the gym, when I weighed myself for the first time, I had lost 20 pounds.

I feel unstoppable.

Now, some of you may think this is not the case for you.

You are not from Kenya.

You are not going to be an entrepreneur.

But let's think about it together for a moment.

When was the last time you accessed a government service?

You may have applied for a driver's license or tried to pay your own taxes.

In this political economy and global economy, it's easy to be tempted to give up when you think of government changes.

We can easily accept the facts and beliefs that our governments are too inefficient, too corrupt, and beyond repair.

We may even just give up and feel helpless, with little to no significant government responsibility for other fields or band-aid solutions.

But just because a system has a problem doesn't mean it stops.

On the task of rebuilding our government, we cannot afford to give up.

Ultimately, what makes government truly healthy is when healthy cells — you and I — keep our feet on the ground, roll up our sleeves, refuse to be powerless, and sometimes believe that all it takes is to create space for healthy cells to grow and thrive.

thank you.

(applause)

There is something about physics that has fascinated me since I was a child.

And it relates to an unanswered question that scientists have been asking for almost 100 years.

How do the smallest things in nature, the particles of the quantum world, match up with the largest things in nature: the planets, stars, and galaxies held together by gravity?

As a child, questions like this puzzled me.

We played around with microscopes and electromagnets, read about small forces and quantum mechanics, and were amazed at how well the descriptions matched our observations.

Then I looked at the stars, read about how well we understood gravity, and thought there must be some elegant way to reconcile these two systems.

But it's not.

And the book says, "We understand a lot about these two areas separately, but when we try to combine them mathematically, it all breaks down."

And for 100 years, none of our ideas on how to solve this basically physical disaster have been backed up by evidence.

And to old me--little, curious, skeptical James--this was the most unsatisfying answer.

So I'm still a skeptical kid.

Flash forward to December 2015 and I found myself on the verge of turning the physics world upside down.

It all started when CERN saw something interesting in the data. It's a hint of a new particle and perhaps a surprising answer to this question.

So I guess I'm still a skeptical kid, but now I'm also a particle hunter.

I am a physicist at CERN's Large Hadron Collider, the largest scientific experiment ever installed.

A 27-kilometer tunnel buried 100 meters underground on the French-Swiss border.

And this tunnel uses superconducting magnets that are cooler than the universe to accelerate protons to nearly the speed of light, bombard them millions of times per second, and collect the debris from these collisions in search of new, undiscovered elementary particles.

Its design and construction have taken decades of work by thousands of physicists from around the world, and in the summer of 2015 we worked tirelessly to switch on the LHC with the highest energy humans have ever used in a collider experiment.

Now, the reason higher energies are important is that for particles there is an equivalence between energy and the mass of the particle, and mass is just a number that is naturally given there.

To discover new particles, we need to reach these larger numbers.

To do that, we need to build a larger, higher-energy collider. The world's largest and most energetic collider is the Large Hadron Collider.

It then collides protons thousands of times and collects this data very slowly over many months.

And new particles can appear in the data as bumps. This is a small deviation from what you would expect, a small cluster of data points that make the smooth line less smooth.

For example, this uplift, after months of data collection in 2012, led to the discovery of the Higgs boson (Higgs Boson), and the Nobel Prize for confirmation of its existence.

This energy surge in 2015 was nearly double the energy we used when we discovered the Higgs boson, so it represented our best chance ever as a species to discover a new particle—a chance to discover new answers to these long-standing questions.

Many of my colleagues have devoted their entire careers to this moment, but frankly, for me with little interest, this was the moment I've been waiting my whole life for.

So 2015 was the perfect time.

So in June 2015, the LHC will be switched on again.

My colleague and I held our breath and bit our nails as we finally witnessed the first proton collision at this all-time high energy.

Applause, champagne, celebration.

This was a scientific breakthrough, but we had no idea what to expect from this brand new data.

And after a few weeks, I discovered a bump.

It wasn't that big of a bump, but it was big enough to raise an eyebrow.

However, on a scale of 1 to 10 for eyebrow raise, this eyebrow raise is about 4, where 10 indicates that we have found a new particle.

(Laughter.) I spent hours, days, weeks in secret meetings, arguing with my colleagues about this little protuberance, poking and poking with the most ruthless laboratory sticks to see if it could stand up to scrutiny.

But even after months of working furiously, sleeping in the office and not coming home, candy bars for dinner, and buckets of coffee, physicists are machines that turn coffee into figures (laughs).

So, a few months later, we presented this little bump to the world with a very clear message. This small bump is interesting, but not conclusive, so let's keep an eye on it as we get more data.

So we were trying to be very calm about it.

And the world ran with it anyway.

The news was well received.

People said it reminded them of the small bumps shown en route to the discovery of the Higgs boson.

More than that, my theoretic colleagues, I love my theoretic colleagues. My theoretician colleague has written 500 papers on this little problem.

(Laughter) The world of particle physics has turned upside down.

But what was this particular shock that caused thousands of physicists to collectively lose their cool?

This small unevenness was unique.

The small bump was an unexpectedly large number of observed collisions, indicating that the fragment consisted of just two photons, or two particles of light.

And that is unusual.

Particle collisions are different from car collisions.

they have different rules.

When two particles collide at nearly the speed of light, the quantum world takes over.

And in the quantum world, these two particles can briefly produce new particles that live for just a second before splitting into other particles that hit the detector.

Imagine a car crash. When they collide, the two cars disappear and the bike appears -- (Laughter) and then the bike explodes into two skateboards and hits our detector.

(Laughter.) I hope it's not literal.

Very expensive.

Events where only two photons hit the detector are extremely rare.

And due to the special quantum properties of photons, very few new particles (these mythical bicycles) could potentially produce only two photons.

But one of those options is pretty big, and it concerns a long-standing question that has haunted me since childhood: gravity.

Gravity may seem very strong, but it is actually frighteningly weak compared to other forces of nature.

You can temporarily overcome gravity when jumping, but you can't take protons out of your hands.

How strong is gravity compared to other natural forces?

10 vs minus 39.

This is a decimal number followed by 39 zeros.

Worse than that, all other known forces of nature are completely described by what we call the Standard Model. It is the best current description of nature on the smallest scale and, frankly, one of mankind's most successful achievements. None exist in the standard model, except for gravity.

it's crazy.

It's as if most of the gravity is gone.

We feel it a little bit, but where's the rest?

nobody knows

But one of the theoretical explanations suggests an outrageous solution.

You and I, including you behind us, live in a three-dimensional space.

I hope it's an uncontroversial statement.

(Laughter) All known particles also exist in three-dimensional space.

In fact, particles are just another name for excitations in the 3D field. Local wobble in space.

More importantly, all the math we use to explain all this assumes that space only exists in three dimensions.

But math is math, and you can play around with math any way you like.

And while people have been playing with the extra dimensions of the universe for a very long time, it has always been an abstract mathematical concept.

So look around -- you in the back, look around -- space is obviously only three dimensional.

But what if that's not true?

What if the lost gravity is leaking into another dimension that you and I can't see?

If you look at gravity in a dimension outside of this space, what if gravity is as strong as any other force, and what you and I are experiencing is just a fraction of gravity appearing to make gravity look very weak?

If this is true, then the standard model of particles should be extended to include additional particles, hyperdimensional particles of gravity, and special gravitons that exist in dimensions outside space.

I can see your facial expressions.

You're asking me, "How the hell are we going to test this crazy sci-fi idea that's stuck in 3D?"

The way we've always done it is by making two protons collide -- (laughter) so violently that the collision is so violent that it reverberates through every extradimensional dimension that might be there, and then it instantly creates this hyperdimensional graviton, then snaps back into the third dimension of the LHC, exhaling two photons, two particles of light.

And this hypothetical extradimensional graviton is one of the only possible hypothetical new particles with special quantum properties that could give birth to our tiny two-photon bump.

So the possibility of explaining the mysteries of gravity and discovering extra dimensions of the universe, perhaps this explains why thousands of physics geeks collectively lost their cool over our tiny two-photon collision.

Findings of this sort would rewrite textbooks.

But remember, the message from us experimenters who were actually doing this research at the time was very clear. We need more data.

With more data, small bumps will either turn into wonderfully sharp Nobel-like things -- (Laughter), or the extra data will fill in the space around the bumps and turn them into wonderfully smooth lines.

So we got more data, and after a few months we had five times as much data, and the small bumps turned into smooth lines.

The news reports of "great disappointment", "fading hopes" and "grief" among particle physicists.

Given the tone of the press, you would think we had decided to close the LHC and go home.

(Laughter) But that's not what we did.

But why not?

I mean, if I didn't discover the particle, and I didn't discover it, but I didn't discover the particle, why am I here talking to you?

Why didn't I bow my head in shame and go home?

Particle physicists are explorers.

And most of what we do is mapping.

Let me tell you, forget about the LHC for a second.

Imagine that you are a space explorer who has arrived on a distant planet in search of aliens.

What is your first job?

It immediately orbits the planet, lands, scans its surroundings for any large, obvious signs of life, and reports back to its home base.

That's where we are now.

We first looked at the LHC for new large particles and were able to report none.

I saw a strange-looking alien bump on a mountain in the distance, but when I got closer, I realized it was a rock.

But what then? Will you give up and fly away?

Absolutely not; we would be terrible scientists if we did.

No, we will spend the next few decades exploring, mapping our territory, sifting sand with fine tools, peering under every stone, and drilling below the surface.

New grains may appear immediately as large, noticeable bumps, or they may only appear after years of data acquisition.

Humanity has just begun exploring this large, high-energy LHC, and there is much work to be done.

But what happens if no new particles are found 10 or 20 years from now?

We build bigger machines.

(Laughter) We look for higher energies.

We explore with higher energies.

Plans are already underway for a 100-kilometer tunnel that will collide particles with 10 times the energy of the LHC.

We do not decide where nature places new particles.

We just decide to keep exploring.

But what if after a 100-kilometer tunnel, a 500-kilometer tunnel, or a 10,000-kilometer collider in space between the Earth and the Moon, we still haven't found a new particle?

So maybe we're getting particle physics wrong.

(Laughter) Maybe we need to rethink things.

Perhaps we need more resources, technology, and expertise than we currently have.

We already use artificial intelligence and machine learning techniques in parts of the LHC, but imagine designing a particle physics experiment with advanced algorithms that could learn to find hyperdimensional gravitons.

But what if?

The Ultimate Question: What if even artificial intelligence couldn't answer our questions?

What if these unanswered questions are doomed to remain unanswered for centuries and for the foreseeable future?

What if the things that have haunted me since childhood were destined to never be answered in my lifetime?

Then it is...

It will make you even more attractive.

We will be forced to think in entirely new ways.

You have to go back to your assumptions and determine if something went wrong.

And because we need a fresh look at these century-old issues, we need to encourage more people to participate in the study of science.

I have no answer and am still searching.

But someone, maybe she's in school now, maybe she wasn't even born yet, will eventually lead us to look at physics in a whole new way, and maybe point out that maybe we're just asking the wrong questions.

It will not be the end of physics, but a new beginning.

thank you.

(applause)

Here are some amazing facts. In the 45 years since the introduction of automated teller machines, vending machines that dispense cash, the number of human bank tellers employed in the United States has roughly doubled, from about 250,000 to 500,000.

In 1970 there were 250,000, now there are about 500,000, and since 2000 there has been an increase of 100,000.

These facts, revealed in a recent book by Boston University economist James Bessen, raise interesting questions. “What the hell are those tellers doing, and why are they still out of work due to automation?”

Come to think of it, many of the great inventions of the last 200 years were designed to replace human labor.

Tractors were developed to replace human physical labor with mechanical power.

The assembly line was designed to replace inconsistent human manual work with machine perfection.

Computers are programmed to replace error-prone and inconsistent human calculations with digital perfection.

These inventions worked.

We no longer dig trenches by hand, hammer tools with wrought iron, or use physical books to do our bookkeeping.

Still, the percentage of U.S. adults employed in the labor market is higher today in 2016 than it was 125 years ago in 1890, and has increased nearly every decade for the intervening 125 years.

This creates a contradiction.

More and more machines are doing the work for us.

Why won't this make our labor redundant and our skills obsolete?

Why is there still so much work to do?

(Laughter) I'll try to answer that question tonight. Along the way, I'd also like to talk about what this means for the future of work, and the challenges automation poses to our society and the challenges it doesn't.

Why are there so many jobs?

In practice, two basic economic principles are at stake.

One has to do with human genius and creativity.

Another is about human insatiability, or greed.

Let's call the first of these the O-ring principle. This determines the kind of work we do.

The second principle, the not-enough-getting principle, determines how much work there really is.

Let's start with the O-ring.

ATMs, or automated teller machines, had two countervailing effects on bank teller employment.

As you can imagine, many teller operations have been replaced.

The number of counter staff per branch decreased by about one-third.

However, banks quickly realized that it would be cheaper to open new branches, and the number of bank branches increased by about 40% over the same period.

The net result was an increase in the number of branches and counters.

But those tellers worked a little differently.

As the daily routine of handling cash receded, they became less like cashiers and more like salespeople building relationships, solving problems, and introducing customers to new products such as credit cards, loans, and investments. More tellers are doing more cognitively demanding tasks.

Here are some general principles.

Most of the work we do, in the words of Thomas Edison, requires a range of skills, brains and brawn, technical expertise and intuitive mastery, sweat and inspiration.

In general, automating some of these tasks does not eliminate the need for others.

In fact, it makes them more important.

It increases economic value.

Let me give you a clear example.

In 1986, the space shuttle Challenger exploded and crashed to Earth less than two minutes after takeoff.

It turned out that the cause of the crash was a cheap rubber O-ring inside the booster rocket that had frozen on the launch pad the night before and catastrophically failed shortly after takeoff.

In this multi-billion dollar enterprise, that simple rubber O-ring made the difference between the mission's success and the tragic deaths of seven astronauts.

An ingenious metaphor for this tragic situation is the o-ring production function, named by Harvard economist Michael Kramer after the Challenger disaster.

The O-ring manufacturing function can be thought of as a series of interlocking steps, or operations linked in a chain.

All of these links must be preserved for the mission to succeed.

If any of them fail, the mission, product or service will collapse.

This precarious situation has surprisingly positive implications. That is, increasing the reliability of any link in the chain increases the value of improving any other link.

Specifically, if most of the links are brittle and prone to breakage, the fact that the links are not very reliable is less important.

Something else will probably break.

But as all other links become more robust and reliable, their importance becomes more important.

Within limits, everything depends on it.

The reason O-rings were important for the Space Shuttle Challenger was because everything else worked perfectly.

If the Challenger had been the space-age equivalent of Microsoft Windows 2000 -- (laughter) O-ring reliability wouldn't have been an issue. Because the machine would have crashed.

(Laughter) Here's the broader point.

In much of the work we do, we are the O-ring.

Sure, ATMs can perform certain cash-handling tasks faster and better than tellers, but that doesn't make tellers unnecessary.

That increased the importance of problem-solving skills and customer relationships.

The same principles apply whether you're building a building, diagnosing and caring for a patient, or teaching a roomful of high school students.

As our tools improve, technology expands our influence and increases the importance of our expertise, judgment and creativity.

So I come to the second principle. It's never enough.

You may be thinking, "O-rings, I get it. It means the work people do matters."

These cannot be done by machine, but they must still be done.

But that alone doesn't tell you how many jobs you'll need.

Come to think of it, isn't it kind of self-evident that once we've become sufficiently productive at something, we're basically out of work?

In 1900, 40 percent of all U.S. employment was on farms.

Today that percentage is less than 2%.

Why are there so few farmers now?

It's not because I'm eating less.

(Laughter.) A century of increased agricultural productivity has now enabled millions of farmers to feed a population of 320 million people.

This is amazing progress, but it also means that there are very few o-ring jobs left in agriculture.

It is clear that technology can cause job losses.

Agriculture is just one example.

There are many other similar ones.

But what's true about a single product, service, or industry is never true about the economy as a whole.

Many of the industries we work in today, such as health and medicine, finance and insurance, electronics and computing, were small or non-existent a century ago.

Many of the products we spend a lot of money on, such as air conditioners, sport utility vehicles, computers, and mobile devices, are either too expensive or weren't invented a century ago.

As automation frees up time and expands the scope of what we can do, we invent new products, new ideas, and new services that capture our attention, occupy our time, and stimulate our consumption.

You might think some of these things are frivolous, like extreme yoga, adventure tourism, Pokémon GO, and I might agree with you.

But people want these things and are willing to work for them.

If the average worker in 2015 wanted to reach the average standard of living in 1915, he or she would only need to work 17 weeks, one-third of the year.

But most people don't choose it.

They work hard to reap the technological bounty available to them.

Material abundance did not make up for the feeling of scarcity.

In the words of economist Thorstein Veblen, invention is the mother of necessity.

now ...

So if you accept these two principles, the O-ring principle and the never-sufficient principle, you agree with me.

You will also have a job.

Does that mean you don't have to worry about anything?

Automation, jobs, robots, and jobs -- will it all work itself out?

no.

That's not my point.

Automation creates wealth by enabling you to do more in less time.

There are no economic laws to put that wealth to good use, and it's worth worrying about.

Consider two countries, Norway and Saudi Arabia.

Both oil-rich countries are like gold gushing out of a hole in the ground.

(Laughter.) But they have equally poorly used that wealth to promote human prosperity, human prosperity.

Norway is a country with a thriving democracy.

In general, residents work and play together.

It typically ranks between 1st and 4th in national happiness rankings.

Saudi Arabia is an absolute monarchy and many citizens have no avenues of personal advancement.

Happiness usually ranks 35th among countries, a low number for a country this wealthy.

For comparative purposes, the United States is usually ranked around 12th or 13th.

The difference between the two countries is neither wealth nor technology.

It's their organization.

Norway has invested in building a society of opportunity and economic mobility.

Saudi Arabia has improved its standard of living while frustrating many other human endeavors.

Both countries are wealthy, but they are not equally wealthy.

And this brings me to the challenges we face today, the challenges automation poses to us.

The challenge is not that jobs will disappear.

The US has added 14 million jobs since the depths of the Great Recession.

The challenge is that many of those jobs are not good jobs, and many citizens are ill-qualified for the good jobs that are being created.

Employment growth in the United States and much of the developed world is like increasing the weight on each end of a barbell.

On the other hand, there are highly educated and well paid jobs such as doctors and nurses, programmers and engineers, marketing and sales managers.

Employment is strong and growing in these occupations.

Similarly, employment growth is strong in many low-skilled and less educated jobs such as food service, cleaning, security and home health care assistance.

At the same time, employment is declining in many middle-educated, middle-wage, middle-class jobs, including blue-collar production and labor jobs, and white-collar clerical and sales jobs.

It's no wonder the reason behind this midsection contraction.

Many of these intermediate-skill jobs use well-understood rules and procedures, which are codified in software and increasingly performed by computers.

The challenge posed by this phenomenon, which economists call employment polarization, is that it threatens to break down the economic hierarchy, shrink the size of the middle class, and make society more stratified.

On the one hand, there are highly paid, well-educated professionals doing interesting work, while on the other hand, there are a large number of citizens in low-paying jobs whose primary responsibility is to look after the well-being and health of the wealthy.

That's not my vision of progress, and I doubt it's yours.

But here's some encouraging news.

We have faced equally significant economic transformations in the past and have navigated them successfully.

Remember that tractor in the late 1800s and early 1900s, when automation was wiping out vast numbers of agricultural jobs? --The farming states are facing the threat of mass unemployment, spawning a generation of young people who are no longer needed on farms but are not industrially ready.

Faced with this challenge, they have taken drastic steps to require that all young people continue to attend school and continue their education until the ripe old age of 16.

This was called the High School Movement, and it was very expensive.

Not only did we have to invest in schools, our children couldn't get jobs.

It also turned out to be one of the best US investments of the 20th century.

This has resulted in the most skilled, most flexible and most productive workforce in the world.

To see how well this worked, imagine bringing the workforce of 1899 into the modern era.

Many of them, despite their strong backs and good personalities, lack basic reading, writing and arithmetic skills to do all but the most mundane jobs.

Many of them will be unemployed.

This example highlights the priority of our institutions, especially schools, in enabling us to enjoy the harvest of our technological prosperity.

It would be foolish to say that there is nothing to worry about.

Obviously, I could misunderstand this.

If America hadn't invested in schools and their skills with the high school movement a century ago, we would be a less prosperous, more fluid, and perhaps far less happy society than we are today.

But it is equally foolish to say that our destinies are predetermined.

It's not for the machine to decide.

It is not even determined by the market.

It is determined by us and our institutions.

Well, I started this story with a paradox.

More and more machines are doing the work for us.

Why would that make our labor and skills redundant?

Isn't it obvious that the road to our economic and social hell is paved by our own great inventions?

History has repeatedly provided answers to that contradiction.

The first part of the answer is that technology expands our influence, increasing the importance and added value of expertise, judgment and creativity.

That's the O-ring.

The second part of the answer means that our boundless ingenuity and bottomless desires will never get enough and never get enough.

New jobs are always waiting.

Adapting to the rapid pace of technological change creates real challenges, most notably in polarized labor markets and the threat they pose to economic mobility.

Meeting this challenge is not automatic.

It's not without costs.

It is not easy.

But it is doable.

And here's some encouraging news.

We are rich because of our amazing productivity.

Of course, we can afford to invest in ourselves and our children, just as America did 100 years ago with the high school movement.

Perhaps you can't help it.

Well, you might be thinking that Professor Autor has told us a heartwarming story about the distant past, the recent past, maybe the present, but maybe the future.

Because we all know this time is different.

right? Is it different this time?

Of course not this time.

It's different every time.

Many times over the past 200 years, scholars and activists have warned that we are out of work and becoming obsolete. US Secretary of Labor James Davis in the mid-1920s. Economist Vasily Leontief won the Nobel Prize in 1982. And, of course, so do many of today's academics, experts, engineers, and media people.

It seems to me that these predictions are arrogant.

These self-proclaimed oracles are in effect saying, "If I can't think of what people will do for work in the future, neither you nor I nor our children are going to think about it."

I do not dare to bet on human ingenuity.

You never know what people will do at work 100 years from now.

But the future is not up to my imagination.

If I were an Iowa farmer in 1900, and an economist from the 21st century teleported into my field and said, "Hey, what do you think, farmer autographer, in the next 100 years, farm employment will fall from 40 percent to 2 percent of total employment, simply because of productivity gains?

What do you think the remaining 38% of workers will do?”

I wouldn't have said, "Oh, I get this."

I will do app development, radiology, yoga instruction, and Bitmoji. ”

(Laughter) I wouldn't have had a clue.

But I wish I had the wisdom to say this.

That's an amazing amount of progress.

I hope that humanity finds something remarkable to do with its prosperity. ”

And by and large, I would say it did.

thank you very much.

(applause)

So when you stargaze at night, you can see amazing things.

beautiful.

But what is even more amazing is that it is invisible. Because what we currently know is that every star, or almost every star, has one, or perhaps several, planets around it.

