Science Forward-Ethics

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[background music]

Shumita Basu, Host, Science Forward: It's a moment we've all faced. There's something we really want -- maybe it's an A in a class. There are different ways to get there.

You can buy an essay or the test answers around some disreputable corner. Or you can do all the work, research additional sources, talk to people you know about what you're learning, ask questions in class and more.

Either of these ways can get you to that A, and for each way of getting to the A, there are consequences. Some are immediate and intense, some are slow and subtle, and some are positive and permanent.

When we reach these moments, we balance risk and reward, effort and ability, chances of getting caught and severity of penalties. Most of all, we consult our own inherent sense of right and wrong.

We probably make these kinds of decisions many times a day, sometimes without even noticing them. But for a scientist and her scientific work, the scales and stakes of these decisions might be much bigger, and the dilemmas more complex.

In this video, we'll be discussing those scales and stakes, and how scientists balance them in their work.

[Science Forward theme music]

Members of the scientific community face a wide variety of ethical questions.

Andrew Zwicker, Princeton Plasma Physics Laboratory: I think it's about being transparent, about honoring the scientific process, sharing your results with the community, so they can be tested, and in the end, taking your scientific knowledge to do good--as cliché as that sounds.

Elizabeth Reis, Macaulay Honors College: Medical ethicists think about a range of issues that go from smaller, everyday issues that might come up in a hospital setting, or in a doctor's office, and then those, sometimes overlap with some bigger questions like end of life.

Lissette Delgado-Cruzata, John Jay College: We always want to make sure that no harm will come to the individuals who participate. We want to let them know ahead of time that they can withdraw from the study at any given time if they choose to.

We also want them to feel comfortable. They're donating time, again, and part of themselves to this, so it is quite important they understand this.

Mary Pearl, Macaulay Honors College: A field researcher needs to come with an ethical attitude of responding to people's needs as they're perceived and to be thoughtful and respectful.

Shannon Swilley Greco, Princeton Plasma Physics Laboratory: My main focus is to make sure that everyone has equal access. That means considering women, that means considering minorities, that means considering people with disabilities.

I need to make sure that they have just as much access to the work that we do and opportunities that we provide than anybody else.

Jill Bargonetti, Hunter College and the Graduate Center: I think big ethical concerns come in with the chemicals that get used in the laboratory and how you dispose of the chemicals in our environment.

Those aren't things that are always so thought of. We tend to think of the genes as being so scary, but the chemicals can often be more scary than the genetics involved.

For me, a lot of the ethical concerns come in with, how am I protecting my students who work in the lab, or the people who work in the lab? Are people safe in this particular environment?

Sanjoy Banerjee, CUNY Energy Institute: Everything has a two-edged sword to it. We discovered that the atom can give you energy which is a million times more than a chemical reaction. How to harness that peacefully is one of the great challenges of our era actually.

Shumita Basu: All these kinds of questions require the kinds of balancing and analysis that we do in our everyday lives. Can we really trust our own common sense, or gut feelings? What makes right and wrong into ethics?

I think that a lot of people think of science in succeed-or-fail sorts of terms. They think of it as something very mechanical, something with right or wrong answers, something that you need to be objective for. Ethics can sometimes be seen as a very emotional sort of discipline.

Massimo Pigliucci, City College: It's funny because the way you put it is interesting. I would say that science is much less objective than most people think, including a lot of scientists. Ethics is a lot more objective than a lot of people seem to think.

Science of course is based on empirical evidence. But again, it is done by human beings, and human beings have preferences. They fall in love with their theories, and they're selective about the kind of data that they acquire.

You are right that from an evolutionary perspective, ethics did originate as a sense of gut feeling, but that's not what ethics is. If you think that something is right or wrong, you have to be able to articulate it. Why is it?

Just saying, "Well, I feel that way," that's not going to convince anybody. But you can articulate those thoughts in a rational manner, in a reasonable manner, and that's where you'd really be doing ethics.

Ethics really is a branch of logic. In a sense, it's actually surprisingly more of objective. Objective doesn't mean independent of the human mind. I don't mean that there are rules of morality that are written somewhere outside of the human mind, and we can just read them off somewhere.

What I mean is that given certain assumptions about what humans want, desire, then you can build a logically coherent system of rules that will get you closer to certain things and further away from other things.

If we were a completely different kind of species, or had a completely different kind of social structure then we would have to have a different ethics.

Shumita Basu: The scientific community has made ethical mistakes in the past, including the way some scientists have treated the people, places, and animals they've studied. But we can all learn from those mistakes and commit to making the best ethical choices possible with the information available.