Not in this picture are all the planets we know of in space.

But when we think of planets, we tend to think of things that are far away, very different from our planet.

But here we are on the planet, and there are so many amazing things on Earth that we are searching far and wide to find such things.

And when you search, you find amazing things.

But I want to tell you about something amazing here on Earth.

That means 400 pounds of hydrogen and almost 7 pounds of helium are escaping from Earth into space every minute.

And this is gas, and it goes away and doesn't come back.

Thus, hydrogen, helium, and many others make up what is known as the Earth's atmosphere.

The atmosphere is these gases that form the thin blue line. This is a photo taken by some astronauts as seen from the International Space Station.

And it is this tenuous surface around our planet that allows life to thrive.

It protects the earth from impacts such as meteorites.

And it's such an amazing phenomenon that the fact that it fades away should scare you at least a little.

This process is what I'm studying and it's called atmospheric escape.

Therefore, exodus is not unique to Earth.

If you ask me, it's part of what it means to be a planet. Because planets, not just here on Earth, but throughout the universe, have the potential to escape the atmosphere.

And how that happens actually tells us about the planet itself.

When you think of our solar system, you might think of this picture.

And you would say there are eight planets, maybe nine.

Add someone for anyone who is stressed looking at this photo.

(Laughter) I've also included Pluto, courtesy of New Horizons.

And the point here is, for the purposes of this story and the escape from the atmosphere, Pluto is a planet in my mind, just as the planets around other stars we cannot see are also planets.

Thus, basic characteristics of planets include the fact that they are celestial bodies held together by gravity.

In other words, many substances are simply stuck together by this gravitational force.

And these celestial bodies are very large and have a very large gravity.

That's why it's round.

So if you look at all of these, including Pluto, you'll see that it's round.

So you can see that gravity is really at work here.

But there is another fundamental feature about planets that we don't see here. It is the sun, the star around which all the planets of the solar system revolve.

And that's what's fundamentally driving the exodus.

Basically, the reason stars encourage the escape of planets into the atmosphere is that they provide planets with particles, light, and heat that can cause atmospheric extinction.

So if you think about hot air balloons, or look at pictures of lanterns at Thai festivals, you know that hot air can propel gas upwards.

And with enough energy and heat, that gas, like our Sun, is so light and bound only by gravity that it can escape into space.

And this is what actually causes the escape of the atmosphere here on Earth and on other planets, the interaction between heating from the stars and overcoming gravity on Earth.

So I said it happens at a rate of 400 pounds per minute for hydrogen and almost 7 pounds per minute for helium.

But what would it look like?

Well, even back in the 80's, NASA's Dynamic Explorer spacecraft was used to take pictures of the Earth in ultraviolet light.

So these two images of the Earth show what the escaping hydrogen glow, shown in red, looks like.

You can also see other features such as oxygen and nitrogen in the white glow in the circle, as well as the aurora borealis and some fog in the tropics.

So, I'd add, these pictures conclusively show that not only is our atmosphere firmly attached to us on Earth, but it's actually spreading out into space, and at an amazing speed.

But Earth isn't the only planet experiencing exodus.

Our closest neighbor Mars is much smaller than Earth, so it has much less gravity to maintain its atmosphere.

So it turns out that Mars has an atmosphere, but it's much thinner than Earth's.

just look at the surface.

The presence of craters indicates that there was no atmosphere to prevent the collision.

We also know that it is the "red planet" and atmospheric escape is responsible for Mars being red.

That's because Mars may have had a much wetter past, where when water had enough energy it split into hydrogen and oxygen, hydrogen being so light it escaped into space, and the remaining oxygen oxidized or rusted the ground, giving it that familiar rusty red color we see.

So it's okay to look at pictures of Mars and say that perhaps an escape has occurred, but NASA now has a rover on Mars called the MAVEN satellite, whose real job is to study escape.

It's the Mars Atmosphere and Volatile Evolution spacecraft.

And the results already show pictures very similar to what you see here on Earth.

We've known for some time that the atmosphere on Mars is disappearing, but there are some stunning pictures.

For example, here the red circle shows the size of Mars, and the blue shows hydrogen escaping from Mars.

So it has reached over ten times the size of the planet and has reached so far that it is no longer bound to it.

I'm running away into space

And this helps confirm ideas such as why Mars is red from lost hydrogen.

However, hydrogen is not the only gas lost.

We touched on helium, oxygen and nitrogen on Earth, but from MAVEN you can also see the oxygen lost from Mars.

Oxygen is heavier, so it can't reach as far as hydrogen, but it still keeps escaping from Earth.

Not everything is confined within that red circle.

Therefore, the fact that we can not only see the escape on our own planet, but study it elsewhere and send spacecraft, allows us to learn not only about the past of the planet, but also about the future of the planet in general and the Earth.

So one way we can actually learn about the future is from planets that are too far away for us to see.

But before that, please note that I'm not going to show you pictures of Pluto like this. Unfortunately, we don't have pictures yet.

But the New Horizons mission is currently studying atmospheric escapes that are lost from Earth.

Please pay attention and pay attention.

But the planets I wanted to talk about are known as transiting exoplanets.

Therefore, planets orbiting stars other than our Sun are called exoplanets, or exoplanets.

And these planets, which we call transits, have the special feature that if you look at the star in the middle, you can actually see that they are blinking.

And the reason it's blinking is that there's always a planet passing by, and you can see that blinking light thanks to the special direction in which it blocks the light from the star.

And by observing this blinking motion from the stars in the night sky, we can find planets.

In this way, we are now able to detect over 5,000 planets in our Milky Way galaxy, and as I said, we know there are many more.

So when we look at the light from these stars, what we see is not the planet itself, as I said, but we actually see the light dimming, which we can record in time.

That is, as the planet diminishes in front of the star, so does the light, and that's that flash we saw earlier.

Therefore, in addition to detecting planets, we can see this light at different wavelengths.

So I talked about looking at Earth and Mars in ultraviolet light.

Observations of a passing exoplanet with the Hubble Space Telescope show much larger flashes in ultraviolet light and much less light from the star as the planet passes ahead.

And we think this is because there is an atmosphere of hydrogen all over the planet, making it more bloated and blocking more of the visible light.

Thus, using this technique, we were able to discover several transiting exoplanets that are indeed escaping the atmosphere.

And for some of the planets we have discovered, these planets can be called hot Jupiters.

That's because even though they are gas planets like Jupiter, they are very close to their star, about 100 times closer than Jupiter.

And with the presence of light gas and heat from the star escaping at any moment, escape into the atmosphere would be at a completely catastrophic rate.

Thus, 1.3 billion pounds of hydrogen are lost on these planets every minute, unlike 400 pounds of hydrogen lost on Earth every minute.

So you might think, wouldn't the Earth then cease to exist?

This is what people wondered when they saw the solar system. This is because the planets closer to the sun are rocky, while those farther away are large and gaseous.

Could we start with something like Jupiter, which is actually closer to the Sun, and get rid of all the gas there?

We now think that if we start with something like hot Jupiter, we can't really end up on Mercury or Earth.

But if you start with something smaller, enough gas will escape that it can have a big impact and leave you with something completely different than what you started with.

Now, all this sounds kind of generic, but we may think of the solar system, but what does this have to do with us here on Earth?

Well, in the distant future the sun will brighten.

And when that happens, the heating from the Sun will be very intense.

Just as gas is pouring out of hot Jupiter, so too is gas pouring out of Earth.

So what we can look forward to, or at least prepare for, is the fact that in the distant future, Earth will resemble Mars.

More and more of our hydrogen will escape into space from the decomposed water, leaving behind a dry, reddish Earth.

So don't be afraid. It's not going to last billions of years. So there is still time to prepare.

(Laughter) But I wanted you to know that the exodus is happening not only in the future, but while we're talking.

So there is a lot of amazing science about what is happening on distant universes and planets, and we study these planets to learn about these worlds.

But as we learn more about exoplanets like Mars and hot Jupiters, we discover things like their escape from the atmosphere that tell us even more about our planet here on Earth.

So the next time you think space is far away, think about it.

thank you.

(applause)

Why do cats do that?

Judging by the 26 billion views of over 2 million YouTube videos that cats are adorable, lovable, jumping, hopping, climbing, cramming, stalking, clawing, chatting, and purring, one thing is certain. That is, cats are very funny.

These somewhat bizarre cat behaviors are both amusing and puzzling and have many of us wondering, "Why do cats do things like that?"

For a long time, cats were both solitary predators of small animals and prey for larger carnivores.

Both predators and prey, their species' survival relied on important instinctive behaviors that are still observed today in wild and domestic cats.

The domestic grizmo's cat-like behavior may seem puzzling, but in the wild, these same behaviors that have naturally bred to cats for millions of years would make the grizmo a supercat.

Their unique muscular structure and keen balance ability allowed cats to climb to high vantage points to survey their territory and find prey in the wild.

Grizmo doesn't need these special skills to find and seek out dinner in a food bowl today, but instinctively, looking out over a bookshelf into the living room is exactly what she's evolved to do.

As wild predators, cats are opportunistic and will hunt whenever prey is available.

Because most cat prey is small, wild cats had to feed multiple times each day and use stalk-grabbing, pouncing, killing, and eating strategies to secure food.

This is why grizmos prefer to chase and pounce on small toys and eat small meals at all hours of the day and night.

Also, since small prey tend to hide in tight spaces in their natural environment, one explanation for grizmo's tendency to reach into containers and openings is that they are driven by the same curiosity that ensured the survival of the species millions of years ago.

In the wild, cats needed sharp claws for climbing, hunting, and self-defense.

Sharpening my nails on the ground nearby also helped me get fit and ready, stretch my back and leg muscles, and reduce stress.

That doesn't mean Grizmo doesn't like your sofas, chairs, ottomans, pillows, curtains, and anything else you put in her environment.

She rips these things to shreds and keeps her nails in tipped shape. Because this is exactly what her ancestors did to survive.

Cats evolved as predators to avoid being caught, and in the wild the cats that were best at avoiding predators thrived.

Well, the Grizmo you have in your house today is good at breaking into tight spaces and finding unconventional places to hide.

This also explains why she prefers clean and odorless restrooms.

That way, they are less likely to signal her location to predators sniffing nearby.

Considering everything we know about cats, one of their most common behaviors still seems to be one of their most mysterious.

Cats purr for many reasons, including happiness, stress, and hunger.

Strangely, however, their rumbling frequencies range from 25 to 150 hertz, well within the range that can promote tissue regeneration.

So, while her gurgling is a great nap companion for Grizmo, it's possible that her gurgling is healing Grizmo's muscles and bones, and even your own.

They developed over time as solitary predators that hunt and kill to eat, and as prey that hides and flees to survive.

As such, today's cats retain many of the same instincts that allowed them to thrive in the wild for millions of years.

This explains some of their seemingly bizarre behavior.

For them, our home is a jungle.

But if so, who are we in our own cat's eyes?

Big, dumb, hairless cats fighting for resources?

Are they terribly stupid predators that they can outmaneuver every day?

Or maybe they think we're prey.

Me Too and Time's Up highlighted how harassment and discrimination are a surprisingly common part of many people's reality, and this reality extends to the workplace.

It seems like every day we hear news about abuses of power and grossly inappropriate workplace behavior in technology, finance, sports, hospitality, and more.

People are furious.

They are voicing on Twitter and social media that this situation should change.

But it's time to move beyond hashtags.

It's time to report harassment and discrimination to those who can fix this mess.

And now is the time to talk about harassment in a more inclusive way. We need to encourage people to come forward against not only sexual harassment, but harassment and discrimination based on other characteristics such as age, disability and ethnicity.

Because only together can we address the root causes and consequences of harassment.

Most of us will experience workplace harassment and discrimination at some point in our lives.

Studies show that women, people of color, and people who openly identify as LGBTQI are particularly likely to be targeted, making this a pervasive and enduring part of their reality for some.

And for most of these people (98% according to some studies), most of these people never speak up or tell their employers.

Harassment and discrimination can often be a lonely and isolating experience, and we need to get people out of under their desks.

We need to let people have a say.

The obvious first question that everyone has after being harassed is, "What should I do now?"

And this is what I want to help you with.

Getting over the barriers to reporting can be really dizzying.

How can we speak up in a society where too often our experiences are discredited or downplayed?

How can we speak up in a society that threatens to retaliate against us?

How do we deal with the silence that surrounds us?

To make matters worse, our memories are often the only evidence of what happened.

Well, here comes in.

I am a memory scientist, specializing in how we remember important emotional events.

In particular, I have focused on how the memory interview process can significantly affect the quality of the evidence in the reports we produce.

A bad interview can cause you to forget details or remember them incorrectly, but a good interview can change your life for the better forever.

After looking at lab reports and studying and researching this issue both in the courtroom and in the lab, I have analyzed all the different things that can really threaten your case and cause problems in our memory.

And now, I am looking to help those working to document and report workplace harassment and discrimination.

There are three things we've learned from this research that we can immediately apply if you're being harassed or discriminated against in the workplace.

I would like to help you turn your memories into evidence. That's proof that even memory skeptics like me are unlikely to spot the mistake.

First of all, Mr. James Comey was right.

The former FBI director sat in his car after a meeting with the president, locked himself in it, and wrote down everything he could remember about what had happened.

This now-famous recording later turned out to be very useful.

Be like Comey.

You don't have to lock yourself in your car to do this, but immediately after something happens, record what happened at the same time.

And do this before telling others about it.

Because as soon as you share your story with a friend, family member, colleague, or therapist, your memory of the event can be distorted or altered.

Uncontaminated contemporaneous evidence is worth gold.

Second, the type of evidence matters.

Sure, you can handwrite what happened, but how do you prove when you wrote it?

Instead, pull out your computer or smartphone and create a time-stamped note. This allows you to prove that it was recorded at this point.

Evidence with the current time stamp is better.

Finally, make sure what you're writing down is actually relevant.

I often see people bringing up Facebook messages and timestamped evidence, but admittedly they aren't particularly relevant or particularly useful.

It's easy to write emotional, unstructured accounts of what happened, which makes sense because it's an emotional experience, but in reality, they may not be important details for later investigation.

Write down this list.

I think you should just track this down and fill in the blanks.

First, what happened?

Describe the situation in as much detail as possible and, if possible, on the day it happened.

Second, who was there?

This may become important later.

What is the exact date and time this happened?

Where are you? Where did this happen?

Who did you tell after the event?

How did you feel during and after it happened?

Also, do you have any other evidence such as WhatsApp, photos, emails, etc. that might add credibility to your case?

These are all very easy details to record at the same time, but they are also very easy to forget later.

Studies show that humans often overestimate their ability to remember important emotional details for later.

Imagine forgetting.

Assuming you need to write it down.

Now, while these three pieces of advice are a good starting point, they certainly can't overcome many other barriers to reporting.

According to the Equality and Human Rights Commission, which released a report in 2018, there is one key recommendation for overcoming other concerns that often accompany reporting these types of incidents to employers.

What advice did they give?

Provide an online anonymous reporting tool.

Only then, they say, can we truly overcome many of the fears that come with reporting.

Now, along this line, informed by what was happening around me and by incorporating and applying the memory science that I have been studying for many years, I spoke with many people and together we created TalkToSpot.com.

Spot is an online, anonymous reporting tool that helps you document and report workplace harassment and discrimination.

It can be done anonymously, it can be done for free, and it is completely evidence-based.

You don't have to talk to anyone, you don't have to worry about being judged, and you can do it whenever and wherever you want.

You can now perform evidence-based memory interviews.

Well, this is called cognitive interviewing.

This is the same technique the police use when they are doing their job properly.

Therefore, in the best-case scenario, people who are questioned about significant emotional events are asked along cognitive interviews.

This guides you through all relevant information, so after conversing with a bot (an automated messaging system), at the end a time-stamped and securely signed PDF record is generated. You can save this as evidence in case you want to share it later or give it to your employer right away.

You can also follow our recommendations and submit anonymously to your employer.

But the reporting tools are just as useful as the audience listening.

So, if employers are serious about making changes, we've decided to give them the tools to do so as well.

Therefore, if an organization is committed to working with us and taking some action against workplace harassment and discrimination, they may be able to respond to you even if you choose to remain anonymous.

We believe it is important to work with employers to address this issue.

We think everyone would benefit from shining some light on this dark issue.

Whether it happened to you or someone you know, recording and reporting what happened can really improve how we talk about these issues.

And if you're an organization, this is a call to give your employees access to better and more effective reporting mechanisms.

We know that the current methods used by most organizations do not work effectively.

If you're working on inclusion and diversity, it's time to change that.

It's time for us to celebrate diversity.

The time has come for us to speak up for those who have been silent for too long.

The time has come for us to congratulate those who have come forward, even if they feel the need to remain anonymous.

It's time for a reporting revolution.

thank you.

(applause)

Today you and I are going to share a lot of secrets. In doing so, I hope it helps alleviate some of the shyness that many of us feel about sex.

How many people here have been yelled at by strangers?

lots of women.

For me, the best memory is when the stranger was my student.

He came up to me after class that night and his words confirmed what I already knew. "I'm so sorry, Professor.

If I had known it was you, I would never have said that. ”

(Laughter) I wasn't human to him until I became his professor.

This concept, called objectification, is the foundation of sexism, and we see it reinforced through every aspect of our lives.

We see this in the government's refusal to punish men who rape women.

Often seen in advertisements.

How many of you have ever seen an ad using women's breasts to sell totally unrelated products?

Or will there be more and more movies depicting women as mere romantic objects?

While these examples may seem insignificant and innocuous, they are insidious and slowly build a culture that refuses to see women as human beings.

This is seen in the school that sent a 10-year-old girl home because her schoolboy's clothes were disturbing her, the government that refused to punish a man who repeatedly raped a woman, and the woman killed on the dance floor for asking him to stop grinding.

The media plays a major role in perpetuating the objectification of women.

Think of classic romantic comedies.

These movies usually introduce two kinds of women, two kinds of desirable women.

The first is a sexy bombshell.

This is an incredibly gorgeous woman with a perfect body.

Our protagonist man takes no trouble identifying her and even more trouble having sex with her.

The second is the protagonist woman, a beautiful but reserved woman who falls in love even though the protagonist man initially didn't realize it, or even if he did, he didn't like her.

The first is a slut.

She should be consumed and forgotten.

She has a lot of spare time.

The second is desirable but modest, and therefore more suitable for our protagonist male future baby.

Marriage stuff.

In fact, it is said that women have two roles, but it is difficult for these two roles to exist in the same woman.

On the rare occasion that I tell a new acquaintance that I'm studying sex, they're usually quite interested, even if the conversation doesn't end there.

"Oh, please tell me more."

me too.

"I am very interested in studying the sexual behavior of pregnant and postpartum couples."

At this point I get a different kind of response.

(laughs) "Oh. Hmm.

Do pregnant people have sex too?

Have you ever wanted to study libido and orgasms?

It would be funny and sexy. ”

teach. What is the first word that comes to mind when you think of a pregnant woman?

When we asked more than 500 adults this question, most of them answered "belly", "round" and "cute".

This didn't surprise me much.

What else would you rate cute?

babies. puppies. kittens.

senior citizen. right?

(Laughter.) But when we label adults as “cute,” we rob them of much of their intelligence and complexity.

We reduce them to childlike qualities.

Heterosexual men were also asked to imagine their partner's woman pregnant, and women were asked to imagine themselves pregnant and to tell them the first word that comes to mind when they think of sex.

Most of the responses were negative.

"gross."

"awkward."

"Not sexy." "Odd."

"Not comfortable."

"how?"

(Laughter) "It's not worth the effort." "It's not worth the risk."

The last one really stuck in my mind.

We might think that by disassociating ourselves from the pregnant woman and mother, we remove the constraints of sexualization.

They experience less sexism. right?

not exactly.

What happens instead is another kind of objectification.

While trying to explain this to others, a conversation led to the Venus of Willendorf. This Venus is a Paleolithic figurine assumed by scholars to be the goddess of love and beauty, hence the name Venus.

However, this theory was later revised when scholars noted the sculptor's apparent focus on the statue's reproductive function. A round belly that is probably pregnant. Remnants of red dye suggestive of menstruation or childbirth.

The researchers also believed that she was supposed to be held or laid down because her small legs meant she could not stand on her own.

She didn't have a face either.

For this reason, she was considered a representation of fertility and not a portrait of a person.

she was an object

In the history of her interpretation, she has moved from an ideal object of beauty and love to an object of reproduction.

I think this transition speaks more to the scholars who interpreted her purpose than to the actual purpose of the statue itself.

When a woman becomes pregnant, she leaves the realm of male libido and slips into the reproductive and parenting role.

In doing so, she also becomes an asset to the community and is held in high esteem, but only because she is pregnant. right?

I chose to call this the Willendorf effect, and again I find it reinforced in various aspects of her life.

Has anyone here been visibly pregnant?

(Laughter) Right. A lot of people do, right?

So how many of you have had your stomach touched by a stranger while you were pregnant, possibly without asking permission first?

Or were you told by someone other than your doctor or health care provider what you can and can't eat?

Or did you ask a private question about birth planning?

And did you explain why those choices are all wrong?

Yeah me too

Or did the clerk refuse to bring the wine?

This might make you pause for a moment, but hang on.

This is the big secret.

In fact, it's safe to drink moderately during pregnancy.

Most of us don't know this. Because doctors don't trust pregnant women who know this secret (laughs), especially uneducated pregnant women and women of color.

What this tells us is that this Willendorf effect is both classist and racist.

Every time a new anti-choice bill comes out, the government reminds women that the contents of the womb are not theirs.

Better to be safe than sorry, right? ”

She has denied basic privacy and bodily autonomy in the name of being a good mother.

We don't trust her to make her own decisions.

She's cute, remember?

Excuse us when we convey sexual pleasure to women.

When we tell a woman that "sex isn't worth risking while pregnant," what we're telling her is that her sexual pleasure doesn't matter.

So what we want to tell her is that even if her unborn baby's needs don't contradict her own needs, it doesn't really matter to her.

Therefore, health care providers such as the American College of Obstetricians and Gynecologists have an opportunity to educate them about the safety of sex during pregnancy.

So what are the experts saying?

In fact, the ACOG has not made any official statements about the safety of sex during pregnancy.

The Mayo Clinic's guidance is largely positive, but it also presents a caveat: "Most women can safely have sex throughout pregnancy, but in some cases caution is warranted."

Some women don't want to have sex while pregnant, and that's okay.

Some women want to have sex while pregnant, and that's okay.

What should stop is society telling women what they can and can't do with their bodies.

(Applause.) Pregnant women are not faceless, identityless reproductive organs that cannot stand on their own feet.

But the truth is, the real secret is that we are telling all women that sexual pleasure is not important.

We don't even accept that there are women who have sex with women and who don't want children.

"Oh, it's just a stage...

All she needs is the right man to come along. ”

It's always revolutionary when women have sex simply because it feels good.

she is a revolutionary

She rebels against society's claims that she exists solely for male pleasure and reproduction.

A woman who puts her sexual needs first is scary, because a woman who puts her sexual needs first puts herself first.

(Applause.) It's a woman who wants to be treated equally.

It's about women demanding that they make room for themselves in positions of power. That's scarier than anything else. Because we can't make room for her unless we give up the extra space we have within us.

(Applause) Finally, there's a secret.

I am a mother of two boys and need your help.

My sons hear me say regularly that it is important for men to recognize women as equals and that they see their fathers model it, but it takes what is happening in the world to reinforce what is happening at home.

This is neither a man's problem nor a woman's problem.

This is everyone's problem and we all have a part to play in dismantling the inequality system.

First of all, we must stop teaching women what they can and cannot do with their bodies.

(Applause.) This includes not treating pregnant women like community property.

If you don't know her, don't ask her to touch her belly.

No one else can.

Don't tell her what can and can't be eaten.

Do not ask for personal details about her medical decisions.

This includes understanding that even if you are personally against abortion, you can fight for women's right to choose.

When it comes to women's equality, the two need not be at odds.

If you are the one who has sex with a woman, prioritize her pleasure.

If you don't know how, just ask.

If you have kids -- (laughter) talk about sex as early as possible. Because kids don't look up sex in the dictionary anymore.

They look it up on the internet.

And don't just focus on procreation when talking about sex.

People have sex for many reasons. Most people have sex because it feels good, partly because they want a baby.

Admit it.

And support shame-free, comprehensive sex education for teens, whether they have children or not.

(Applause.) There's nothing more to be gained from shaming teens' sexual desires and behavior than positive STD and pregnancy tests.

Every day we are all given the opportunity to disrupt patterns of inequality.

I think we can all agree that it's worth the effort.

thank you.

(applause)

I am a chef and food policy maker, but my whole family grew up in a family of teachers.

My sister is a special education teacher in Chicago.

My dad just retired after 25 years of teaching 5th grade.

My uncle and aunt were professors.

All my cousins ​​teach.

In my family, basically everyone teaches except me.

They taught me that the only way to get the right answers is to ask the right questions.

So what are the right questions to ask when it comes to improving children's educational outcomes?

There are many obviously important questions, but I think the following is a good place to start. What do you think is the relationship between a child's mental and physical development?

What can children learn if their diet is full of sugar and zero nutrients?

What can they learn if their bodies are literally starving?

And while we're pouring every resource into our schools, we should stop and ask ourselves. “Are we really leading our children to success?”

A few years ago, I was a judge for a cooking contest called Chopped.

Four chefs compete to see who can cook the best dish using a mysterious ingredient.

Except for this episode, it was a very special episode.

Not four aspiring chefs trying to get the limelight, I didn't know anything about it (lol), but these chefs were school chefs. You know, the women you used to call "lunchers," but I advocate calling them "school chefs."

Today, these women—God bless these women—are spending the day cooking breakfast and lunch for thousands of children, spending only $2.68 per lunch, of which only about $1 is actually spent on food.

In this episode, the main course mystery ingredient was quinoa.

Well, it's been a long time since most of you ate school lunches, and we've made a lot of progress nutritionally, but quinoa is still not a staple in most school cafeterias.

(Laughter) This was a challenge.

But a dish I will never forget was cooked by a woman named Cheryl Barbara.

Cheryl was a nutrition director at a community high school in Connecticut.

She made this delicious pasta.

It was amazing.

It was pappardelle with Italian sausage, kale and parmesan cheese.

It tasted like restaurant quality, but she basically just threw barely cooked quinoa on the plate.

It was an odd choice, but very chewy.

(Laughter) So I asked her why she did what a judge should do on TV.

Cheryl replied, "First, I don't know what quinoa is."

(Laughter) "But I know it's Monday, and my school, the community high school, always cooks pasta."

Cheryl explained that many of her children didn't eat on the weekends.

No food on Saturday.

No food on Sundays.

So she wanted to make sure it was something her kids would eat, so she made pasta.

There was something stuck in the ribs, she said.

something that satisfies them.

Cheryl said that by the time Monday came around, her children were so hungry that they couldn't even think about learning.

Food was the only thing on their minds.

the only one.

And unfortunately, the statistics tell us the same.

Now let's put this in the context of children.

And let's focus on the most important meal of the day: breakfast.

Meet Alison.

She is 12 years old, smart as a whip, and wants to be a physicist when she grows up.

If Alison goes to a school that provides a nutritious breakfast for all children, the following will happen.

Your chances of eating a nutritious diet, such as one with fruit and milk, and one low in sugar and salt, are dramatically increased.

Alison's obesity rate would be lower than the average child.

She will have less to go to the nurse.

Her anxiety and depression are reduced.

She will behave better.

Her attendance improves and she shows up more often and on time.

why?

Because delicious meals are waiting for you at school.

All in all, Alison is in much better health than the average school kid.

So what happens to children who don't eat a nutritious breakfast?

Let's meet Tommy.

He is also 12 years old. A wonderful child.

he wants to be a doctor

By the time Tommy enters kindergarten, he is already failing in math.

In third grade, mathematics and reading performance declines.

By the time Tommy turns 11, it's likely that he'll have to repeat a grade.

Research shows that children who don't get consistent nutrition, especially at breakfast, have lower cognitive function overall.

So how pervasive is this problem?

Well, unfortunately, it's prevalent.

Here are two statistics that seem to be polar opposites of the problem, but are actually two sides of the same coin.

Meanwhile, 1 in 6 Americans are food insecure, and 16 million of those children (nearly 20 percent) are food insecure.

In New York City alone, 474,000 children under the age of 18 face hunger each year.

it's crazy.

Meanwhile, diet and nutrition are the biggest causes of preventable death and disease in this country.

And one-third of the children we are talking about tonight will develop diabetes in their lifetime.

Now, it's hard to sum it all up, but the truth is that in many cases these are the same children.

As such, they are around in the community, filling their stomachs with unhealthy and cheap calories that their families can afford.

But at the end of the month, food stamps run out, working hours are cut short, and you run out of money to cover basic food expenses.

But this problem should be solvable, right?

we know the answer

As part of my work at the White House, I enacted a program for every school with 40% more low-income children to provide breakfast and lunch to every child in that school.

For free.

The program has been incredibly successful in helping us overcome the extremely difficult barrier of getting children to eat nutritious breakfasts.

And that was the stigma wall.

The school served breakfast before the start of the day, which was only available to poor children.

So everyone knew who was poor and who needed government assistance.

Now, all children have great pride, regardless of their parents' income.

what happened?

Schools that implemented the program saw a 17.5 percent increase in math and reading scores.

17.5 percent.

And studies show that when kids eat a consistently nutritious breakfast, they're 20% more likely to graduate.

20 percent.

We give children the nutrition they need, giving them the opportunity to thrive in and out of the classroom.

Now, you don't have to take credit for this, but please consult Donna Martin.

I love Donna Martin.

Donna Martin is the Director of School Nutrition for Burke County in Waynesboro, Georgia.

Burke County is one of the poorest neighborhoods in the nation's fifth-poorest state, with approximately 100% of Donna's students living below the poverty line.

A few years ago, Donna decided to overhaul her nutrition standards ahead of the upcoming new standards.

She modified it by adding fruits, vegetables and whole grains.

She served breakfast to all the children in the classroom.

And she ran a dinner program.

why?

Well, many of her kids didn't have dinner when they got home.

So how did they react?

Well the kids loved the food.

They loved better nutrition and loved not being hungry.

But Donna's biggest supporters came from the most unexpected places.

His name comes from Eric Parker, who was the head football coach for the Burke County Bears.

Well, Coach Parker has been coaching mediocre teams for years.

The Bears often ended up in the middle. For one of the most football-enthusiastic states in the Union, it was a huge disappointment.

However, the year Donna changed the menu, the Bears not only won the division, but also won the state championship by beating the Peach County Trojans 28-14.

(Laughter) And Coach Parker credited that championship to Donna Martin.

When we give our children basic nutrition, they grow.

And it's not just about Cheryl Barbara and Donna Martin all over the world.

It's up to us all.

And providing basic nutrition for children is just the starting point.

What I have presented is, in fact, a model of many of the most pressing problems we face.

Focus on the simple goal of feeding yourself properly and you will see a more stable and safer world. Economic productivity can be dramatically improved. We can transform healthcare and do a great deal to ensure the planet can feed future generations.

Food is where our collective efforts can have the greatest impact.

So we have to ask ourselves. "What is the right question?"

What if we fed ourselves more nutritious and more sustainably grown food?

What is the impact?

Cheryl Barbara, Donna Martin, Coach Parker and the Burke County Bears -- I think they know the answer.

Thank you very much to all of you.

(applause)

Ever since I was a child, I remember these Turkish rugs when I used to crawl around the house. And then there were these scenes, fight scenes, love scenes.

So, look, this animal is trying to fight back against this soldier's spear.

And my mom actually took a picture of our carpet last week, which I still remember.

There were also towering furniture-like objects painted with creatures, gargoyles, and nudes. It was pretty scary as a kid.

This reminds me today that stories have a very strong influence on my work because objects tell stories.

And then there was another effect.

I was a teenager, and when I was 15 or 16, probably like all teenagers, we only wanted to do what we liked, what we believed in.

There I combined the two things I love most: skiing and windsurfing.

These are a great way to escape the overcast Swiss weather.

So I made a combination of the two. I took my skis and board, put a mast foot on it, attached foot straps and some metal fins. And here I was, running so fast over the frozen lake.

It really was a death trap. I mean, it was incredible, it worked incredibly well, but it was really dangerous.

And then I realized that I had to go to design school.

(Laughter) I mean, look at the graphics there.

(Laughs) So I went to design school and graduated in the early 90s.

And I saw something insane going on in Silicon Valley, so I wanted to go there, and I saw computers coming to our homes, I knew we had to change that for us to stay home.

So I found a job and was working at a consulting firm. And then we would go to these meetings and the managers would come in and say, 'It's really important what we're trying to do here, you know?

And they give the projects code names, mostly from "Star Wars" actually codenamed C3PO, Yoda, Luke, etc.

So I raised my hand and asked a question in hopes of being this young designer behind the room.

So, in retrospect, it might seem like a silly question, but it's something like, "What's the Caps Lock key for?"

"What is this Num Lock key for?" Do you know?

"Hey, are you guys really using it?

Do they need it? Do they want it in their home? ”

(Laughter) What I realized then was that they didn't really want to change the legacy stuff. They didn't want to change the inside.

They really wanted us, designers to create skins and add something beautiful outside the box.

And I didn't want to be a colorist.

It wasn't what I wanted to do.

I never wanted to be a stylist like this.

And then I saw this word. “Advertising is the price a company pays for its lack of originality.”

(Laughter) So I had to start on my own. So I moved to San Francisco and started a small company called Hughes Projects.

And what I wanted to work on is important.

And I didn't just want to work on the skin, I wanted to work on the whole human experience.

My first project was humble, but I took the technology and maybe made it something people could use in new ways and maybe discovered new capabilities.

This is a watch made by the automobile company Mini Cooper when it first went on sale, and it was the first watch with a display that switched from horizontal to vertical.

This allowed me to check the timer independently without bending my elbow.

And other projects were just about transformation, adapting to human needs.

This is a small piece of furniture from an Italian manufacturer that ships completely flat and can be folded to become a coffee table, stool, etc.

And a little more experimental. This is a Swarovski lighting fixture that changes shape.

So from a circle to a circle to a square to a figure eight.

Also, by simply drawing a small drawing on your computer tablet, the entire luminaire will be adjusted to the desired shape.

And finally, a Herman Miller leaf lamp.

This is a fairly complicated process. It took about four and a half years.

But what I really wanted was to create a unique light experience, a new light experience.

So I had to design both the light and the bulb.

And it can be said that it is a once-in-a-lifetime chance in design.

And the new experience I've been looking for is giving users a choice, from warm, kind of glowing mood lights to bright work lights.

So the bulb actually does it.

This allows a person to switch or mix these two colors.

It is done in a very simple way. Simply touch the base of the light to mix the brightness on one side and the color of the light on the other.

So all of these projects have a humanitarian sensibility and I think we as designers need to really think about how we can create different relationships between our work and the world, whether it's for business or, as we'll see, some civic projects.

Because I think we all agree that as designers we bring value to our business and we bring value to our users, but I think it's the value we put into these projects that ultimately creates more value.

And the value we bring can be about environmental issues, sustainability, reducing power consumption, etc.

You know, they can be about functionality and beauty. It can also be about business strategy.

But designers are really the glue that holds these things together.

Jawbone is a well-known project with humanized technology.

Feel it on your skin. It sits on your skin and recognizes when you speak.

And knowing when you're speaking will filter out the other noise you're perceiving—environmental noise.

But what's also human about Jawbone is that we decided to strip it of all technical and geeky elements and make it as beautiful as possible.

please think about it. Care is very important when choosing sunglasses, jewelry and accessories. Therefore, if it is not beautiful, it is not suitable for your face.

And this is what we are after here.

But our approach at Jawbone is very unique.

I want to point to the one on the left here.

That's the board, one of the things that's inside that makes this technology work.

But this is the design process. Someone changes the board, puts tracers on the board, changes the location of the IC while the designer on the other side is working.

So this is no longer about slapping technology.

It's really about designing from the inside out.

And on the other side of the room, the designer is sketching, drawing by hand, typing on the computer, and fine-tuning.

And that's what I call design driven.

You know, there are some pushes and pulls, but design really helps define the whole experience from the inside out.

And of course the design is never finished.

And this is another new way of working that is unique in how we work. This never completes, so all other work has to be done.

Both the package and the website must continue to really touch the user in many ways.

But how do you keep someone if it's never over?

Hosain Rahman, CEO of Aliph Jawbone, is well aware that a different structure is needed.

So in a way the different structure is that we are partners, we are partnerships. We can work on this project and stay committed to it, and share in the rewards.

And this is another project, another partnership approach.

It's called Y Water, and an Austrian man from Los Angeles called Thomas Arndt came to us. All he wanted to do was create healthy drinks for his kids—organic drinks—and an alternative to the high-sugar sodas that were trying to keep them away.

So we worked on this bottle, which is perfectly symmetrical in every dimension.

This turns the bottle into a game.

By connecting bottles, you can make different shapes, different shapes.

(Laughter) (Applause) Thank you.

(Applause.) And while we were doing this, the upside-down shape of the bottle reminded us of Y, and we figured the words "why" and "why" are probably the most important words kids ask.

So we named it Y Water. And here is another place where everything comes together in the same room. Three-dimensional design, ideas, and branding are all deeply connected.

And the other thing about this project is that we bring the intellectual property, we bring the marketing approach, we bring all of this, but at the end of the day it's these values ​​that we bring, and I think these values ​​create the soul of the companies that we work with.

And it's especially rewarding when your design work becomes a creative endeavor that inspires others to get creative and do even more with it.

Here's another project that I think emulates exactly that.

It's a "one laptop per kid" or $100 laptop.

This photo is incredible.

In Nigeria, people carry their most prized possessions on their heads.

This girl goes to school with a laptop on her head.

So for me, it means a lot.

But when Nicolas Negroponte, who is the founder of OLPC and talks a lot about the project, came to us about two and a half years ago, we had some clear ideas.

He wanted to bring education and technology. These are the pillars of his life and the mission of "one laptop for a child".

But the third pillar he spoke about was design.

At the time, I wasn't really working on computers.

Since my last adventure, I didn't really want to do it.

But what he said was really important. That said, the reason kids love this product is because of its design and how it's made inexpensive and robust.

Additionally, he said he plans to get rid of the Caps Lock key (laughter) and the Num Lock key as well.

So I was convinced. We designed it to be iconic and to look different. It looks like it's for kids, but it doesn't look like a toy.

And the integration of all these great technologies you've all heard about, Wi-Fi antennas that let kids stay connected. The screen is readable even in sunlight. The keyboard is made of rubber to protect it from the environment.

All these amazing technologies have been made possible thanks to the passion of OLPC's employees and engineers.

They fought suppliers, they fought manufacturers.

So they fought like animals to maintain the status quo.

And in a way, that will is what makes projects like this happen. Don't let the process destroy the original idea.

And I think this is really important.

Well, take a look at these photos. When you wake up in the morning, you see children in Nigeria, children with computers in Uruguay, children in Mongolia.

And clearly moved away from beige.

It's colorful and fun.

In fact, you can see that each logo is slightly different.

That's because during the manufacturing process, you can run 20 colors, the names of the computer, X and O, and mix them on the shop floor to get 20 times 20, or 400 different options.

So the lessons to be learned from watching children in developing countries use them are incredible.

But this is my nephew Anthony in Switzerland. He had his laptop with him this afternoon and I had to get it back. It was hard.

(laughs) And it was a prototype. And a month and a half later, I'm back in Switzerland, where he's playing his own version.

(Laughter) It's like paper, paper, cardboard.

So we'll end with one last project. This is a little more adult play.

(Laughter) Some of you may have heard of condoms in New York City.

Actually, it was just released, and it was actually released on Valentine's Day, February 14, about 10 days ago.

So the New York Department of Health came to us and needed a way to distribute 36 million condoms to New Yorkers for free.

Therefore, as a fairly large-scale effort, we worked on the development of dispensers.

These are dispensers. There is also such a gentle form.

This is a bit like a fire hydrant design, but the hydrant should be easy to maintain. I need to know where the hydrant is and what it does.

And we designed the condom itself.

And I was just in New York for the launch, so I went to see all the places they were set up. This is a small family owned store in Puerto Rico. At a bar on Christopher Street. at the billiard hall.

I mean, it's installed in every homeless clinic.

Clubs and discos of course.

And here is the public service announcement for this project.

(music) (laughter) Buy it.

(Applause) So this is exactly where design can create conversation.

I've been at these venues and people were keen to get it. they were excited.

It's about breaking the ice and overcoming stigma, and I think that's what design can do.

So I was going to throw a condom or something in the room, but I don't know if that's the etiquette here.

(laughs) Is that so? I get it. there are only a few.

(Laughter) (Applause) So there's a lot more, so feel free to ask later.

(Laughter.) And if someone asks why you carry a condom around, just say you love the design.

(Laughs) So, I'll end with one thought, but if we all work on value creation, if we really keep the values ​​of our work in mind, we can change our work.

We can change these values, we can change the companies we work with, and ultimately we might be able to change the world together.

Thank you very much.

(applause)

Imagine a sculptor using a chisel to build a statue.

Michelangelo said with this elegant expression, "Inside every stone block there is a statue, and it is the sculptor's job to discover it."

But what if he works in the opposite direction?

Not from a solid block of stone, but from a pile of dust, millions of these particles were somehow glued together to form an image.

I know it's an irrational idea.

Probably not possible.

The only way to get an image from a dust pile is if the image is built automatically, that is, if you can somehow force millions of particles together to form the image.

As strange as it sounds, this is pretty much the same problem I'm working on in my lab.

I don't build with stone, I build with nanomaterials.

They are incredibly small and charming little objects.

They're so small that if this controller were nanoparticles, a human hair would be the size of this entire room.

And they're at the heart of what we call nanotechnology, and I think everyone's heard about it, and how it's going to change everything.

My time as a graduate student was one of the most exciting times in nanotechnology research.

Scientific progress was always happening.

The conference was a blast, with a large influx of funds from funding agencies.

The reason is that when objects become very small, they are governed by a different set of physics that govern ordinary objects like the ones we interact with.

We call this physics quantum mechanics.

And you'll find that by making seemingly small changes, like adding or removing a few atoms or twisting the material, you can precisely tune its behavior.

It's like the ultimate toolkit.

You felt really empowered. I felt like I could make anything.

And we were doing it. By us, I mean all the graduate students of my generation.

We were trying to make super fast computers with nanomaterials.

We were building quantum dots. It will one day be able to enter your body and find and fight disease.

There was even a group trying to build an elevator to space using carbon nanotubes.

Look it up, it's true.

Either way, we thought it would impact every part of technology, from computing to medicine.

And I have to admit I drank all my Kool-Aid.

That is, to the last drop.

But that was 15 years ago, and great science, really important research was done.

we learned a lot.

We couldn't translate that science into new technology, technology that could actually impact people.

The reason is that these nanomaterials are like a double-edged sword.

The same thing that makes them so interesting, their small size, makes them impossible to handle.

It's literally like trying to build a statue out of a pile of dust.

And we don't have enough small tools to handle them.

But even if it could, it doesn't really matter. Because you can't build technology by placing millions of particles one by one.

So all promises and excitement remain promises and excitement.

We have no disease-fighting nanobots, no elevators to space. And neither are the new types of computing that I'm most interested in.

The last item is very important.

We have come to expect an endless pace of computing progress.

We have built our entire economy on this idea.

And this pace exists thanks to our ability to put more and more devices on computer chips.

And as these devices get smaller, they get faster, consume less power, and get cheaper.

And it is this convergence that is giving us an incredible pace.

As an example, let's say you somehow compressed a computer the size of the room that sent three people back to the moon. The world's best computer at the time was compressed to be the size of a smartphone. A real smartphone, the one you spent $300 on and threw away every two years, would be blown away.

You won't be impressed.

Nothing you can do on your smartphone.

It'll be slow, you won't be able to post anything, and if you're lucky you'll get through the first two minutes of an episode of The Walking Dead -- (Laughter) Progress is what matters -- it's not gradual.

Progress is relentless.

It's exponential.

It gets worse every year, to the point where it's almost unrecognizable when you compare technology from one generation to the next.

And we have a responsibility to continue this progress.

We want to say the same thing 10, 20, 30 years from now. See what we've been up to over the last 30 years.

But we know this progress won't last forever.

In fact, the party is ending.

It's kind of like "Last Call for Alcohol," isn't it?

If you look inside on many metrics like speed and performance, progress has already slowed down and stopped.

So if we want this party to continue, we have to do what we've been doing. It's about innovating.

Therefore, our group's role and mission is to utilize and innovate with carbon nanotubes. We believe that carbon nanotubes can provide a way to continue this pace.

That's exactly right.

They are tiny hollow tubes of carbon atoms and it is their nanoscale size, that is their small size, that gives rise to these excellent electronic properties.

And, according to science, if these could be adopted for computing, it could improve performance by up to 10x.

It's like skipping several technology generations in just one step.

You are done.

We have this really important problem and basically have an ideal solution.

Science is shouting to us, "This is what we have to do to solve our problems."

So all right, let's get started, let's do this.

But you're really going back to being a double-edged sword.

This "ideal solution" contains materials that are impossible to work with.

Billions of chips must be put together to make just one computer chip.

It's the same conundrum, like an eternal problem.

At this point, we said, "Let's stop."

Don't follow the same path.

Think about what you're missing.

What are we not dealing with?

What are we not doing that should be done? ”

Sounds like The Godfather, right?

We know what has to be done when Fredo betrays his brother Michael.

Fredo has to go.

(Laughter.) But Michael puts it off.

got it.

Their mother is still alive, which would upset her.

We just said, "What's our problem Fredo?"

What are we not dealing with?