Mary Pearl: We can't go back in time and correct these things, but I think it's really instructive to understand how the world was viewed by a certain segment of the scientific community where people with other backgrounds were dismissed. This kind of history is really something we have to face.

I think scientists are often thought of as people who are looking for the truth and earn a certain respect or admiration. But scientists are susceptible to the same currents in our society.

We are, after all, social animals, and we do conform to our group's definition of who we are and who others are. I think one of the best advances in the scientific endeavor is the fact that all kinds of people are scientists now.

I went to a national park in Madagascar and was walking with a local guide who told me of his great interest in spiders and how he had pointed out spiders to a scientist from North America, who was very excited about them, photographed and took samples and went back. He never heard from that person.

Now that person wrote scientific articles about what he discovered, including naming new species. This person who was instrumental, who taught him about the spiders in the park in Madagascar was not even cited, thanked. In my opinion, this person should have been a co-author.

I think with discovery research in the field, people who help you should be either acknowledged or brought on as co-authors.

Shumita Basu: One of the areas of science where we see the most clear connections to ethics is when we look at fields that require human participation. One of the most important principles of scientific work with humans is informed consent.

Sarah Schlesinger, The Rockefeller University: The ethical considerations of any science that involves human beings, in my view, are the first 10 things you need to be thinking about. Those

ethical considerations are broad. First, there are the ethical considerations of being a physician, and first, do no harm.

Historically, there have been many scientists over the years who have conducted human clinical trials, or human experimentation without seeking the consent or not seeking the informed consent.

Informed consent means that the person really understands what they're signing up for. Not that they signed a form, but that they really know what's going to happen to the best of anybody's ability.

Having informed consent is a relationship. It's a conversation. It's a discussion.

Elizabeth Reis: The four principles of medical ethics are, one, autonomy, two, beneficence which means just doing good for the patient, three, non-maleficence which is do no harm, and four, which is justice, or sometimes thought of as fairness.

These are great principles to work with. One of the things that's a little deceptive about the principles is that I don't want students to think you just put these four principles up on the board. You have your case, and you can check off, this one's about autonomy, or this one's about beneficence. Here it all lines up and it's perfect. Here's your answer.

I like to think about how they overlap. Sometimes thinking about one pulls you away from thinking about another. Then you focus on another and you see, oh wait, maybe this is the more important one here.

Shumita Basu: Scientists' ethical obligations don't end with designing or conducting experiments. Their work often affects the world in ways they might not have even originally considered. It sounds like a lot of the ethical dilemmas come out of human interference.

Is that really a good way to be thinking about it, as a scientist moving around in the world, that you are an object of interference with everything around you?

Mary Pearl: Humans are a part of the ecosystem. I think that, yes, people, by our overabundance are creating problems. It then creates the ethical obligation to mitigate our impact.

We can't go through life without making mistakes, but we can become more aware of the negative impacts that we make that we can avoid.

Massimo Pigliucci: You get funding mostly from public institutions, especially in the United States. So the public is very much interested and ought to be interested in what you're doing and why you're doing it, and you should be able to justify it to the public at large.

That’s part of the ethics of science. There is a certain level of communication with the public, a certain level of trying to talk to people and explain why it is that certain kinds of resources that could be used reasonably for something else are going into it.

Andrew Zwicker: Right now, there is just this loud, loud noise of false information. Narratives are coming on the Internet and on television at people left and right. It means the responsibility of science journalists, and I would argue of scientists, is to come out of the laboratory and counteract this narrative.

It is not just an attack on science. It is, and I don't think this is too grandiose of a statement, it's an attack on our democracy itself.

Shumita Basu: We've heard about scientists' ethical obligations to the scientific community, to the participants in their experiments, and their obligations to the public. But what about their ethical obligations to themselves?

Massimo Pigliucci: This is where something called virtue ethics comes in. It's about you. It's about how are you going to be improving as a person. What are you going to do about your own faults and shortcomings?

So you ask yourself, what kind of character should the scientist develop? As somebody who's interested in inquiring into the nature of things, what kind of virtues should a scientist strive for? What kind of vices should a scientist try to stay away from?

Everybody can understand that cheating is a vice and being honest is a virtue. It's not difficult to understand, but it's very difficult to practice.

Literally every day, you will find yourself in situations in the laboratory, or when you're writing a paper, or when you're writing a grant proposal. You will find yourself in situations that you may be tempted to engage in a vice, and you'll take a shortcut, not treat a colleague fairly, or a graduate student fairly.

Seneca was one of the virtue ethical writers of antiquity. He was a Roman senator. He famously said that the goal is not to become perfect, it's just to become better than yesterday. But if you become better than yesterday every day, it accumulates.

[Science Forward theme music]

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