What are we not doing to make this successful?"

The answer is that the statue must be built by itself.

We have to somehow find a way to force billions of these particles into technology.

we can't do it for them. they have to do it themselves.

It's the hard way, not the easy one, but in this case it's the only way.

Now, as it turns out, this isn't that special of a problem.

This method does not build anything.

People don't build anything this way.

But if you look around, there are examples everywhere, but Mother Nature builds everything this way.

Everything is built bottom up.

If you go to the beach, you can find simple organisms that use proteins (molecules, basically) to mold what is essentially sand. They pluck the sand out of the sea and build extraordinary structures of extraordinary diversity.

And nature is not crude like us, it just hacks.

She is elegant and clever, building with what is available molecule by molecule, creating structures of complexity and diversity that we can't even come close to.

And she's already in Nano.

She's been there for hundreds of millions of years.

We were late to the party.

So we decided to use the same tool that nature uses: chemistry.

Chemistry is the missing tool.

Chemistry works in this case. Because these nanoscale objects are about the same size as molecules, we can use the nanoscale to manipulate these objects like tools.

That's exactly what we did in the lab.

We've developed chemistries to get into dust heaps and nanoparticle heaps and extract exactly what you need.

Chemistry can then be used to arrange literally billions of these particles into the patterns needed to build circuits.

And because we can do that, we can use nanomaterials to build circuits many times faster than anyone has ever built.

Chemistry is the missing tool, but ours is getting sharper and more precise every day.

And finally, hopefully within a few years, we will be able to deliver on one of the original promises.

Now, computing is just one example.

This is an area I'm interested in, and an area my group is seriously investing in, but there are other areas in renewable energy, medicine, and structural materials where science tells us to move to nano.

That's the biggest advantage.

But if that's to happen, scientists today and tomorrow will need new tools, tools like the ones I've described.

And they will need chemistry. That's the point.

The beauty of science is that as soon as we develop these new tools, they are out in the world.

They will be there forever, anyone, anywhere can pick them up and use them, helping to deliver on the promise of nanotechnology.

Thank you for the place busy. I appreciate it

(applause)

So today I want to talk about how we talk about love.

Specifically, I want to talk about what's wrong with the way we talk about love.

Most of us have probably fallen in love several times in our lives. In English, this trope "falling" is actually the main way to talk about the experience.

I don't know about you, but when I conceptualize this metaphor, I picture it straight out of a cartoon. It's like a man walking down a sidewalk, unknowingly going over an open manhole and dropping straight into the sewer below.

And because falling is not jumping, I picture it this way.

Falls are accidental and uncontrollable.

It is what happens to us without our consent.

This is the main way we talk about starting new relationships.

I am a writer and also an English teacher. In other words, my job is to think about words.

I would argue that we get paid to argue that the words we use matter, and that many or most of the metaphors we use to talk about love are problematic.

So we fall in love.

We were shocked.

we are devastated.

we fainted.

We are passionate.

Love makes us crazy and sick.

Our hearts ache and break.

Our metaphor therefore equates the experience of loving someone to extreme violence or illness.

(laughter) Yes.

And they position us as victims of unforeseen and completely unavoidable circumstances.

My favorite is ``smitten'', the past participle of the word ``smite''.

If you look this word up in the dictionary, you'll see (laughter) that it can be defined as both 'too much suffering' and 'to be very in love'.

I tend to associate the word "thump" with a very specific context of the Old Testament.

In Exodus alone, there are 16 references to “beat,” a word used in the Bible for revenge by an angry God.

(Laughter.) We're using the same words here to describe love that we use to describe a locust outbreak.

(laughs) Right?

So how did this happen?

How did we come to associate love with great pain and suffering?

And why do we talk about this ostensibly good experience as if we were the victims?

These are tough questions, but I have some theories.

To reflect on this, I would like to focus on one metaphor in particular. It is the concept of love as madness.

When I first started researching romantic love, I found crazy tropes like this all over the place.

The history of Western culture is replete with words that equate love with mental illness.

These are just a few examples.

William Shakespeare: "Love Is Just Madness" from As You Like It

Friedrich Nietzsche: "There is always madness in love."

A great philosopher, Beyoncé Knowles said, "I was absorbed, I seemed to be absorbed --" (laughs).

(Laughs) I first fell in love when I was 20, and it was a pretty rocky relationship from the start.

The first few years were long haul, so for me that meant very high highs and very low lows.

I remember one moment in particular.

I was sitting on a bed in a South American hostel watching my loved one come out the door.

And it was late at night, almost midnight. We had an argument over dinner and when we got back to our room he dumped his things in his bag and ran off.

I can no longer remember what the discussion was about, but I do remember clearly how it felt to see him leave.

I am 22 years old, my first time in a developing country and completely alone.

I had a week to go before my flight home, and although I knew the name of the town I was in and the name of the city I had to fly to to leave, I had no idea how to get there.

I didn't have a guidebook, had little money, and didn't speak Spanish.

Someone more adventurous than me might have seen this as an opportunity, but I just stuck.

i was just sitting there.

And suddenly I burst into tears.

But despite my panic, a small voice in my head thought: "Wow, that was dramatic.

I must be doing this love affair really right. ”

(Laughter) Because somewhere in my heart, I wanted to be miserable in love.

It may sound very strange now, but at 22, I longed for a dramatic experience. At that moment, I was irrationally angry and overwhelmed. And oddly enough, I wondered if this somehow justified the feelings I had for the man who had just left me.

In a way, I think I wanted to feel a little crazy. Because I thought that's how love works.

This is not surprising given that Wikipedia has 8 movies, 14 songs, 2 albums and 1 novel titled Crazy Love.

Half an hour later he returned to our room.

we made up.

We traveled together again and had a mostly happy week.

And when I got home, I thought, 'That was really bad and it was great.

This must be a real romance. ”

I expected my first love to be something of a madness, and of course it lived up to those expectations.

But loving someone like that was not very good for me or for him, as if all my happiness depended on him loving me back.

However, I don't think this kind of love experience is that rare.

Most of us feel a little angry in the early stages of romantic love.

In fact, there are studies that confirm this to some extent to be normal, because neurochemically speaking love and mental illness are not so easily distinguishable.

this is true.

This 1999 study used a blood test to confirm that serotonin levels in newly romanticized people are very similar to those in people diagnosed with obsessive-compulsive disorder.

(Laughter) Yes, low serotonin levels are also associated with seasonal affective disorder and depression.

So there is some evidence that love is associated with changes in our moods and behaviors.

And there are also other studies that confirm that most relationships start this way.

Researchers believe that low levels of serotonin are correlated with obsessive thoughts about love objects, akin to the feeling that someone is setting up a camp in the brain.

And most of us feel this way when we first fall in love.

But the good news is that it doesn't always last that long - usually months to years.

When I returned from a trip to South America, I spent a lot of time alone in my room, checking emails and longing to hear from loved ones.

I decided that if my friends could not understand my miserable suffering, I did not need their friendship.

So I stopped dating most of them.

And it was probably the most unhappy year of my life.

But I think I felt it was my job to be miserable. Because if I can be miserable, I will prove how much I love him.

And if we can prove it, we should be together in the end.

This is real madness. Because there is no universal law that great suffering equals great reward, yet we speak of love as if this were true.

Our experience of love is biological and cultural.

Our biology tells us that love is good by activating these reward circuits in the brain, but that love is painful when the neurochemical rewards disappear after a fight or breakup.

And indeed, as you may have heard this, going through a breakup, neurochemically speaking, is a lot like going through cocaine withdrawal, and I find that comforting.

(Laughter) And our culture uses language to shape and reinforce these ideas about love.

In this case we are talking about metaphors about pain, addiction and madness.

It's kind of an interesting feedback loop.

Love is powerful and sometimes painful, and we express it in words and stories that make us expect love to be powerful and painful.

What's interesting to me is that all of this is happening in a culture that respects lifelong monogamy.

We want love to be like madness, and we want it to last a lifetime.

That sounds terrible.

(Laughter) To reconcile this, we need to change the culture or change the expectations.

Now imagine if we were all more reluctant about love.

If only we were more proactive, more open-minded, more generous, walking into love instead of falling in love.

I know there are a lot of questions about this, but I'm not the first to actually suggest this.

Linguists Mark Johnson and George Lakoff offer a very interesting solution to this dilemma in their book The Metaphors We Live In. It's about changing our metaphor.

They argue that metaphors actually shape the way we experience the world and, like self-fulfilling prophecies, can even serve as guides for future actions.

Johnson and Lakoff propose a new metaphor for love: love as a joint work of art.

I love this way of thinking about love.

Linguists talk about metaphors as having implications, which is essentially a way of considering all the meanings of a given metaphor and the ideas it contains.

And Johnson and Lakoff talk about hard work, compromise, perseverance, common goals, and everything that goes into collaborating on a work of art.

These ideas align well with cultural investments in long-term romantic relationships, but also work well with other types of relationships (short-term, casual, polyamorous, non-monogamous, asexual). Because this metaphor brings a much more complicated idea to the experience of loving someone.

Therefore, if love is a joint work of art, love is an aesthetic experience.

Love is unpredictable, love is creative, love requires communication and discipline, is frustrating and emotionally taxing.

And love brings both joy and pain.

After all, each love experience is different.

When I was younger, it never occurred to me that I could ask for more from love, or that I didn't have to just accept what it gave me.

When 14-year-old Juliet meets for the first time, or when 14-year-old Juliet doesn't get along with Romeo, whom she met four days ago, she doesn't feel disappointed or anxious.

where is she

she wants to die

right?

As a reminder, Romeo is not dead at this point in Act 3 of Act 5 of the play.

He's alive, healthy, and just out of town.

I understand that 16th-century Verona is different from modern North America, but again, when I first read the play when I was 14, I understood Juliet's suffering.

It's empowering to reframe love as something you build with someone you admire, rather than something that happens to you without your control or consent.

It's still hard.

Love still feels completely infuriating and devastating at times. And when I feel really frustrated, I have to tell myself, my job in this relationship is to talk to my partner about what I want to create together.

This is also not easy.

But it's so much better than the alternative, which is kind of insane.

This version of love isn't about winning or losing someone's affection.

Instead, you should trust your partner and talk to them if you find it difficult to trust them. This sounds very simple, but it is actually some kind of revolutionary radical act.

This is because you can stop thinking about yourself and what you will gain or lose in your relationships and start thinking about what you have to offer.

This version of love allows you to say things like, "Hey, we're not very good collaborators. Maybe this isn't for us."

Or, "The relationship was shorter than I had planned, but it was still beautiful."

The beauty of a collaborative work of art is that it does not paint, paint, or sculpt itself.

This version of love allows us to decide what it is like.

thank you.

(applause)

As a child, I knew I had supernatural powers.

That is correct.

(Laughs) I thought it was really amazing that I could understand and empathize with brown people like my grandfather who was a conservative Muslim.

I also learned that my Afghan mother and Pakistani father, although not very religious, are laid-back and quite liberal.

And of course I was able to understand and empathize with how white people feel.

Caucasian Norwegians in my country.

I loved them all, white or brown or whatever.

I understood them all, even though we didn't always understand each other. They were all my friends.

But my father was always very worried.

He kept saying that no matter how well educated he was, he would never get a fair grade.

According to him, I will continue to face discrimination.

And the only way to be accepted by white people is to be famous.

Now remember, when I was seven years old, he had this conversation with me.

So when I was seven years old, he said, "Look, it must be sports or music."

Fortunately, it was music, because he knew nothing about sports.

So when I was 7 he collected all my toys and dolls and threw them all away.

Instead, he gave me a crappy little Casio keyboard and -- (laughter) yes. and singing lessons.

And he basically forced me to practice for hours every day.

Soon he had me perform to larger and larger audiences and, strangely enough, I became something of a symbol of Norwegian multiculturalism.

Of course I was very proud.

Because at this point the newspapers were starting to write good things about browns, and I felt my psychic powers growing.

So when I was 12 years old, I took a little detour while walking home from school to buy my favorite snack called "Salty Feet."

I know it sounds kind of awful, but I really love it.

They are basically little pieces of salty licorice in the shape of a foot.

I know how bad it is when I say it out loud now, but I still love them dearly.

So, on my way into the store, a grown white man blocked my way in the doorway.

So I tried to walk around him, and as I did, he stopped me and he was staring at me, spitting in my face, and he said, "Get out of my way, this little black bitch, this little Paki bitch, go home where you came from."

I was really scared.

i was staring at him.

I couldn't wipe the saliva off my face even though my tears were mixed with it.

I remember looking around, hoping that some adult would come and stop this man.

But instead people kept rushing past me and turning a blind eye.

I was so confused and was thinking, "Hey white people, where are you? What's going on?"

Why don't they come and help me? ”

Needless to say, I didn't buy any sweets.

I just went home as soon as possible.

I thought it was still okay.

Over time, as I became more successful, I eventually got harassed by brown people as well.

Some men in my parents' community felt that it was unacceptable and dishonorable for women to be involved in music or appearing in the media.

Soon, I started being attacked at my concerts.

I remember one concert. I was on stage, leaning over the audience, and the last thing I saw was a young brown face. And then I found out that some kind of chemical was thrown in my eye. I remember being really blind and my eyes were moist, but I kept singing.

On the streets of Oslo, I was spat in my face by brown men.

At one point they even tried to kidnap me.

The death threats continued endlessly.

I remember once an elderly bearded man stopped me in the street and said, "I hate you so much because you make our daughters think they can do anything they want."

A young man warned me to watch my back.

He said that music was un-Islamic, that it was the work of prostitutes, and that he would be raped and cut open so that no more prostitutes like you would ever be born again.

Again, I am very confused.

I couldn't understand what was going on.

My Brown now treats me this way -- why?

Instead of building a bridge between two worlds, two worlds, I felt depressed between two worlds.

For me, I think spit was kryptonite.

So by the time I turned 17, the death threats were constant and the harassment was constant.

It got so bad that at one point my mother sat me down and said, "Look, we can't protect you anymore, we can't protect you anymore, so you have to go."

So I bought a one-way ticket to London, packed my suitcase and left.

My biggest heartbreak at that point was that no one said anything.

I left Norway in a very official capacity.

Neither my brown nor white people said anything.

No one said, "Wait a minute, this is wrong."

Support this child, protect this child, because she is one of us. ”

No one said that.

Instead, I felt: At the airport baggage carousel, various suitcases are spinning, and there is always one suitcase left at the end. It's a suitcase that nobody wants and nobody wants.

I felt like that.

I have never felt so alone. I have never felt so lost.

So when I came to London, I ended up resuming my music career.

Different location, but unfortunately the same old story.

I remember messages being sent to me that I would be killed, that rivers of blood would flow, that I would be raped many times before I died.

I have to say at this point I was actually used to messages like this, but what has changed is that now they have started threatening my family.

So I packed my suitcase again, left music, and moved to the United States.

I had enough.

I didn't want anything to do with it anymore.

And I was never going to be killed by something I never dreamed of. It was my father's choice.

So I got a little lost.

Somehow it collapsed.

However, I decided that what I want to do is to spend the rest of my life supporting young people and try to contribute in any way I can.

I started volunteering in various organizations working with young Muslims in Europe.

And to my surprise, I found that many of these young people were suffering and struggling.

They faced many problems with families and communities that seemed to care more about their honor and reputation than their children's well-being and lives.

I began to feel that maybe I wasn't so lonely, maybe I wasn't so strange.

Maybe there are more of my friends.

The problem, which most people don't understand, is that many of us who grew up in Europe don't have the freedom to be ourselves.

We are not allowed to be who we are.

We are not free to marry or have relationships with people of our own choosing.

We can't even choose our own careers.

This is normal in European Muslim centers.

We are not free, even in the freest society in the world.

Our lives, our dreams, our futures do not belong to us, but to our parents and their communities.

I have found endless stories of young people lost from all of us, young people invisible to all of us who suffer and suffer from loneliness.

We are losing children to forced marriage, honor-based violence and abuse.

After working with these young people for several years, I finally realized that I could not keep running.

I don't think I can spend the rest of my life hiding in fear and I have to actually do something.

And I also realized that my silence, our silence, allowed this abuse to continue.

So I decided I wanted to tap into my childhood superpower by helping people on all sides of these issues understand what it's like to be a young person caught between family and country.

So I started making movies and telling these stories.

And I wanted people to understand that if we don't take these issues seriously, the consequences can be fatal.

So the first movie I made was about Banazs.

She was a 17-year-old Kurdish girl living in London.

She was obedient and did whatever her parents wanted.

She tried to do everything right.

She married the man her parents had chosen for her, but he beat and raped her constantly.

And when she tried to ask her family for help, they said, "Well, I have to go back and be a better wife."

Because he didn't want his divorced daughter in his possession. Because, of course, it would bring dishonor to the family.

She was beaten so badly that her ears bled, and when she finally left home and found and fell in love with a young man of her choice, known to the community and family, she disappeared.

She was found three months later.

She was packed in a suitcase and buried under the house.

She was strangled and beaten to death by three men, including three of her cousins, on the orders of her father and uncle.

What makes Banaz's story even more tragic is that she went to the British police five times to ask for help, telling her family that she was going to be killed.

The police did not believe her and did nothing.

And the problem is that so many children not only face these problems within their families and family communities, but they also encounter misunderstandings and apathy in the countries in which they grow up.

When our own family betrays them, they look to the rest of us, but when we don't understand, we lose our family.

So some people said to me while I was making this movie. "Well Diya, this is their culture, this is what they do to their children. We can't intervene too much."

I swear it's not my culture that you get killed.

Look?

And yes, people who look like me, young women who come from a background similar to mine should have the same rights, the same protections as the rest of this country, but why not?

So in my next film, I wanted to understand why some young Muslim children in Europe are drawn to extremism and violence.

But when it came to that topic, I also found myself having to face my greatest fear: a bearded brown man.

The same men, or men like them, who have haunted me for most of my life.

Men I have feared most of my life.

Men I also hated for years.

There I spent the next two years interviewing convicted terrorists, jihadists and former extremists.

What I already knew, and what was already very clear, was that religion, politics, the colonial baggage of Europe, and the failures of Western foreign policy in recent years were all part of the picture as well.

But I wanted to know more about what it means to be human and what are the personal reasons why some young people are so susceptible to these groups.

And what really surprised me was finding a wounded human.

Instead of the monsters I was looking for, hoping to find—frankly, it was so satisfying—I found broken people.

Just like Banaz, I found these young people torn in trying to bridge the chasm between their families and their countries of birth.

And what I have learned is that extremist and terrorist groups are exploiting these feelings of young people and channeling them – ironically – into violence.

"Come to us," they say.

"Reject both your family and your country because they reject you.

To your family, their honor is more important than yours, and to your country, a real Norwegian, Englishman or Frenchman will always be white, never you. ”

They also promise young people something they crave: meaning, heroism, a sense of belonging and purpose, a community that loves and accepts them.

They make helpless people feel powerful.

The invisible, the silent, finally becomes visible and audible.

This is what they are doing for our youth.

Why are these groups doing this for young people and not us?

The point is, I'm not trying to justify or condone violence.

My point is, we need to understand why some young people are drawn to this.

Actually, I want to show you this too, these are some boyhood photos from the movie.

What really struck me was that many of them – I never thought of that – but many of them had absent or abusive fathers.

And some of these young people ended up finding caring and compassionate fatherly figures among these extremist groups.

We also found men who were brutalized by racist violence but found ways to stop feeling victimized by being violent themselves.

In fact, to my horror, I found something familiar.

I felt the same feeling I had when I was 17 and fled Norway.

The same confusion, the same sadness, the same feelings of betrayal and belonging.

The same feeling of being lost and torn between cultures.

That said, I chose not to destroy, I chose to pick up a camera instead of a gun.

And the reason I did that is because of my psychic powers.

It turns out that understanding, not violence, is the solution.

To see humans with all their virtues and all their flaws, instead of continuing the caricature of us and them, villains and victims.

I also finally came to terms with the fact that my two cultures didn't have to collide, but rather became a space to find my own voice.

The feeling of having to choose one side is gone, but it took many years.

Today there are so many young people suffering from the same problem and they are suffering from this problem alone.

And this leaves them open like wounds.

And for some, the Islamic extremist worldview becomes an infection that aggravates open wounds.

There is an African proverb that says, "If young people do not enter a village, they will burn it down just to feel its warmth."

I would like to ask Muslim parents and members of the Muslim community, do you love and care for your children without forcing them to meet your expectations?

Can I choose them instead of my honor?

Do you understand why they are so angry and alienated when you put your honor before their well-being?

Can you help your child become the kind of friend who trusts you and wants to share their experiences with you instead of looking elsewhere?

And to young people seduced by extremism, can we admit that our anger is fueled by pain?

Can you find the strength to resist the cynical old men who want to use your blood for their own gain?

Can you find a way to live?

Do you know that the sweetest revenge is to live a happy, fulfilling and free life?

Life is defined by you, no one else.

Why would you want to be just a dead Muslim kid?

And when will the rest of us start listening to young people?

How can we help them direct their pain in a more constructive way?

They think we don't like them.

They think we don't care what happens to them.

They think we don't accept them.

Can't we find a way to make them feel differently?

What does it take for us to see them and recognize them before they become victims or perpetrators of violence?

Can we care for them and consider them ours?

And don't we just get furious when victims of violence look like us?

Can we reject the hate and find a way to heal the divide between us?

The problem is, even if they give up on us, we can't afford to give up on each other or our children.

We are all in this situation together.

And in the long run, revenge and violence will not work against extremists.

Terrorists want us to be terrified and congregate in our homes and shut our doors.

They want us to tear more wounds into society and use it to spread the infection more widely.

They want us to be as intolerant, hateful and cruel as they are.

A day after the attacks on Paris, a friend of mine sent me a photo of her daughter.

This is a white girl and an Arab girl.

they are best friends.

This image is Kryptonite for extremists.

These two girls with superpowers show us the way forward towards the society we need to build together, one that accepts and supports children rather than rejecting them.

Thank you for listening.

(applause)

For the last few years, I've been spending summers at the Marine Biology Laboratory in Woods Hole, Massachusetts.

So what I do is basically rent a boat.

All I want is to be on the boat with you tonight.

So we headed from Eelpond to Vineyard Sound, just off the coast of Martha's Vineyard, armed with a drone to identify potential Atlantic views.

Earlier I meant to say deep into the Atlantic, but you don't have to dive too deep to reach the unknown.

Here, just two miles away from perhaps the world's largest marine biology laboratory, we lower simple plankton nets into the water and bring to the surface what mankind rarely pays attention to and often has never seen before.

This is one of the creatures we caught in our nets.

This is a jellyfish.

However, a closer look reveals that inside this animal is very likely a completely new scientific organism.

Complete new breed.

Or what about this other transparent beauty whose heart beats, grows asexually to the crown of the head, and is the offspring that transitions to sexual reproduction?

Let me say it again. This animal reproduces asexually on its head, and offspring reproduce sexually in subsequent generations.

Weird jellyfish?

Not perfect.

This is a sea squirt.

This is the group of animals we now know share an extensive genomic ancestry and is probably our closest invertebrate species.

Meet your cousin Talia Democratica.

(Laughter) I know we didn't set aside a place for Talia at the last family gathering, but let me tell you, these animals are very much related to us in ways we're just beginning to understand.

So the next time you hear someone derisively say that this kind of research is just a fishing expedition, I hope you'll remember the trip we just took.

Today much of the biological sciences finds value only in studying more deeply what we already know, in mapping the continents already discovered.

But some of us are more interested in the unknown.

We want to discover a whole new continent and take in the magnificent vistas of ignorance.

We crave the experience of being completely baffled by something we've never seen before.

And yes, I agree there is a lot of little ego satisfaction in being able to say, "Hey, I was the first to discover it."

But this is not a business aimed at self-expansion. Because most of the time in this kind of discovery, if you don't feel like you're downright stupid, you're just not doing enough science.

(Laughter) And so each summer, I bring more and more things that we know very little to the deck of this little boat.

Tonight I want to tell you a story about life that is rarely told in this environment.

From the perspective of a 21st century biology lab, we have begun to unravel the many mysteries of life through knowledge.

After centuries of scientific research, we feel that we are beginning to make great strides in understanding the most fundamental principles of life.

Our collective optimism is reflected in the development of biotechnology around the world, which seeks to harness scientific knowledge to cure human disease.

Cancer, aging, degenerative diseases, etc. These are just some of the unwanted things we want to suppress.

I often wonder why we are having so much trouble solving our cancer problem.

Are we trying to solve the problem of cancer and not understand life?

Life on this planet has a common origin, and the 3.5 billion year history of life on this planet can be summarized in one slide.

Seen here are representatives of all known species on Earth.

In the midst of all this vast life and biodiversity, we are rather inconspicuous.

(laughs) Homo sapiens.

The last of our species.

And although we do not at all mean to despise the achievements of our species, although we wish to be, and often pretend to be, we are not the measure of all things.

But we are the measurers of many things.

We are constantly quantifying, analyzing and comparing, some of which are absolutely precious and actually necessary.

But today's emphasis on forcing biological research to specialize and produce practical results actually limits our ability to investigate life to an unacceptably narrow scope and satisfying depth.

We measure a surprisingly narrow life and hope that number saves all of our lives.

how narrow is it?

Okay, let me give you a number.

The National Oceanic and Atmospheric Administration recently estimated that about 95 percent of the ocean remains unexplored.

Let's think for a minute here.

95 percent of our ocean remains unexplored.

I think it's fair to say that we don't even know how much we know about life.

So it should come as no surprise that each week in my field I begin to see more and more new species added to this amazing Tree of Life.

This one, for example, was discovered earlier this summer and is new to science, but it now occupies a lone branch in our family tree.

Even more tragically, despite what we know about many other species of animals, their biology remains poorly studied.

I'm sure some of you have heard of the fact that starfish can regenerate even if they lose an arm.

However, some people may not know that the arm itself can actually regenerate a full starfish.

And there are animals that do some really amazing things.

Many of you have never heard of the flatworm Schmidtea mediterranea.

This little guy here basically does things that blow my mind.

If one of these animals is grabbed and cut into 18 different pieces, each of those pieces will regenerate a complete animal within two weeks.

18 heads, 18 bodies, 18 riddles.

For the past 15 years or so, I've been trying to understand how these little guys act and how they pull off this magical trick.

But like all good magicians, they don't reveal their secrets to me easily.

(Laughter) So we came here. After two decades of essential study of these animals, genome mapping, jaw scratching, and thousands of amputations and thousands of regenerations, we still don't fully understand how these animals behave.

Each planaria is itself an ocean full of unknowns.

One common trait of all these animals I've talked about so far is that they don't seem to get the memo that they need to act according to the rules we've drawn from the handful of randomly selected animals that now inhabit most of the biomedical laboratories around the world.

Meet the Nobel Prize winners.

Essentially, the seven species that have brought us the brunt of our understanding of biological behavior today.

This little guy here has won three Nobel Prizes in 12 years.

But after all the attention they've gathered, all the knowledge they've generated, and most of the funding, we're faced with the same cascade of intractable problems and many new challenges here.

That's because, unfortunately, these seven animals essentially represent 0.0009 percent of all species on Earth.

So I'm starting to suspect that our expertise is at best stifling progress, and at worst it's leading us astray.

Because life on this planet and its history is the history of rule-breakers.

Life began on this planet as single-celled organisms and swam in the oceans for millions of years, but one of them decided, ``Today, let's do something different.

I don't think it was a common decision at the time -- (Laughter) but somehow it managed to happen.

And multicellular organisms began to inhabit and thrive in all these ancestral oceans.

And here they are today.

Land masses began to emerge from the surface of the sea, and another creature thought, "Oh, this looks like a very nice piece of real estate.

I want to move there. ”

"are you crazy?

It will be dry there. Nothing can live outside water. ”

But life found a way, and now there are creatures that live on land.

Once on land, they might look up at the sky and say, "I wish I could go above the clouds, I'll fly away."

"You can't break the laws of gravity and you can't fly."

Yet nature has invented ways to fly independently many times.

I love studying animals that break the rules. Because every time they broke the rules, they invented something new that made it possible for us to be here today.

These animals did not receive the memo.

they break the rules.

Then, if we study animals that break the rules, shouldn't the research methods also break the rules?

I think we need to renew our spirit of inquiry.

Instead of bringing nature into our laboratories and investigating there, we need to bring our science into the grand laboratory of nature, where we use our modern technological arsenal to investigate every new form of life we ​​find and every new biological property we might find.

We really need to put all of our intelligence into it and become fools again. We must return to ignorance of the enormity of the unknown.

Because, after all, science isn't really knowledge.

Science is ignorance.

that's what we do.

Antoine de Saint-Exupéry once wrote: "If you want to build a ship, don't gather people together to gather wood, or assign them jobs and jobs, but teach them to long for the vast expanse of the sea..."

As a scientist and teacher, I would like to paraphrase this to read that we scientists need to teach our students to yearn for the vast ocean of our ignorance.

We Homo sapiens are the only species we know of that is driven by scientific inquiry.

Like all other species on this planet, we are closely woven into the history of life on this planet.

And I think it's a little bit wrong to say that life is a mystery. Because I think life is actually an open secret that has beckoned our species to understand it for thousands of years.

So I ask you: aren't we the best chance to know life itself?

If so, what are we waiting for?

thank you.

(applause)

Have you ever used electronic spreadsheets such as Microsoft Excel?

very good.

Now, how many of us have run a business manually with spreadsheets, like my father ran a small printing company in Philadelphia?

Much less.

Well, that's how it's been done for hundreds of years.

In early 1978, I started working on the idea that would eventually become VisiCalc.

And the following year it shipped to work with a new one called the Apple II Personal Computer.

Six years later, things really changed when The Wall Street Journal ran an editorial that assumed they knew what VisiCalc was and probably used it.

Steve Jobs said in 1990, "Spreadsheets moved the industry forward."

"VisiCalc has driven Apple's success more than any other event."

On a more personal note, Steve said, "If VisiCalc had been written for another computer, you would be interviewing someone else by now."

In short, VisiCalc helped put a personal computer on the business desk.

How did it come about?

what was that? What did I go through to make it happen?

I first learned to program in 1966, when I was 15 years old. Only two months after this photo was taken.

At that time, very few high school students could use computers.

But with some luck and a lot of perseverance, I found time to use the computer around town.

After sleeping in the mud at Woodstock, I went to MIT to go to college and worked on a Multics project to make money.

Multics is a pioneering interactive timesharing system.

Ever heard of Linux and Unix operating systems?

They are from Multics.

I worked on the Multics version of a language known as an interpreted computer language that people in non-computing fields use to sit at a computer terminal and do calculations.

After graduating from MIT, I got a job at Digital Equipment Corporation.

At DEC, he worked on a new field of software called computer typesetting.

I helped a newspaper company replace reporters' typewriters with computer terminals.

I wrote the software and then went out in the field to places like the Kansas City Star to train users and get feedback.

This was a very different real life experience than what I had seen in the lab at MIT.

After that, I was the project leader for DEC's first word processing software. This was also a new field.

As with typesetting, it was important to create a user interface that was natural and efficient, even for non-computer users.

After joining DEC, I worked for a small company that manufactured microprocessor-based electronic cash registers for the fast food industry.

But I've always wanted to start a company with my friend Bob Frankston, whom I met on the Multics project at MIT.

So I decided to go back to school to learn as much about business as possible.

In the fall of 1977, I entered the MBA program at Harvard Business School.

I was one of the small percentage of students with computer programming experience.

There's a picture of me sitting front row in a yearbook.

(Laughter) Well, at Harvard I studied the case method.

I handle 3 projects a day.

Cases consist of up to dozens of pages describing a specific business situation.

There are often exhibits, and the exhibits often have words and numbers arranged in a way that is appropriate for a particular situation.

Usually they are all slightly different.

This is my homework.

Again, numbers and words are laid out in a meaningful way.

A LOT OF CALCULATIONS -- We've gotten pretty close to calculators.

Actually, this is my calculator.

I tried to dress up as a calculator for Halloween.

(Laughter) At the beginning of each class, the professor asked someone to present the case.

What they did was explain what was going on, the professor transcribed the information on a number of electronic blackboards in front of the class, and then have a discussion.

One of the things that really annoys me is that after you've done all your homework, you come to school the next day and realize that you made a mistake and all the other numbers were wrong.

And you couldn't participate either.

And we were noted by our class participation.

So sitting there with the other 87 people in my class, I was able to daydream a lot.

Most programmers at the time worked on mainframes, building inventory systems, payroll systems, bill payment systems, and more.

But I was working on interactive word processors and on-demand personal calculations.

Instead of thinking about paper prints and punch cards, I imagined a magical blackboard, like a word processor with numbers, where you could erase one number and write a new one, and all the other numbers would automatically change.

I imagined a calculator with mouse hardware on the bottom and a heads-up display like a fighter plane.

You can also enter a number, circle it, and press the total button.

And in the middle of negotiations, I will be able to get an answer.

Now I had to turn my fantasy into reality.

My father taught me about prototyping.

He showed me a mockup he creates to place things on the page for a printed brochure.

And they used it to get customer feedback and OKs before sending jobs to the press.

The act of creating a simple, working version of what you're trying to build should reveal important issues.

And you can find solutions to those problems at a much lower cost.

So I decided to make a prototype.

I went to a video terminal connected to Harvard's time-sharing system and got to work.

One of the first problems I ran into was "How do I represent values ​​in formulas?"

Tell me what you mean

I thought you would point somewhere, type some words, then something else, type some numbers, type some more numbers, and point where you wanted an answer.

Then point to the first value, press minus, point to the second value, and the result is displayed.

The question was what to put in the formula.

It had to be something the computer knew what to type.

And when you look at a formula, you need to know where it refers to on the screen.

My first thought was that it's the way programmers do it.

The first time you specify somewhere, the computer will prompt you for a unique name.

It soon became apparent that it was too boring.

The computer had to automatically create the name and enter it inside.

So I wondered what would happen if I made them in the order in which they were created.

Tried it. value 1, value 2.

Having some values, I quickly learned that I couldn't remember where anything was on the screen.

So I said, instead of allowing values ​​to be entered anywhere, why not restrict them to a grid?

Then point to a cell and the computer will enter that row and column as the name.

And if you do it like a map, with the ABC on top and the numbers on the side, when you see B7 in the formula you'll know exactly where it is on the screen.

If you need to enter the formula yourself, you'll know how to do it.

Restricting to grid solved the problem.

It also opened up new features, such as the ability to set cell ranges.

However, it was not so restrictive. You could enter any value and any formula in any cell.

And that's how we do it today, almost 40 years later.

My friend Bob and I decided to build this product together.

I did some more work to understand exactly how the program works.

I have created a reference card to serve as documentation.

It also helped me to be able to concisely and clearly explain the user interface I was defining to the general public.

Bob worked in the attic of a rented apartment in Arlington, Massachusetts.

This is the inside of the attic.

Bob bought time on the MIT Multics system and wrote computer code on such a terminal.

Then he downloaded a test version over the phone line using an acoustic coupler to a borrowed Apple II, and then we tested it.

As one of these tests, I prepared this case for the Pepsi Challenge.

Printing was still not working so I had to copy everything.

Saving didn't work so I had to type all the formulas over and over again each time it crashed.

In class the next day, I raised my hand. I was called and filed a case.

I made a prediction five years ahead. I've done all sorts of scenarios.

I have admitted this lawsuit. VisiCalc was already useful.

The professor said, "How did you do that?"

Well, I didn't want to tell him about our secret program.

(Laughter) So I said, "Add this, multiply this, subtract that."

He said, "Then why didn't you use ratios?"

I said, "Ha! Ratio, that wouldn't be so accurate!"

What I didn't say is that the division is not working yet.

(Laughter.) But in the end, we had VisiCalc ready for public release.

My dad printed out a sample reference card that we can use as marketing material.

In June 1979, our publisher introduced VisiCalc to the world in a small booth at the giant National Computer Conference in New York City.

The New York Times published a humorous article about the conference.

"The machine performs what appears to be a religious ritual...

While the congregation gathers, in the Sign Room of the Coliseum, painters are building an addition to the Pantheon, carefully writing "VISICALC" in giant black on a yellow background.

Hurray, VISICALC!”

(gasps) The New York Times: "Hurray, VISICALC."

(Laughter) This was the last article about electronic spreadsheets in a general business press for about two years.

Most people still don't understand it.

But some did.

In October 1979 we shipped VisiCalc.

It arrived in a package like this.

Here's what it looks like when run on an Apple II:

And the rest, as they say, is history.

Well, there's a lot more to this story, but that'll have to wait for another day.

However, Harvard remembers one thing.

This is the classroom.

They put up a plaque commemorating what happened there.

(Applause.) But it's also a reminder that you, too, must consider your unique background, skills, and needs to build prototypes, discover and solve key problems, and change the world through them.

thank you.

(applause)

So, earlier this year, I got a call to do a TED Talk.

So I got excited, then panicked, then excited, then panicked, and started researching between excitement and panic. My research consisted mostly of googling how to give a good TED talk.

(laughter) Across that, I was googling chima mandangoji adichie.

How many people know who it is?

(Cheers) So I was googling her. Because I'm just a fan, but also because she always has important and interesting things to say.

And the combination of those searches kept leading me to her talk about the perils of a single narrative, what happens when you have a solitary lens for understanding a particular group of people, and it was the perfect talk.

If I had become famous first, that's the talk I would have given.

(Laughter) You know, she's African and I'm African, she's a feminist and I'm a feminist, she's a storyteller and I'm a storyteller, so I really felt like this was my story.

(Laughter) So I decided to learn how to code, hack the internet, delete every copy of the talk that existed, memorize it, come here and present it as if it was my talk.

So, the project was going pretty well, except for the coding part, until one morning a few months ago I was awakened by the news that the wife of a presidential candidate had given a speech. (Laughter.) (Applause.) That sounded eerie to another favorite of mine, Michelle Obama's speech.

(Cheers) So I decided to probably write my own TED talk, and that's what I'm here to do.

Here I would like to talk about my own observations about storytelling.

Of course, I want to talk about the power of stories, but I also want to talk about the limits of stories, especially for those of us who care about social justice.

Since Adichie gave that talk seven years ago, there has been a boom in storytelling.

Stories are everywhere. And I think there should be much to celebrate about having so many stories and so many voices thrive, even if there is danger in telling one boring old tale.

Stories are the antidote to prejudice.

In fact, today, any middle class connected over the internet can download stories with the touch of a button or swipe of the screen.

Listen to a podcast about how Dalits grow in Kolkata.

Hear Australian Aboriginal men talk about the challenges and triumphs of raising their children with dignity and pride.

Stories make us fall in love.

They heal cracks and fill trenches.

Stories even make it easier to talk about the deaths of people who don't matter in our society. Because stories make us care.

right?

I'm not sure, but I actually work at a place called Center for Stories.

And my job is to help tell stories that challenge the mainstream narrative about being Black, being Muslim, being a refugee, or any other category of things we talk about all the time.

But having come into this work through a long history of social justice activism, I'm very interested in people talking about non-fiction storytelling as if it were more than entertainment, or as a catalyst for social action.

It's not uncommon to hear people say stories make the world a better place.

But more and more, I worry that even the most poignant stories, especially those about people no one seems to care about, often get in the way of action for social justice.

Now, this is not because the narrator intends any harm.

Quite the opposite.

I think storytellers are mostly good people like you and me.

And storytellers' audiences are often deeply sympathetic and empathetic people.

Still, I'd suggest that stories aren't as magical as they seem, because good intentions can have unintended consequences.

There are three reasons why I believe stories don't necessarily make the world a better place. because it should always be three.

First, stories can create a sense of solidarity.

There's nothing like the feel-good factor that makes you feel like you've climbed that mountain or made friends with that death row inmate that you get when you hear a great story.

But you didn't.

you are not doing anything

Listening is an important step toward social behavior, but it is inadequate.

Secondly, I think we are often drawn to likable and human characters and protagonists.

This is a given, right?

Because if you love someone, you care about them.

But the opposite is also true.

If you don't like someone, don't care about them.

And if you don't care about them, you don't have to think you have a moral obligation to think about the circumstances that shaped their lives.

I learned this lesson when I was 14.

In fact, I've learned that you don't have to like someone to appreciate their wisdom, and you never have to like someone to stand by them.

So my bike was stolen while I was riding. (Laughter) It's possible if you're running slow enough. I was the same.

(Laughter) At one point, I was crossing this field in the Nairobi area where I was born and raised, and it seemed like a very bumpy road, and you don't want it to be like that when you're on your bike (Laughter).

I'm on the ground and I look up and see kids peddling in getaway vehicles. that's my bike He's about 11 or 12 years old. I'm sitting on the floor I'm crying because I saved a lot of money for my bike. Then get up and start screaming.

Instinct intervened and I started screaming "Thief, thief!"

Means "thief" in Swahili.

Then people come out of the woodworking shop and start chasing them.

This is Africa, so mob justice is enforced.

right?

And when I turned the corner, they got him, they got him.

The suspect was arrested, forced to return the bike, and made to apologize.

Again, typical African justice, right?

So they make him say sorry.

So we're standing there facing each other and he looked at me and said sorry but he stared at me with this uncontrollable anger.

he is very very angry

And this is the first time I've faced someone who doesn't like me just because of what I stand for.

He looks at me as if to say, "You're shiny, you're riding your bike, and you're mad at me?"

So it was a painful lesson that he didn't like me. But you know, he was right.

I was a middle class kid living in a poor country.

I had my bike and he had very little food.

Sometimes the messages we don't want to hear, the messages that make us want to crawl out of ourselves, are the messages we need to hear most.

While there are lovable storytellers who will steal your heart, there are hundreds more with slurred, ragged voices who just can't stand on stage in such fancy clothes.

There are countless tales of angry boys on bicycles, but you can't ignore them simply because you don't like the main character or he's not the kind of kid you want to bring home from an orphanage.

A third reason I believe stories don't always make the world a better place is that we often get so caught up in our personal stories that we forget to see the big picture.

So while we applaud when someone talks about feelings of shame, we don't necessarily associate it with oppression.

We nod with understanding when someone says they felt small, but we don't associate it with discrimination.

The most important narratives, especially for social justice, are those that do both, allowing us to explore and understand the personal as well as the political.

But it's not just about stories we like and stories we choose to ignore.

We live in a society where more and more powers are at work, and indeed news is beginning to replace news for many.

yes?

We live in an era where emotions rule and analyze as we see facts waning, but it's boring, right?

A place that cares more about what we feel than what we actually know.

According to a recent Pew Center report on American trends, only 10% of people under the age of 30 "have a lot of trust in the media."

Now, this is important.

It means that storytellers are gaining credibility at the very moment when many media professionals are losing public trust.

This is not good. Because stories are important and help us gain insight in many ways, but we also need media.

As a longtime social justice activist, I am well aware of the need for credible facts and strong voices of storytellers from media outlets.

That is what drives the needle forward in terms of social justice.

Ultimately, of course, it is justice, not stories, that make the world a better place. right?

So if what we're after is justice, I don't think we should focus on media or storytellers.

We have to focus on the audience, the people who have turned on the radio or listened to a podcast, all of us.

Here are some conclusions about what viewers can do to make the world a better place.

First of all, I think the world would be a better place if audiences were more curious and skeptical, asking more questions about the social context that gave birth to the stories they love.

Second, the world would be a better place if audiences realized that storytelling is an intellectual task.

And I think it's important that viewers demand more buttons from their favorite websites. For example, a button that says, "If you like this story, click here to support the cause the storyteller believes in."

Or, "Click here to contribute to Storyteller's Next Big Idea."

Often we focus on the platform, but not necessarily on the storyteller itself.

And finally, I think viewers can make the world a better place by turning off their phones, stepping away from their screens, and stepping out into the real world beyond where they feel safe.

Alice Walker said, "Look at the present you are building.

It should look like the future you dream of. ”

The narrator helps us dream, but it's up to all of us to plan for justice.

thank you.

(applause)

What do you imagine when you are asked to imagine the air?

Most people think of empty spaces, clear blue skies, and sometimes trees blowing in the wind.

And I remember my high school chemistry teacher wearing very long socks and sitting at the blackboard drawing diagrams of bubbles connected to other bubbles, explaining how bubbles vibrate and collide in some kind of frenetic soup.

But in reality, we often don't think much about air.

We become aware of it when there is an intrusion of some unpleasant sensation, such as a bad smell or something visible such as smoke or fog.

But it's always there.

It moves us all now.

It's even in us.

Our air is immediate, vital and intimate.

Yet it is so easy to forget.

So what is air?

It is an invisible combination of gases enveloping the Earth, attracted by the Earth's gravitational pull.

And although I am a visual artist, I am interested in the invisible in the air.

I am interested in how we imagine it, how we experience it, and how we innately understand its materiality through breathing.

All life on Earth transforms the air through gas exchange, and we are doing just that right now.

In fact, let's all take a big, deep breath together right now.

Ready? of. (inhales) and out. (Exhale) That air you just exhaled is 100 times more concentrated carbon dioxide.

That means about 5 liters of air per breath, 17 breaths per minute out of 525,600 minutes per year, and about 45 million liters of air enriched 100 times with carbon dioxide are yours.

That's the equivalent of about 18 Olympic-sized swimming pools.

Air is plural for me.

It is as small as our breath and at the same time as large as the earth.

And it's kind of hard to imagine.

Maybe it's not possible and maybe it doesn't matter.

Through my visual art practice, I try to make air more intuitive, tactile, tactile than imaginable.

I try to expand this notion of aesthetics, or how things look, to include things like how it feels in your skin and your lungs, how your voice sounds as it passes through you, and so on.

I explore weight, density, smell, but most importantly, think about the stories we give to different types of air.

This is a work I made in 2014.

It was called 'Different Kinds of Air: A Diary of Plants' and I recreated air from different epochs of the Earth's evolution and invited the audience to come in and breathe with me.

And it's really amazing and dramatically different.

I'm not a scientist, but atmospheric scientists look for traces of geological air chemistry, much like how rocks oxidize, and extrapolate and aggregate that information to almost create a recipe for the air at different points in time.

Then I join as an artist to recreate that recipe using ingredient gases.

I was particularly interested in air that is not only an example of a moment when life changes air, but which, like Carboniferous air, can influence how life evolves.

That's about 300 to 350 million years ago.

It's called the Age of Giants.

Thus, for the first time in the history of life, lignin evolves.

It's the hard substance that makes up wood.

So the trees effectively invented their own trunks at this time of year, got very big, got bigger and bigger, released oxygen, released oxygen, released oxygen to spread over the earth, and oxygen levels were about double what they are now.

And this rich air supports giant insects - giant spiders and dragonflies, whose wingspan is about 65 centimeters.

Breathing this air is really clean, really fresh.

It doesn't taste like much, but it gives the body a really subtle kind of energy.

Really good for hangovers.

(Laughter) Or there's a great atmosphere of death. That was about 252.5 million years ago, just before dinosaurs evolved.

Geologically speaking, it's a very short period of time, about 20 to 200,000 years.

Really early.

This is the largest extinction event in Earth's history, even bigger than the extinction of the dinosaurs.

Currently, 85 to 95 percent of species are extinct, accompanied by a dramatic surge in carbon dioxide, which many scientists agree is a simultaneous volcanic eruption and runaway greenhouse effect.

At this time, the oxygen concentration will be less than half of what it is today, that is, about 10 percent.

So this air can't sustain human life, but it's fine for breathing.

And when you breathe, it's strangely comfortable.

Very soothing, very warm, with a slightly soda-like flavor.

It has such a splash and is very pleasant.

After thinking about the air of the past, it is only natural to start thinking about the air of the future.

And instead of speculating about air, or just building up what might be the air of the future, we discovered this human-synthesized air.

This means that it does not exist anywhere in nature and is created by humans in laboratories for applications in a variety of industrial settings.

Why Future Air?

This air is a very stable molecule that, once released, literally becomes part of the air for the next 300-400 years until it decomposes.

In other words, about 12 to 16 generations.

And this futuristic air has a very sensual quality.

It's very heavy.

It is about eight times heavier than the air we normally breathe.

In fact, it's so heavy that when you breathe it in, literally every word you speak is so heavy that it drips from your jaw, falls to the floor, and seeps into the cracks.

It is air that acts very much like a liquid.

Now, this atmosphere also has an ethical dimension.

Although this air is man-made, it is also the most potent greenhouse gas ever tested.

Its warming potential is 24,000 times that of carbon dioxide and it has a lifespan of 12 to 16 generations.

This ethical conflict is therefore the true center of my work.

(lowering voice) It also has an amazing quality.

The timbre of the voice changes dramatically.

(Laughter) So when you start thinking – oh! There is still a little left.

(Laughter) When we think about climate change, we probably don't think about giant insects or volcanic eruptions or funny voices.

An image that comes to mind more easily is that of a polar bear drifting over a receding glacier or iceberg.

We think of pie charts, column charts, and politicians who wear cardigans and talk endlessly to scientists.

But perhaps it's time to start thinking about climate change on the same visceral level that we experience air.

Like air, climate change simultaneously spans molecular, respiratory, and global scales.

It is immediate, essential, and intimate, but also amorphous and unwieldy.

Yet it is so easy to forget.

Climate change is the collective self-portrait of humanity.

It reflects our decisions as individuals, as a government and as an industry.

And if there's one thing I've learned from watching the air, it's that even though it's changing, it persists.

It may not support the kind of life we ​​perceive, but it will support something.

And if we humans are such an important part of that change, I think it's important to be able to feel the arguments.

Humans leave very living traces in the air, even if they are invisible.

thank you.

(applause)

One of the kingdom's most prosperous merchants has been exposed in a corrupt trade.

Nearly all of his wealth has been invested in a collection of 30 exquisite Burmese rubies, and crowds in the square are clamoring for their confiscation in order to refund the victims.

However, the thug and his associates made a convincing case in court that at least part of his wealth was earned legally and through good service to the King.

The king thinks for a moment and makes a decision.

There is no way of knowing which part of the ruby ​​was purchased with ill-gotten wealth, so the fine is determined by a game of wits between the merchant and you, the king's wisest adviser.

You can tell each other the rules in advance.

The merchant can carefully divide the rubies into 3 crates, which are placed in front of you.

You are given three cards and you must write a number from 1 to 30 on each before placing the card in front of each box.

After that, all the boxes can be opened.

If each box contains the same number of rubies as indicated on the corresponding card, you will receive that number of rubies.

But if your number is greater than the number of rubies that are actually there, the rogue will keep the whole box.

The King imposes only two restrictions on how the villains distribute the rubies.

Each box must contain at least 2 rubies, and one of the boxes must contain exactly 6 more rubies than the other, but I don't know which one.

After a few minutes of deliberation, the merchant hides the jewels and a chest is brought before you.

What numbers should be chosen to guarantee the highest possible fines for the bad guys and the highest compensation for the victims?

Pause the video now if you want to figure it out for yourself.

Answer with 3 Answer with 2 Answer with 1 Be careful not to get too greedy.

However, there is a guaranteed way to get more than half of the villain's stash.

This situation is similar to an adversarial game like chess, but here the opponent's position is invisible.

To figure out the minimum number of rubies you can reliably get, you need to look for worst-case scenarios, as if the merchant already knew your move and could arrange rubies to minimize your winnings.

There is no way to know which box has more or less rubies, so you must choose the same number for each.

Suppose you wrote three 9s.

A rogue could have assigned rubies 8, 14, and 8.

In that case you get 9 from the middle box and nothing else.

On the other hand, we can confirm that at least two boxes contain at least 8 rubies.

Here's why.

First, let's assume the opposite, that there are 7 or less in the two boxes.

All boxes must contain at least 2 rubies, so these two cannot be 6 different.

The third box would then contain up to 13 rubies (7 plus 6).

Adding up all three boxes gives a maximum of 27.

This is less than 30, so this scenario is not possible.

Now, by what we call a contradiction proof, we know that two of the boxes contain 8 or more rubies.

If you request 8 from all 3 boxes, you will receive at least 16. Considering the 8, 14, 8 scenario again, this is the best value we can guarantee.

You have recovered more than half of the villain's fortune as reparations to the world.

And while he manages to keep a piece of Ruby, his fortune has definitely lost some of its luster.

Cybercrime is out of control.

it is everywhere.

we hear about it every day.

Over 2 billion records were lost or stolen this year.

And last year, 100 million people (mostly Americans) lost their health insurance data to thieves, myself included.

What's particularly concerning about this is that in most cases it's not even months before someone reports that these records have been stolen.

So if you watch the evening news, you would think most of it is espionage or state activity.

And, well, part of it is.

As you know, espionage is an internationally recognized practice.

But in this case, that's only part of the problem we're dealing with.

How often do you hear "...it was the result of a sophisticated state-of-the-art attack" after a breach?

In many cases, it's that companies don't want to acknowledge their lackluster security practices.

There is also the widely held belief that blaming attacks on nation-states will alienate regulators, at least for some time.

So where did all this come from?

The United Nations estimates that 80 percent are due to highly organized and ultra-sophisticated criminal gangs.

To date, it represents one of the world's largest illicit economies, with a top of $445 billion.

I want you to put this into perspective, $445 billion is more than the GDP of 160 countries including Ireland, Finland, Denmark, Portugal and others.

So how does this work?

How do these criminals behave?

Now let me tell you a little story.

About a year ago, our security researchers tracked a somewhat mundane but sophisticated banking Trojan called Dyre Wolf.

Dyre Wolf gets onto your computer by clicking on links in phishing emails that you probably shouldn't be visiting.

Then sit and wait.

Wait until you log into your bank account.

Then bad guys break in and steal your credentials and use them to steal your money.

This sounds terrible, but in reality this form of attack is somewhat common in the security industry.

However, Dyre Wolf had two distinctly different personalities. One was for these smaller transactions, but it took on a completely different character when making large wire transfers.

what will happen?

When you initiate the process of issuing a wire transfer, your browser will display a screen from your bank stating that there is a problem with your account, that you need to call your bank immediately, and a phone number for your bank's fraud department.

So you pick up the phone and make a call.

After going through the usual voice prompts, an English-speaking operator appears.

"Hello Alto Mutual Bank. Can I help you?"

Then, just like when you call a bank, tell them your name and account number, undergo a security check, and go through the process of confirming your identity.

Most of us may not know this, but many large wire transfers require two people to sign off on the wire transfer, so the operator asks for a second person to be put on the line and goes through the same series of verifications and checks.

Sounds normal, right?

There is only one problem. I didn't talk to the bank.

You are talking to criminals.

They had built an English-speaking helpdesk and a fake overlay to the bank's website.

And this was executed so perfectly that they were moving $500,000 to $1.5 million per attempt into the crime vault.

These criminal syndicates operate like tightly controlled, legitimate businesses.

Employees work from Monday to Friday.

They have weekends off.

How do we know this?

That's because our security researchers repeatedly saw a spike in malware on Friday afternoon.

The bad guys are back after a long weekend with their wives and kids to see if things are going well.

The dark web is where they spend their time.

It's a term used to describe the anonymous dark side of the Internet, where thieves can remain anonymous and operate without detection.

They sell attack software and share information about new attack techniques here.

You can buy everything from basic level attacks to more advanced versions there.

In fact, in many cases, service levels even reach Gold, Silver, and Bronze.

You can check references.

You can even buy the attack with a money-back guarantee if it doesn't work (laughs).

Now, these environments, these marketplaces look like Amazon and eBay.

You'll see products, prices, ratings, and reviews.

Of course, if you're buying an attack, you're buying from a reputable criminal with a good reputation, right?

(Laughter) It's no different than checking Yelp or TripAdvisor before going to a new restaurant.

Here is an example.

This is an actual screenshot of a vendor selling malware.

Note that these are vendor level 4 and trust level 6.

There were 400 positive reviews last year, but only 2 negative reviews last month.

It also shows the license terms.

Here are some examples of sites you can visit if you want to change your identity.

They sell fake IDs and fake passports.

However, please note that there are legally binding terms for purchasing fake IDs.

give me a break

What are they going to do? Will they sue if they violate?

(Laughter) This happened a few months ago.

One of our security researchers was investigating a new Android malware application we discovered.

It was called Bilalbot.

In a blog post, she positioned Bilal Bot as a new, cheaper beta alternative to the much more sophisticated GM bots that were common in the criminal underworld.

This review was not liked by the creators of Bilal Bot.

So they wrote her this email, pleading their case and claiming that they felt she appreciated the older version.

They asked her to update her blog with more accurate information and even offered to interview her to elaborate on how their attack software was far superior to its competitors.

You don't have to love what they do, but you do need to respect the entrepreneurial spirit of their efforts.

(Laughter.) So how do we stop this?

It is not possible to identify who is responsible. Remember, they remain anonymous and operate outside the law.

Certainly we will not be able to prosecute criminals.

I would suggest that a completely new approach is needed.

And that approach needs to be centered around the idea that the economy needs to change for the bad guys.

And to give some perspective on how this might work, consider our response to medical pandemics such as SARS, Ebola, bird flu, and Zika.

What are your top priorities?

It's about knowing who is infected and how the disease is spreading.

Now governments, private institutions, hospitals, doctors, everyone is responding frankly and quickly.

This is a collective and altruistic effort to stop the spread of the disease and inform uninfected people how to protect themselves and how to get vaccinated.

Unfortunately, this is not what we see in response to cyberattacks.

Organizations are much more likely to keep information about their attacks confidential.

why?

Because they are concerned about competitive advantage, litigation and regulation.

We need to effectively democratize threat intelligence data.

We need all these organizations to open up and share what they have in their personal vaults.

The bad guys are moving fast. We must move faster.

The best way to do that is to openly share data about what is happening.

Think of this in the framework of a security professional.

Remember, they are programmed directly into their DNA to keep secrets.

We have to turn that idea upside down.

We need governments, private agencies, and security companies to share information quickly.

Here's why. Because sharing information is equivalent to vaccination.

And if you don't, you're actually part of the problem, as other people are more likely to be affected by the same attack techniques.

But there are even greater benefits.

Destroy criminals' plans by destroying their devices in near real time.

We will let people who are going to hurt know much sooner than they expected.

We ruin their reputation and kill their ratings and reviews.

We try not to pay for cybercrime.

We change economics for the bad guys.

But to make this happen, we needed someone to act first, someone who would change the way the entire security industry thinks.

About a year ago, a colleague and I had a revolutionary idea.

What if IBM took our data (we have one of the largest threat intelligence databases in the world) and made it public?

It contained information not only about what happened in the past, but what was happening in near real time.

What if we published it all openly on the Internet?

As you can imagine, this had quite the reaction.

The lawyer came first. What are the legal implications of doing so?

Then it was time to talk about business. What impact will doing that have on your business?

And this has been met with a fair amount of people asking if we are completely insane.

But of all the dialogue we have, there's one that keeps popping up. It's the realization that if we don't do this, we too become part of the problem.

So we did something unprecedented in the security industry.

Publishing has started.

Over 700 terabytes of actionable threat intelligence data, including information about real-time attacks that can be used to stop cybercrime.

And to date, more than 4,000 organizations, including half of the Fortune 100 companies, are using this data.

And our hope as a next step is to have all these organizations join the fight against us and do the same, sharing information about when and how they are being attacked.

We all have the opportunity to stop it, and we already know how.

All we have to do is look at the response we are seeing in the medical world and the response to the pandemic.

Simply put, we need to be open and collaborative.

thank you.

(applause)

So perhaps you feel, like most people, that the polarization is worsening in our country, that the divide between left and right is the worst we've ever lived.

However, some may wonder if the research supports your intuition.

In a nutshell, the answer is sadly “yes”.

Study after study shows that the gulf between liberals and conservatives is widening.

Increasingly, they are isolating themselves within these ideological silos, consuming a variety of news, conversing only with like-minded people, and increasingly choosing to live in different parts of the country.

And I think the most worrying thing about it is the growing animosity on both sides.

Liberals and conservatives, Democrats and Republicans, hate each other more and more.

You can see it in different ways.

They don't want to be friends with each other. They don't want to date each other.

It's a particularly shocking statistic that more and more people find themselves less attractive to each other when they get married, and when they find out about it, and don't want their children to marry someone who supports them.

In my lab, the students I work with talk about certain social patterns. I'm a movie buff, so I often wonder, "What kind of movie is this pattern here?"

So, what kind of movies are we watching in the midst of political polarization?

Well, it could be a disaster movie.

It certainly looks like a disaster.

It could be a war movie.

also fits.

But what I always think is, we're in a zombie apocalypse movie.

(laughs) Right? you know the kind

There are people walking around in packs without thinking for themselves, trapped in a collective mentality that seeks to spread their disease and destroy society.

And maybe you, like me, think you're the good guy in the zombie apocalypse movie, and all this hatred and polarization is propagated by other people, because we're Brad Pitt, right?

Free-thinking, righteous, just trying to protect what we hold dear, not foot soldiers in an undead army.

Do not.

Not at all.

But the question is, what movie do you think they're in?

right?

Well, they absolutely think they're the good guys in the zombie apocalypse movie. right?

And they better believe they think they're Brad Pitt and we're zombies.

And who can say they are wrong?

I think the truth is that we are all part of this problem.

And the upside is that we can be part of the solution.

So what shall we do?

How can we gradually reduce the polarization in our daily lives?

What can be done to connect and communicate with political stakeholders?

Well, these are exactly the questions that intrigued me and my colleague Matt Feinberg a few years ago, and we started researching on the subject.

And one of the first things we've found really helpful in understanding polarization is understanding that our country's political divisions are underpinned by deeper moral divisions.

Thus, one of the most robust findings in the history of political psychology is this pattern, identified by psychologists John Haidt and Jesse Graham, that liberals and conservatives tend, to varying degrees, to support different values.

For example, liberals were more likely than conservatives to support values ​​such as equality, fairness, consideration and protection from harm.

And conservatives are more likely than liberals to support values ​​such as loyalty, patriotism, respect for authority, and moral purity.

And Matt and I thought perhaps this moral divide might help us understand how liberals and conservatives talk to each other, and why they seem to pass each other when they do.

So we conducted a study that brought liberals together in a study of writing persuasive essays to persuade conservatives in favor of same-sex marriage.

And what we found is that liberals tend to base their arguments on liberal moral values ​​of equality and fairness.

So they said things like "everyone should be entitled to love whoever they choose," and that "they" -- they're gay Americans -- "deserve the same rights as other Americans."

Overall, we found that 69 percent of liberals cited one of the more liberal moral values ​​and only 9 percent cited one of the more conservative moral values ​​when structuring their essays, even though they should be trying to persuade conservatives.

And when we study conservatives and force them to make a convincing argument in favor of making English the official language of the United States, a classic conservative political position, we find that they are no better at this.

Fifty-nine percent of them argued for one of the more conservative moral values, and only 8 percent brought up liberal moral values, even though liberals were supposed to be persuaded.

Now, it's easy to see why we're running into trouble here. right?

People's moral values ​​are their most deeply held beliefs.

People are willing to fight and die for their values.

Why would they give it up just to agree with you on something they specifically don't want to agree with you?

If that persuasive appeal you're making to your Republican uncle means that not only does his views need to change, but so do his underlying values, it won't have much effect.

So what would be more effective?

We believe this is a technique called moral reframing, and have studied it in a series of experiments.

One of these experiments involved liberals and conservatives in a study and asked them to read one of three essays before surveying their environmental attitudes.

And the first of these essays was a relatively traditional environmental essay that evoked liberal values ​​of consideration and protection from harm.

"In many important ways, we are causing real harm to the places we live in," he said. "It is imperative that we take action now to prevent further damage to our planet."

Another group of participants was assigned to read an entirely different essay designed to capitalize on conservative values ​​of moral purity.

It was also an essay about environmental protection, saying things like "Keeping our forests, drinking water and skies clean is extremely important."

"We should think that pollution in the places we live in is disgusting."

And "Reducing pollution helps preserve the purity and beauty of the places we live in."

And there was a third group assigned to read only non-political essays.

This was just a comparison group so that we could get a baseline.

Later, when I researched how people think about the environment, I discovered that for liberals, it doesn't matter which essay you read.

In any case, they tended to have a very ecological attitude.

Liberals are committed to environmental protection.

However, conservatives were significantly more supportive of progressive environmental policies and conservation when they read the moral purity essay than when they read either of the other two essays.

We also found that conservatives who read this ethical purity essay were significantly more likely to say they believed in global warming and were concerned about it, even though the essay didn't even mention it.

It is simply related to environmental issues.

But that's how strong this moral restructuring effect was.

And we have studied this across a wide variety of political issues.

So if you want to garner conservative support on issues such as same-sex marriage or national health insurance, it helps to link these liberal political issues with conservative values ​​like patriotism and moral purity.

And we also studied it in another way.

If you want to push liberals to the right on conservative policy issues such as military spending or making English the official language of the United States, you will be more persuasive if you link those conservative policy issues with liberal moral values ​​such as equality and fairness.

All these studies have the same clear message. In other words, if you want to persuade someone about a policy, it helps to tie that policy to its underlying moral values.

And when put like that, it seems really obvious. right?

For example, why are you here tonight?

Why -- (Laughter) It's incredibly intuitive.

Even so, that's what we really struggle with.

It turns out that when we persuade someone on a political issue, we talk like we're talking to a mirror.

We practice our own reasons over and over as to why we believe certain political positions, so there isn't much to convince.

In designing these reframed moral arguments, we kept saying "empathy and respect, empathy and respect."

If you can use it, you can make connections and maybe persuade someone in this country.

So when I think again about the movies we're in, maybe I used to be obsessed.

Perhaps it's not a zombie apocalypse movie.

Perhaps instead, it's a buddy cop movie.

(Laughter) Just roll it, just follow it.

(Laughter.) There may be white cops and black cops, or messy cops and organized cops.

Either way, they don't get along because of this difference.

But ultimately, when the need arises for them to band together and work together, the sense of solidarity they feel is even greater thanks to the chasm they have had to cross. right?

And remember, in these movies, it usually gets worst in the second act, when the leads are farther apart than ever.

And maybe that's where we are in this country, late in the second act of the Buddy Detective movie, (laughs) being torn apart but trying to come together again.

It sounds good, but I think the responsibility starts with us if we want it to happen.

This is my call to you. Let's restore this country.

Let's do it despite politicians, the media, Facebook, Twitter, congressional redistricting and everything else that divides us.

Let's do it because it's right.

And let it be, because this hatred and contempt that flows through all of us every day makes us ugly, corrupts us, and threatens the very fabric of our society.

We owe it to each other and to our country to reach out and connect.

We can't hate them anymore, and we can't let them hate us.

empathy and respect.

empathy and respect.

Come to think of it, that's the least we can owe to our people.

thank you.

(applause)

Let me tell you a little bit about how I got started. It actually has a lot to do with happiness.

When I was little, I was very introverted and thought a lot about myself.

And as a means of survival, I got into my own very personal space and made stuff.

I make things for people as a way to show and give love to them.

I was like learning how to go into these private places and put my ideas and passions into objects and speak with my hands.

So the whole activity of making things with our hands is very closely related not only to the realm of ideas, but also to the realm of emotions.

And the way of thinking is very different.

I'm going to show you a lot of different types of work, but there's no real connection between them. It's just different kinds of thoughts triggered by observing life, nature, objects, just having playful, random thoughts about things, except that they're just things that came out of my brain.

As a child, I started exploring movement.

I fell in love with the movement of things, so I started exploring movement by making little flipbooks.

This is something I did, probably around 1st grade. As I was doing this, I remember thinking about the little rocks there, the paths of the flying vehicles, and the characters [laughs] jumping out of the cars. So in my head I was thinking about the trajectory of the vehicle.

And of course there is always destruction at an early age.

So I have to stop -- (laughter) -- gratuitous violence.

(Laughter) So I started exploring how things work and expressing that.

Well, when I went to college, I found myself building rather complicated and fragile machines.

And this really came out of having different kinds of interests.

When I was in high school, I loved programming computers, so I liked the logical flow of things.

Also, I was probably very interested in going into the field of surgery and becoming a surgeon. Because it means working with great concentration and dedication.

So, I started taking art courses and found a way to create sculptures that brought together my love of working out different kinds of logical energy flows through systems and using my hands with great precision.

Also working with wires, everything I did was a visual and mechanical decision at the same time.

So I was able to kind of practice them all.

Now, this kind of machine is very close to painting for me.

And then there are the little feet, just dragging in circles, and so many little, trivial endpoints that don't really mean anything.

It's really about making the little things in themselves a kind of joy.

My connection to engineering is like any other engineer in that I love solving problems.

I love figuring things out, but the end result of what I'm doing is really completely vague.

(Laughs) That's pretty vague.

(Laughter) The next piece I'm going to show you is an example of a kind of machine that's pretty complicated.

I gave myself a problem.

I always like to solve problems, so I set myself the problem of solving all the mechanical problems to turn the crank in one direction and make this little guy walk back and forth.

So when I started doing this, I didn't have a general plan for the machine, but I did have a sense of the gestures, the shape, and how it would take up space.

And it was important to start at a point and build towards the final point.

A small gear there switches back and forth to change direction.

And it's a small pick-me-up.

So many of the pieces I make include finds.

And it's really like doing visual puns all the time.

When I see things, I imagine them moving.

Imagine what you can say with them.

The next "machine with wishbone" was born from playing with this wishbone after dinner.

People tell me not to play with food, but I always play with things.

So I had this wishbone and thought it was like a cowboy riding a horse too long.

(Laughter.) And I started making him walk across the table and I was like, 'Oh, I can build a little machine that does that.'

So, if you make this device and connect it, the wishbone will walk.

And wishbones are bones and animals, so that's kind of the point where we think we can get into that.

that's the whole thing.

(laughs) It's that big.

(Applause.) This kind of production is a lot like a puppet show. I am the puppeteer at first, because the objects found are, in a sense, puppets and I am playing with them.

But then I build a machine that takes my place and does what I want.

The next piece I'll show you is a more conceptual idea, a small piece called 'Cory's Yellowchair'.

This image popped into my head when I saw my son's little chair. Then I saw it explode and fly out.

And the first time I saw this in my head, it was to the point where the pieces exploded at infinite velocity, traveled far, and then began to pull back with some sort of sense of gravity, returning to the center at infinite velocity.

And they coalesce for a split second, so you can recognize the chair there.

For me, it's kind of a feeling about the transience of the present moment, and that's what I wanted to express.

Well, the machine, in this case, is a real approximation of that. Because obviously you can't move physical matter infinitely at infinite speed and stop it instantly.

The overall width of this is about 4 feet and the chair itself is just a few inches.

(Applause) Okay, this is a funny conceptual thing, but yesterday we were talking about Danny Hillis' 10,000 Year Clock.

On the left here is the motor, passing through the gear train.

Twelve pairs of 50:1 deceleration means that the end gears have very slow final velocities, so it takes 2 trillion years to make one revolution.

It's not very important, so I thought about it specifically.

(laughs) Because I can run anytime.

(Laughter) Well, it's a completely different idea.

I always imagine myself in different situations.

I imagine myself as a machine.

what would i love

I want to bathe in oil.

(Laughter) So this machine is just getting oiled.

(Laughter.) (Applause.) And it's really just a little thing, but for me it was just about the lusciousness of the oil.

(Laughter) And then a friend called me who wanted to do an erotic art show, but I didn't have any work.

However, this production came to mind when she suggested an appearance on the show.

I mean, it's kind of relatable, but it turns out to be more overtly erotic.

And this is what I call a "greased machine".

It just ejaculates continuously and it -- (laughter) -- this is a happy machine, let me tell you.

(Laughs) I'm really happy.

From an engineering standpoint, this is just a four bar linkage.

And also, this is a pick-me-up, a little fan I found.

Then I thought about the action of opening a fan, how to say something in a simple way.

And in cases like this, I'm trying to make something that's explicit but doesn't suggest a particular kind of animal or plant.

Process is very important to me. Because I'm inventing the machine, but I'm also inventing the tools to make the machine, so it's all complete from the beginning.

This is a small wire bending tool.

After years of bending gears with pliers, I made that tool and then another tool like gear centering very quickly. It's like I developed my own little tech world.

My life changed completely when I encountered a spot welder.

(Laughter) That was the tool.

It completely changed what I could do.

Now, from here on, we will do the very poor work of silver brazing.

This is not how schools teach silver soldering.

I like it, please throw it

So a real jeweler puts a little bit of solder.

So, here is the finished gear.

When I moved to Boston, I joined a group called the World Sculpture Racing Association.

(Laughter) And the idea, their premise, was that we wanted to exhibit sculptural work on the street, and there was no subjective decision as to what was best.

The winner is whoever crosses the finish line first.

(Laughter) So I built - this is my first racing sculpture, and I thought, 'Oh, I built a kart and thought I'd get one - I'm going to write 'Faster' on my hand, so when I'm driving down the street, the kart will talk to me and say, 'Faster, faster! "So that's what it is.

(Laughter) But in the end, I decided that every time you finished writing that word, I would stop and give the card to someone on the side of the road.

You can't win a race because you're always stuck.

But it was a lot of fun.

(Applause) Well, we've only got two and a half minutes, so I'm going to play this.

This work is the most complete work for me.

Because when I was a kid, I used to play the guitar a lot too.

And when I had this idea, I envisioned myself making - I'd make a machine theater night, where I would - there would be an audience, the curtains would open, and the machines on stage would entertain you.

So I imagined a very simple gestural dance between a machine and a simple chair.

When I make these pieces, I'm always trying to find a point that states something very clearly, it's very simple, but it's also very vague at the same time.

And I think there's a point between simplicity and ambiguity that viewers can probably get something out of it.

And I've come to the idea that all these pieces start in my head, in my heart, and I'm doing my best to find a way to express that in material, but it always feels really crude.

It's always a struggle, but I managed to get this idea down into an object and it's there.

It makes no sense at all.

The object itself has no meaning.

When it is perceived and someone brings it into their mind, the cycle is complete.

And for me that's the most important thing. Because ever since I was a kid, I wanted to convey my passion and love.

And that means the complete cycle of going from the inside to the outside and to someone who perceives it.

Now let me take this chair down.

(Applause.) Thank you.

(applause)

I am a relationship builder.

When you think of someone who builds relationships, do you automatically think of “architects”?

Probably not.

Because most people think of architects as designing buildings and cities, but because cities are people, what we really design is relationships.

It is a place where people gather and all kinds of interactions take place.

Additionally, Skyline is a very special urban habitat, with its own insects, plants, animals, and even its own weather.

Today, however, urban habitats are out of balance.

Climate change is having an impact, along with political and economic issues. They add up and stress the city and those of us who live in it.

For me, the field of ecology has provided important insights. Ecologists don't just look at individual species in isolation, they look at the relationship between organisms and their environment.

They look at how all the diverse parts of an ecosystem are interconnected, and it is this balance, the web of life, that actually sustains life.

My team and I have applied insights from ecology to architecture to consider how physical space can help build stronger relationships.

Today's project uses the idea of ​​building relationships as a primary driving force in its design.

Here's an example of what I mean.

We were recently commissioned to design a social justice leadership center called the Arcus Center.

They asked us for a building that would break down traditional barriers between different groups and, in doing so, create the potential for meaningful conversations around social justice.

Students were looking for a place for cultural exchange.

They figured a place where they would prepare meals together would make that possible.

And they wanted to welcome the outside community.

They thought the fireplace would draw people in and help start a conversation.

And everyone wanted social justice efforts to be visible to the outside world.

There was no precedent for this kind of space, so we searched the world to find examples of community gathering places.

Community meetinghouses, like this one in Mali, are places where elders meet and where there is a very special relationship between people.

Because the roof is low, everyone can sit at the same line of sight.

It's very egalitarian.

This means that you cannot stand up and take over the meeting.

You will actually hit your head.

(Laughter) In the meetinghouse there is always a space in the center where you can sit in a circle and watch each other.

So we designed just such a space in the middle of the ARCUS Center and installed the fireplace and kitchen there.

Building codes make it quite difficult to have a kitchen and a fireplace in a building like this, but they were so important to the concept that we managed to get them done.

And now the central space serves as a place for large social gatherings and first one-on-one meetings.

It's like this three-way intersection where you bump into people and start conversations.

Now you can always walk past the kitchen and see what's going on.

You can also sit by the fireplace and share stories.

Both large and small groups can learn together because the architecture sets up such opportunities.

Building relationships is also important in construction.

It is built with cordwood masonry, using logs as well as bricks.

This is very low tech and easy and anyone can do it. And that's what matters.

The act of making things is a social activity.

And it's good for the planet too. Trees absorb carbon and release oxygen as they grow. And now the carbon is trapped inside the walls and not released into the atmosphere.

So building a wall is the same as taking a car off the road.

We chose this construction method because it connects people with the environment.

But is it working?

Is it about building relationships and nurturing them?

How can we know?

Well, more and more people are coming here. For example, more people are applying for Arcus Fellowships as a result of fireplace chats and busy programming schedules.

In fact, since the building opened, applications for Arrcus Fellowships have increased tenfold.

It's working. It's about bringing people together.

So I've shown how architecture can bring people together on such a horizontal campus scale.

But we wondered if social relationships could be scaled up in skyscrapers, or rather upwards.

Skyscrapers are not necessarily suitable for social buildings.

They may seem detached and introverted.

Maybe you only see people in that awkward elevator.

But in some major cities, I have designed skyscrapers based on building relationships between people.

It's aqua.

This is a high-rise residential building in Chicago that targets young urban professionals and vacant house dwellers, many of whom are new to the city.

With over 700 apartments, we wanted to see if architecture could be used to help people get to know their neighbors, even when the home is organized vertically.

So we invented a way to use balconies as new social connectors.

The shape of the floor slabs is slightly different and changes as you go up the tower.

As a result, people can actually be seen from the balcony.

The balcony is registered incorrectly.

You can lean out on the balcony and say "Hi!"

Just like being across the backyard.

Digital simulations were used to study the wind to make the balcony more comfortable for longer periods of time throughout the year. So the effect of the shape of the balcony is to break up the wind and confuse the wind, making the balcony more comfortable and less windy.

You can connect with the outdoors even if you are far from the ground by simply stepping out onto your balcony or third-floor rooftop terrace.

In other words, the building plays a role in simultaneously creating a community within the building and within the city.

It's working.

And people are starting to meet each other on the building surfaces, and we're listening -- (laughter) they're starting to come together as couples.

But beyond romantic relationships, the building has a positive social impact on the community as evidenced by people starting groups together and starting big projects together, like this organic community garden on the building's roof terrace.

We've talked about how skyscrapers can be social connections, but what about public buildings?

How can public buildings and civic spaces create better social cohesion? Why is it important?

Public architecture does not succeed top-down.

About 15 years ago, Chicago began replacing its old police stations with similar models built throughout the city.

And despite the good intentions of treating all districts equally, the community didn't feel invested in the process and didn't feel ownership of these buildings.

It was equal in that everyone went to the same police station, but it wasn't equal in meeting the individual needs of each community.

And fairness is key here.

In my area of ​​expertise, there is debate about whether architecture can do anything to improve social relations.

But I believe we need all the tools in our architecture and toolkit to improve these relationships.

Policy reforms are recommended to restore confidence in the United States.

But my team and I thought that design and a more inclusive design process could help add something positive to this policy debate.

We asked ourselves a simple question. Can design help rebuild trust?

So we contacted the North Lawndale community and the police. In this part of Chicago, the police station is perceived as a formidable fortress surrounded by parking lots.

In North Lawndale, people are afraid of the police and are afraid to go anywhere near a police station, even to report a crime.

So we organized a brainstorming session with both groups to come up with a completely new idea for the police department.

It's called "Police Station".

"Polis" is a Greek word meaning a place with a sense of community.

It is based on the idea that if we can increase opportunities for positive social interaction between the police and local residents, we can rebuild that relationship and revitalize the neighborhood at the same time.

Instead of the police station as a formidable fortress, the public side of the police station has a very lively space, with places like barbershops, coffee shops, and sports courts to encourage conversation.

Police and children both love sports.

These insights came directly from community members and police officers themselves, and our role as designers was simply to connect the dots and suggest first steps.

So, with the help of the city and parks, we were able to raise funds to design and build a half court right next to the police station parking lot.

it's the beginning.

But is it rebuilding trust?

People at North Lawndale say the kids use the courts every day and they host tournaments like the one pictured here, sometimes with officials.

But now there are also basketballs in the station premises that children can borrow.

And recently they asked us to extend the court and build a park on the property.

And parents report amazing things.

He used to be afraid to go near the station, but now feels safer than other courts nearby and his children want to play here.

So in the future, on the public side of the station, you might be able to stop by a barbershop for a haircut, book a community room for a birthday party, renew your driver's license, or withdraw money from an ATM.

Neighborhood residents can meet each other, get acquainted with police officers, and vice versa.

This is not a utopian fantasy.

How to design to rebuild trust and trust.

As you know, every city has parks, libraries, schools and other public buildings that can be reimagined as social connecters.

But reimagining buildings for the future requires the involvement of the people who live there.

It's scary to get the public involved, and I've felt it too.

But perhaps that's because architecture school doesn't teach us much about how to involve the public in the act of design.

We are taught to protect our designs from criticism.

But I think that could change too.

Therefore, I believe that if we can focus our design thinking on creating positive and reinforcing relationships within and through architecture, we can do more than create individual buildings.

We can reduce stress and polarization in urban living environments.

we can build relationships.

We can stabilize this planet that we all share.

look?

Architects are really relationship builders.

(laughs) Thank you very much.

(applause)

So I want to thank you for giving me the opportunity to tell you about the biggest international story of your professional life. It is also the most important international challenge facing the world as far as the eye can see.

The story, of course, is the rise of China.

Never before have so many people ascended so quickly in so many different dimensions.

The problem is the impact of the rise of China. This would cause chaos in the United States and the international order for which it was its chief builder and protector.

The last 100 years were what historians now call the "American Century."

Americans are used to seeing themselves at the top of every hierarchy.

So the very idea that there is another country as big and powerful as the United States, or even stronger, feels to many Americans an attack on themselves.

To understand what we see now in this conflict, it helps to place it on the larger map of history.

Over the past 500 years, there have been 16 cases in which emerging powers threatened to overthrow the ruling powers.

Twelve of them ended in war.

So just in November, we all stop to mark the 100th anniversary of the final day of a war so comprehensive that historians had to create a whole new category: World Wars.

So, at the 11th hour of November 11th, 1918, the gunfire of World War I had stopped, but 20 million people had died.

This is a sophisticated audience, so I assume you know about the rise of China.

Therefore, I would like to focus on the impact of China's rise on the United States, the international order, and the prospects for war and peace.

But as a long-time Harvard teacher, I've learned that it's helpful to take a short break every now and then to see if everyone is on the same page.

The way I do this is by giving students a pop quiz (without grading of course), called Time Out.

So let's try this. Time out, pop quiz.

Q: Forty years ago in 1978, China started to enter the market.

At that point, what percentage of China's 1 billion people were struggling to survive on less than $2 a day?

Guess what -- 25 percent?

50？

seventy-five?

90。

What do you think?

90。

9 out of 10 spend less than $2 a day.

218 years after 40 years.

what about the numbers?

what's your bet?

please look.

Today it is less than 1 in 100.

And the Chinese president has promised that the remaining tens of millions of dollars will be raised beyond that threshold within the next three years.

So it's actually a miracle that happens in our lifetime.

Hard to believe.

But it's even harder to ignore the cruel facts.

A country that didn't even appear on the international league standings 25 years ago has grown rapidly to rival and in some cases surpass the United States.

Thus, the challenges that will shape our world are that the seemingly unstoppable rise of China is accelerating toward a seemingly steadfast ruler, the United States, en route to what could become the greatest conflict in history.

To solve this challenge, I introduce great thinkers, present big ideas, and ask the most important questions.

A great thinker is Thucydides.

His name is a mouthful and I think some people find it difficult to pronounce.

So together, one, two, three, let's do it: Thucydides.

Once again: Thucydides.

So who was Thucydides?

He was the father and founder of history.

He wrote the first ever history book.

It is titled 'History of the Peloponnesian War' and is about the Greek Wars 2500 years ago.

So just try tweeting to your friends today, "I met a great thinker."

And I can even pronounce his name Thucydides. ”

So, of this war that destroyed classical Greece, Thucydides famously wrote: "It was the rise of Athens and the fear it instilled in Sparta that made the war inevitable."

So the rise of one and the reaction of the other creates a toxic cocktail of pride, hubris and paranoia that drives both to war.

So I came up with a big idea: the Thucydides Trap.

"Thucydides' Trap" is a term I coined years ago to clarify Thucydides' insight.

The Thucydides Trap is the dangerous dynamic that occurs when a rising power, such as Athens, or Germany a century ago, or China today, threatens to dislodge a ruling power, with consequences for Sparta, England a hundred years ago, or the United States today.

As Henry Kissinger put it, once you have this idea, this concept of the Thucydides Trap in your head, it will give you a lens that will help you understand what is really going on through the news and noise of the day.

So to the most important question about our world today, "Are we going to follow in the footsteps of history?"

Or can we combine imagination, common sense, and courage to find a way to deal with this conflict without the war that no one wants and that everyone knows is devastating?

Please allow 5 minutes to unpack this. That way, later this afternoon, when you see the next news story that China is doing this, or that the US is reacting that way, you'll have a better idea of ​​what's going on, and maybe even explain it to your friends.

As we have seen with this inversion of the poverty pyramid, China has actually skyrocketed.

It's a meteor.

I think former Czech President Vaclav Havel put it best.

"Everything happened so quickly that there's no time to be surprised," he said.

(Laughter) Sometimes I look out of my office window in Cambridge at this bridge across the Charles River between Kennedy and Harvard Business Schools to remind myself how amazed I am.

In 2012, the state of Massachusetts announced plans to refurbish the bridge, which would take two years.

In 2014 it was said that it was not over yet.

In 2015, it was said that it would take another year.

In 2016, I was told that it wasn't finished yet and that they wouldn't say when it would be finished.

Finally, last year, it was completed with more than three times the budget.

Now compare this to a similar bridge I drove over in Beijing last month.

It is called Sangen Bridge.

In 2015, the Chinese decided they wanted to renovate the bridge.

There are actually twice as many lanes.

How long did it take them to complete the project?

What are you betting on at 21:00?

Guess what -- OK, 3 -- see.

(Laughter) The answer is 43 hours.

(audience: wow!) (laughter) Graham Allison: Of course that doesn't happen in New York.

(Laughter) Behind this speed of execution are purposeful leaders and functioning governments.

The most ambitious and most effective leader on the international stage today is Chinese President Xi Jinping.

And he's made no secret of what he wants.

As he said six years ago when he became president, his goal is to make China great again – (laughter) he hoisted this flag long before Donald Trump picked up his version of this.

To that end, Xi Jinping has announced specific targets for specific periods of time: 2025, 2035 and 2049.

By 2025, that means China will become the dominant powerhouse in major markets in 10 key technologies, including driverless cars, robotics, artificial intelligence and quantum computing.

By 2035, China will become an innovation leader in all advanced technologies.

And by 2049, the 100th anniversary of the founding of the People's Republic, China will be clearly number one, including an army that Mr. Xi Jinping calls "fight and win."

So these are ambitious goals, but as you can see China is already well on its way towards these goals.

And we must not forget how rapidly our world is changing.

Thirty years ago, the World Wide Web had not yet been invented.

Who will feel the effects of this rise of China most directly?

Of course, it is currently number one.

As China grows bigger, stronger, richer, and more technologically advanced, it will inevitably come into conflict with the position and prerogatives of the United States.

Well, for red-blooded Americans, especially red-necked Americans like me. I am from North Carolina. Something is wrong with this photo.

US means number one and that's us.

But, once again, it's hard to ignore a cruel fact.

Four years ago, Senator John McCain asked me to testify on this matter before the Senate Armed Services Committee.

And I created a table for them to measure the size of their respective economies, comparing the United States and China to children on opposite ends of a seesaw in a playground.

In 2004, China was just half the area.

By 2014, its GDP was on par with our country.

And in its current orbit, it will be half as big again by 2024.

The effects of this tectonic movement will be felt everywhere.

For example, in the current trade conflict, China is already the largest trading partner among major Asian countries.

So back to the Greek historians.

Harvard University's Thucydides Trap Case File has examined the past 500 years of history and found 16 cases in which emerging powers threatened to oust the ruling powers.

Twelve of them ended in war.

And the tragedy of this work is that there were very few works in which one of the main characters wanted war. Few of these wars were initiated by the emerging or ruling powers.

So how does this work?

What happens is that the provocation of a third party forces one of them to react, which sets off a spiral that pulls them into places they don't want to go.

If that sounds crazy, it is.

But that's life.

Remember World War I.

The provocation of the event was the assassination of Archduke Franz Ferdinand, a second-class figure, which caused the Austro-Hungarian Emperor to issue an ultimatum to Serbia, which involved various allies, and within two months all of Europe was at war.

So imagine if Thucydides were looking at the Earth today.

what would he say?

Can he find a better leader for the ruling power than Donald J. Trump?

(laughter) Or is he a better person to lead the rising power than Xi Jinping?

And he will certainly say, scratching his head, that he cannot think of a more versatile provocateur than North Korean leader Kim Jong-un.

Each of them seems to be determined to play the role given to them, and they play according to the script.

So, finally, we conclude again with the most crucial question, the question that will have the most grave consequences for the rest of our lives. Are the Americans and the Chinese going to use the forces of history to drive us into a war that will be devastating for both countries?

Or will we be able to summon our imagination and courage and find a way to survive together, to share leadership in the 21st century, or, as Mr. Xi Jinping put it, to forge new forms of great power relations?

That's the question I've pursued intensely for the past two years.

I have had the opportunity to speak and hear from all relevant government leaders in Beijing, Washington, Seoul, Tokyo and beyond, as well as thought leaders across both the arts and business sectors.

I wish I could have reported more.

The good news is that leaders are increasingly aware of this Thucydidian dynamic and the dangers it poses.

The bad news is that no one has a viable plan to escape history as usual.

Therefore, it is clear that ideas outside the traditional framework of national strategies are needed. In fact, it's from another page or another space. That's what brought me to TED today, and what brought me the request.

This audience includes many of the most creative minds on earth who wake up in the morning thinking not only how to manage the world we have, but how to create the world it should be.

So, as this is understood, and as you ponder it, I hope that some of you will come up with bold, indeed outlandish ideas that will change the field.

Mind you, this isn't the first time I've done that.

Let me remind you what happened immediately after World War II.

A notable group of Americans, Europeans, and other government officials, as well as from the cultural and business worlds, engaged in a growing collective imagination.

And what they envisioned and created was a new international order that would allow you and I to live in greater prosperity than ever before on earth, without wars between great powers.

So it's an amazing story.

Interestingly, all the pillars of this project that produced these results were rejected by foreign policy establishers as naive or unrealistic when first proposed.

My favorite is the Marshall Plan.

After World War II, Americans felt exhausted.

They had demobilized 10 million troops and focused on pressing domestic issues.

But when people began to realize how devastated Europe was and how aggressive Soviet communism was, the Americans eventually decided to tax 1.5 percent of GDP annually for four years and send the money back to Europe to help rebuild those countries, including Germany and Italy, where the military was killing Americans.

wonderful.

It also created the United Nations.

wonderful.

Universal Declaration of Human Rights.

World Bank.

NATO。

All these elements of order for peace and prosperity.

So all we have to do is start over.

And now, I think we need a surge of imagination and creativity grounded in history. Because, as the philosopher Santayana reminded us, in the end only those who refuse to study history are condemned to repeating history.

thank you.

(applause)

How many of you are creatives, designers, engineers, entrepreneurs, artists, or just people with really rich imaginations?

Raise your hand? (Cheers) That's most of you.

We creators have news.

The next 20 years will change the way we work more than the last 2,000.

In fact, I believe we are at the dawn of a new era in human history.

Today, the way we work has historically defined four major eras.

The hunter-gatherer era lasted for millions of years.

And the agricultural age lasted for thousands of years.

The industrial age lasted for centuries.

And now, the information age has lasted only a few decades.

And today, as a species, we are on the cusp of the next great era.

Welcome to the expansion age.

In this new era, our natural abilities will be augmented by computational systems that help us think, robotic systems that help us make things, and digital nervous systems that connect us to a world far beyond our natural senses.

Let's start with cognitive enhancement.

How many enhanced cyborgs are there?

(Laughter.) In fact, I'd argue that we've already expanded.

Imagine you are at a party and someone asks you a question you don't know the answer to.

If you have one of these, you will know the answer in seconds.

But this is just the primitive beginning.

Even Siri is just a passive tool.

In fact, for the past 3.5 million years, the tools we've used have been completely passive.

They do exactly what we said and nothing more.

Our first tool only cut where it hit.

The chisel only carves where the artist points.

And even our most advanced tools do nothing without our explicit instructions.

In fact, in the past, and this is what irritates me, we've always been limited by the need to manually force our will into tools. For example, manually, literally with your hands, even on a computer.

But I'm more like Scotty from Star Trek.

(Laughter) I want to talk to the computer.

If you want to say, "Computer, let's design a car," the computer will show you the car.

And I said, "No, it looks faster and my German is modest," and the computer showed me the options.

(Laughter) That conversation may be a little further out, maybe farther than many of us realize, but we're working on it now.

Tools are leaping from passive to generative.

Generative design tools use computers and algorithms to synthesize geometry and come up with new designs all by themselves.

All you need is goals and constraints.

Let's take an example.

For this aerial drone chassis, all I have to say is that it has four propellers, is as light as possible, and is aerodynamically efficient.

Then what the computer does is explore the entire solution space: all possibilities (millions of possibilities) that solve and meet the criteria.

You need a big computer to do this.

But it comes back to us with designs we could never have imagined ourselves.

And the computer will come up with all this stuff on its own. No one drew anything and started completely from scratch.

By the way, it is no coincidence that the body of the drone resembles the pelvis of a flying squirrel.

(Laughter) That's because algorithms are designed to work like evolution.

What's interesting is that this technology is starting to be used in the real world.

We have been working with Airbus for several years to develop this concept aircraft for the future.

It's still a long way off.

But just recently we came up with this using generative design AI.

This is a computer designed 3D printed cabin partition.

It's stronger than the original, weighs half as much, and is scheduled to fly on an Airbus A320 later this year.

So computers are now able to generate. They can come up with unique solutions to well-defined problems.

But they are not intuitive.

They still have to start from scratch every time because they never learn.

Unlike Maggie.

(Laughter) Maggie is actually smarter than our most advanced design tools.

What does that mean?

When the owner picks up the leash, Maggie knows with great certainty that it's time to go for a walk.

And how did she learn?

Well, the owner went for a walk every time he picked up the leash.

Maggie did three things. It's about paying attention, remembering what happened, and holding and creating patterns in your mind.

Interestingly, this is exactly what computer scientists have been trying to get AI to do for the past 60 years or so.

In 1952 they built this computer that could play tic-tac-toe.

Big deal.

45 years later, in 1997, Deep Blue defeated Kasparov at chess.

In 2011, Watson beat these two men at Jeopardy. Jeopardy is a much more difficult game for computers than chess.

In fact, Watson had to use reasoning to win over his human adversary, rather than working off a predefined recipe.

And a few weeks ago, DeepMind's AlphaGo beat the world's best at Go, the hardest game we have.

In fact, there are more possible moves in Go than there are atoms in the universe.

So what AlphaGo had to do to win was to cultivate intuition.

And indeed, at some point, AlphaGo's programmers didn't understand why AlphaGo was behaving the way it did.

And things are going really fast.

I mean, think about it. In the span of a human's lifetime, the computer has gone from being a child's game to being recognized as the pinnacle of strategic thinking.

Basically what's happening is that the computer is going from being like Spock to being more like Kirk.

(laughs) Right? From pure logic to intuition.

Would you like to cross this bridge?

Most people would say, "Oh no!"

(Laughter.) And you came to that decision in the blink of an eye.

Somehow you knew that bridge was not safe.

And that's exactly the kind of intuition that our deep learning systems are starting to develop now.

Pretty soon you will be able to literally show the computer what you have made or designed, and the computer will look at it and say, "Sorry, that didn't work. Please try again."

Alternatively, you can ask if people will like your next song or your next flavor of ice cream.

Or, more importantly, computers may be used to solve problems that have never been faced before.

For example, climate change.

We are not doing a very good job by ourselves. You can also ask for any help you can get.

that's what i'm talking about. Technology amplifies our cognitive abilities, allowing us to imagine and design things beyond the reach of unenhanced, old-fashioned humans.

So what about creating all this crazy new stuff we're inventing and trying to design?

I believe that the age of human augmentation will involve not only the virtual intellectual realm, but also the physical world.

How will technology empower us?

A robotic system in the physical world.

Certainly there are concerns that robots will take jobs away from humans, and that is true in certain areas.

But I'm more interested in this idea of ​​humans and robots working together to enhance each other and start populating new spaces.

This is our Applied Research Lab in San Francisco and one of our areas of focus is advanced robotics, specifically human-robot collaboration.

And this is one of our robots, Bishop.

As an experiment, we set up this tool to help construction workers perform repetitive tasks such as drilling holes in drywall for electrical outlets and light switches.

(Laughter) So, like talking to a dog, Bishop's human partner can tell him what to do in plain English and simple gestures, and Bishop will execute those instructions with perfect precision.

We use humans for perception, perception, and decision-making that humans are good at.

And we are using this robot with its advantages of precision and repeatability.

Here's another great project Bishop has worked on.

The goal of this project, which we called HIVE, was to prototype an experience where humans, computers, and robots all work together to solve highly complex design problems.

Humans worked as labourers.

They patrol around the construction site and manipulate the bamboo. Incidentally, since bamboo is a non-isomorphic material, it is very difficult for robots to handle.

But then this fiber winding was done by robots, which is almost impossible for humans.

Then came the AI ​​that controlled everything.

It was telling humans what to do, telling robots what to do, and tracking thousands of individual components.

Interestingly, the construction of this pavilion would not have been possible without humans, robots, and AI reinforcing each other.

OK, share another project. This is a little crazy.

We collaborated with Amsterdam-based artist Joris Laarman and his team at MX3D to generatively design and robotically print the world's first autonomously manufactured bridge.

So Joris and AI are now designing this in Amsterdam.

And once they're done, press 'Go' and the robot will start 3D printing onto the stainless steel and continue printing without human intervention until the bridge is complete.

That is, as computers enhance our ability to imagine and design new things, robotic systems will help us build and manufacture things we could never make before.

But what about our ability to sense and control these things?

What happens to the nervous system of the things we make?

Our nervous system, the human nervous system, tells us everything that is happening around us.

But the nervous system of what we make is rudimentary at best.

For example, you wouldn't tell the city's public works department that your car just hit a hole on the corner of Broadway and Morrison.

Buildings don't tell designers whether people inside like to be there, and toy makers don't know where and how their toys actually play and whether it's fun.

Designers must have envisioned this lifestyle for Barbie dolls when they designed them.

(Laughter) But what if it turns out that Barbie was actually very lonely?

(Laughter) If designers knew what was really going on in their designs—roads, buildings, Barbie—in the real world, they could have used that knowledge to create a better experience for their users.

What is missing is the nervous system that connects us to everything we design, manufacture, and use.

What would you do if that information flowed in from something you made in the real world?

Everything we make spends a ton of money and energy trying to get people to buy what we make, in fact, about $2 trillion last year.

But if we have a connection with what we design and create after it's out in the real world, after sale, after launch, and so on, we can really change that and change it from making people want what we have to making what people want in the first place.

The good news is that we are working on a digital nervous system that connects us with the things we design.

We're working on a project with a few guys and their team in Los Angeles called the Bandito Brothers.

And one of the things they do is build cars that do absolutely insane things.

These guys are crazy -- (laughter) in the best possible way.

And what we're working on with them is giving a traditional race car chassis a nervous system.

So we put dozens of sensors on this car, had a world class driver drive it, took it out into the desert, and drove it through for a week.

And the car's nervous system captured everything that was happening to the car.

We got 4 billion data points. All the power it received.

And we did something crazy.

We took all that data and put it into a generative design AI we call "Dreamcatcher."

So what do you get when you give a design tool a nervous system and ask it to build the ultimate car chassis?

You can see this.

This is something that humans could never have designed.

Humans designed this, but humans were augmented with generative design AI, digital nervous systems, and robots that could actually build something like this.

So if this is the future, the Augmented Age, and we are cognitively, physically, and perceptually augmented, what would it look like?

What will become of this wonderland?

I believe that the world will move from man-made to farmed products.

We are moving from being built to growing.

We move from isolation to connection.

And we plan to move away from extraction and adopt aggregation.

Also, I think we will change from demanding obedience to our own things to valuing autonomy.

Our world will change dramatically thanks to our enhanced capabilities.

We will have a more diverse, more connected, more dynamic, more complex, more adaptable, and of course, more beautiful world.

The shape of things to come will be unlike anything you've seen before.

why?

Because it is the new partnerships between technology, nature and humanity that will shape these things.

For me, it's a future worth looking forward to.

Thank you very much to all of you.

(applause)

Every summer my family and I travel around the world to India, a culturally diverse country 3,000 miles away.

Well, India is a country notorious for its scorching heat and humidity.

For me, the only way to beat this heat is to drink lots of water.

Now, while in India, my parents always remind me to drink only boiled or bottled water. Unlike here in the United States, where clean drinking water is readily available at the turn of a faucet, water in India is often polluted.

Therefore, parents must ensure that the water we drink is safe.

But we quickly realized that not everyone is lucky enough to enjoy our clean water.

Outside my grandparents' house in downtown India, I saw people lining up in a long line under the scorching sun to fill buckets with water from taps.

I've seen children my age fill these clear plastic bottles with roadside stream sewage.

Watching children forced to drink water that they felt was too dirty to touch changed my view of the world.

This unacceptable social injustice has made me want to find a solution to the world's clean water problem.

I wanted to know why these children are deficient in water, an essential substance for life.

And we learned that we are facing a global water crisis.

This may seem surprising as 75 percent of the earth is covered in water, but only 2.5 percent of it is freshwater, and less than 1 percent of the earth's freshwater supply can be consumed by humans.

Population growth, industrial development, and economic growth have increased the demand for clean water, but freshwater resources are rapidly depleting.

According to the World Health Organization, 660 million people worldwide do not have access to clean water sources.

Lack of access to clean water is the leading cause of death for children under the age of five in developing countries, with UNICEF estimating that 3,000 children die from water-related diseases every day.

So, after returning home one summer in my eighth grade, I decided I wanted to combine my passion for solving the global water crisis with my interest in science.

So I decided it would be best to convert my home garage into a lab.

(Laughs) Actually, at first I remodeled the kitchen of my house into a laboratory, but my parents didn't really approve of it, so I was kicked out.

I also read a lot of journal articles on water-related research and learned that developing countries are currently using something called Solar Disinfection (SODIS) to purify water.

SODIS puts contaminated water in a transparent PET bottle and exposes it to sunlight for 6-8 hours.

Ultraviolet light from the sun destroys the DNA of these harmful pathogens and does not pollute the water.

SODIS is very easy to use and energy efficient as it only uses solar energy, but it takes up to 2 days in cloudy weather so it is very time consuming.

So, this new method called photocatalysis has recently been used to speed up the SODIS process.

So what exactly is this photocatalyst?

Let's break it down. "Photo" means from the sun, and a catalyst is something that speeds up a reaction.

So all the photocatalyst is doing is speeding up this solar disinfection process.

When sunlight comes in and hits a photocatalyst such as TiO2 or titanium dioxide, it produces highly reactive oxygen species such as superoxide, hydrogen peroxide, and hydroxyl radicals.

These reactive oxygen species can remove bacteria, organics and many other contaminants from drinking water.

Unfortunately, however, the methods currently implemented for photocatalytic SODIS have several drawbacks.

What they are doing is taking a clear plastic bottle and coating the inside with this photocatalytic coating.

However, photocatalysts like titanium dioxide are actually commonly used in sunscreens to block UV rays.

So coating the inside of these bottles actually blocks some of the UV light, making the process less efficient.

Also, these photocatalytic coatings are not tightly bonded to the plastic bottles, so they wash off and you end up drinking the catalyst.

TiO2 is safe and inert, but if you keep drinking the catalyst, it's very inefficient because you have to keep refilling the catalyst even after a few uses.

My goal was therefore to overcome the shortcomings of these current treatment methods and create a safe, sustainable, cost-effective and environmentally friendly method of purifying water.

What started as an eighth grade science fair project is now a photocatalytic composite for water purification.

Composites are a combination of titanium dioxide and cement.

Cementitious composites can be molded into several different shapes, allowing for a great variety of deployment methods.

For example, you can create a rod for your personal use that easily fits inside your water bottle, or a porous filter that can filter water for your family.

It can also be used to coat the inside of existing aquariums to purify large volumes of water over time for the community.

Well, my journey so far has not been an easy one.

As you know, I didn't have access to a sophisticated lab.

I was 14 years old when I started, but age has never let me lose my interest in pursuing scientific research and solving the global water crisis.

You see, water is more than just a universal solvent.

Water is a universal human right.

So I've been working on this science fair project since 2012 to bring it out of the lab and into the real world.

And this summer, I founded Catalyst for World Water, a social enterprise that aims to promote solutions to the global water crisis.

(Applause) A single drop of water doesn't do much, but when many drops gather, they can sustain life on Earth.

Just like water droplets come together to form an ocean, I believe we all have to come together when tackling this global problem.

thank you.

(Applause.) Thank you.

(applause)

My inbox is full of hate emails and personal harassment for years.

In 2010, I started replying to those emails and suggesting the writers have a chat over coffee.

We have met hundreds of times.

They taught me something important and I would like to share it with you.

I was born in Turkey to Kurdish parents and moved to Denmark at an early age.

In 2007, I was one of the first women from a minority background to run for the Danish parliament.

I won, but quickly learned that not everyone was happy with it, as I had to quickly get used to finding hateful messages in my inbox.

Those emails start with something like this: "What is a bastard like you doing in Parliament?"

I never answered.

Just delete the email.

I thought the sender and I had nothing in common.

They didn't understand me, and I didn't understand them either.

One day, one of my parliamentary colleagues told me that hate mail should be saved.

"If something happens to you, it gives the police a lead."

(Laughter) I realized she said "when something happens" instead of "if".

(Laughter) From time to time, hateful letters were sent to my home address.

The more I participated in public discussions, the more harassing emails and threats I received.

After a while, I got a secret address, so I had to take extra precautions to protect my family.

And in 2010 the Nazis started harassing me.

It was the man who attacked a Muslim woman on the street.

As time went on, things got even worse.

I was at the zoo with my kids and the phone kept ringing.

It was the Nazis.

I got the impression that he was close.

we went home

When he came back, he asked, "Mom, I don't even know you, why do you hate me so much?"

"Some people are just stupid," I said.

At the time, I actually thought that was a pretty smart answer.

And I suspect that's the answer most of us would give.

Others are stupid, brainwashed and ignorant.

We are the good guys and they are the bad guys.

A few weeks later, I was at a friend's house, very upset and angry at all the hate and racism I had been exposed to.

It was he who called me and suggested that I visit him.

"They will kill me," I said.

"They will never attack a Danish MP," he said.

"Anyway, if they kill you, you'll be a martyr."

(Laughter) "So it's a total win-win situation for you."

(Laughter) His advice was so unexpected that I went home, turned on my computer, and opened the folder where I kept all the hate mail.

There were literally hundreds of them.

Emails that start with words like "terrorist," "raghead," "mouse," or "whore."

I decided to contact the person who sent the most.

His name was Ingolf.

At least I decided to contact him once so I could say I tried.

To my surprise and shock, he answered the phone.

I blurted out, "Hi, my name is Ozlem. You've been sending me a lot of harassing emails.

You don't know me, I don't know you

I was wondering if we could come back and have coffee together and talk about it?"

(laughter) There was silence on the line.

And he said, "I have to ask my wife."

(laughs) What?

Do racists have wives?

(Laughter) A few days later we met at his house.

I will never forget when he opened the front door and held out his hand to shake my hand.

I was very disappointed.

(Laughter) Because he was nothing like what I imagined.

I was expecting a terrible person - a dirty and messy house.

It wasn't.

His house smelled of coffee from the same coffee set my parents used.

I ended up staying there for two and a half hours.

And we had a lot in common.

Even our prejudices were similar.

(Laughter) Ingolf said that when the bus stopped 10 meters away from him while he was waiting for the bus, it was because the driver was "ragheaded."

I recognized that feeling.

When I was younger, I was convinced the driver was racist when I was waiting for the bus and it stopped about 10 meters away.

When I got home, I was very vague about my experience.

On the one hand, I loved Ingolf.

He was friendly and easy to talk to, but on the other hand, I couldn't stand the idea that I had so much in common with someone with such an overtly racist view.

Gradually, and painfully, I realized that the people who sent me hateful emails were just as critical of me as they were of me.

This was the beginning of what I call #dialoguecoffee.

Basically, having coffee with the people who said the worst things to me, I try to understand why they hate people like me when they don't even know me.

I have been doing this for the past 8 years.

The majority of people I approach agree to meet with me.

Most of them are men, but I've also met women.

I always make it a point to meet at their homes to show them that I trust them from the beginning.

I always bring food. Because eating together makes it easier to find common ground and get along.

Along the way, I learned some valuable lessons.

Those who have sent hate mail are workers like you and me, husbands, wives and parents.

I'm not saying their behavior is acceptable, but I've learned to distance myself from people who express hateful opinions without distancing themselves from such opinions.

And I realized that the people I visit are afraid of strangers, just as I was afraid of them before I invited them out for coffee.

At these conferences, specific themes emerge one after another.

It shows up whether I'm talking to a humanitarian or a racist, a man or a woman, a Muslim or an atheist.

They all seem to hold others responsible for the hatred and generalization of the group.

They all believe they have to stop demonizing others.

They point to a politician, the media, a neighbor, or a bus driver that stops 10 meters away.

But when I ask, "How are you?

What can you do? ’, it usually goes like this:

I have no influence.

I have no power ”

i know that feeling.

For most of my life, I too thought I had no power or influence, even when I was a member of the Danish parliament.

But today I learned that the reality is different.

We all have power and influence where we are, so never underestimate your own potential.

The #dialoguecoffee meeting taught me that people of all political beliefs can demonize others with different views.

i know what i'm talking about

As a child, I hated various groups.

At that time, my religious views were very extreme.

But friendships with Turks, Danes, Jews, and racists have vaccinated me against my own prejudices.

I grew up in a working class family and met many people on my travels who tried to talk to me.

They changed my perspective.

They shaped me as a democratic citizen and a bridge builder.

If we want to prevent hatred and violence, we need to be as open as possible and have dialogue with as many people as possible for as long as possible.

It can only be achieved by advocating discussion, critical conversation, and non-demonstrating dialogue.

I will ask a question.

Think about it when you get home and in the next few days. But you have to be honest with yourself.

It should be easy, other people don't know it.

The question is this...

who will you demonize?

Do you think American President Trump's supporters are deplorable?

Or are those who voted for Erdogan in Turkey crazy Islamists?

Or are those who voted for Le Pen in France stupid fascists?

Or maybe you think Americans who voted for Bernie Sanders are immature hippies.

(Laughter.) All of these words have been used to denigrate those groups.

Perhaps at this point you think I'm an idealist?

I would like to give you a challenge.

Before the end of the year, consider inviting someone you demonize, someone you disagree with politically and/or culturally and who you think you have nothing in common with.

How about inviting people like this to #dialoguecoffee?

Remember Ingolf?

Basically, I suggest you find Ingolf in your life, contact him or her, and meet at #dialoguecofee.

When starting #dialoguecoffee, you need to remember this. First, don't give up if the other person refuses first.

It can take up to a year to arrange a #dialoguecoffee meeting.

2: Acknowledge the other person's courage.

You are not alone in being brave.

Those who invite you to their homes are just as brave.

3: Don't judge during a conversation.

Focus most of the conversation on commonalities.

As I said earlier, please bring your own food.

Finally, you will meet again, so remember to end the conversation in a positive way.

A bridge is not built in a day.

We live in a world where many people don't know much about others, yet have definitive and often extreme opinions about others.

Of course, we notice prejudices on the other side, not in our stronghold.

And we ban them from our lives.

I will delete harassing emails.

We associate only with people who think like us and speak of others with contempt.

We unfriend people on Facebook, and when we come across people who discriminate or dehumanize a person or group, we don't force them to talk to them to challenge their views.

A healthy democratic society thus collapses when we do not affirm individual responsibility to democracy.

We take democracy for granted.

it is not.

Conversation is the most difficult and most important thing in a democracy.

So here is my challenge.

Find your Ingolf.

(Laughter) Start a conversation.

It's true that people have dug trenches, but we all have the ability to build bridges across trenches.

And I would like to end by quoting my friend Sergio Yuzan, who lost his son Dan Yuzan in a terrorist attack on a Jewish synagogue in Copenhagen in 2015.

Sergio refused the offer of revenge and instead said...

"Evil is defeated only by kindness between people.

Kindness takes courage. ”

Dear friends, be brave.

thank you.

(applause)

As an archaeologist, I am often asked what my favorite find is.

The answer is simple, my husband Greg.

(Laughter.) We met in Egypt at the first excavation.

It was my first lesson in finding the unexpected.

This started an incredible archaeological partnership.

Years later, I proposed to him in front of my favorite 4,600-year-old pair of Prince Rahotep and Nofret in the Cairo Museum.

I thought that if I was going to ask Greg to spend the rest of my life with me, I should ask in front of the two of us who vowed to each other for eternity.

These symbols endure because when we look at them we are looking in the mirror.

They are a powerful reminder that our common humanity has not changed.

The thrill of archaeological discovery is as powerful as love. Because ancient history is the most fascinating mistress imaginable.

Many archaeologists have devoted their lives to unraveling the mysteries of the past, in dense rainforests under the hot sun and arctic winds.

Many people want it.

Some discover.

All worship in a temple where one discovery can change history.

On my first day in Egypt, I worked at a 4,200-year-old burial ground called Mendez in the delta of northeastern Egypt.

That's a picture of me - I'm just in bliss.