Professor Anne Fausto-Sterling Talk

0:18:

LS:

Thank you and welcome to the Gender Institute at Royal Holloway's third launch event. The Gender Institute was founded in 2020 and it is starting a series of research talks, pedagogical workshops and work on institutional culture interested in integrated gender into the Royal Holloway community and its impact on its surrounding community. We're lucky to have as our third launch speaker, Professor Anne Fausto-Sterling. Professor Fausto-Sterling received a BA in Zoology from the University of Wisconsin and a PhD in Developmental Genetics from Brown University. She's a Fellow of the American Association for the Advancement of Science. She's known in the academic world as a developmental biologist while researching in the fields of gender, sexual identity, gender identity and gender roles. She's written two books that you may have come across written for the general public, *Myths of Gender: Biological Theories About Women and Men* and *Sexing the Body: Gender, Politics and the Construction of Sexuality* which came out in 2000 but a recent updated edition has significantly new information in it. She has published over 60 scholarly articles. She stated that *Myths of Gender* was aimed at using her skills as a biologist to look at scientific claims about what women can and can't do. Her criticisms of the neutrality and objectivity of science are clear as she explains that culture has been woven around assumptions of women based on gender roles and the neglect of the consideration of gender throughout history and places emphasis on the belief that role division between men and women is largely predetermined by human evolutionary history and this belief has informed her essay, 'The Five Essays: Why Male and Female is Not Enough', which presents the idea of multiple sexes outside the gender binary of male and female. She's got awesome underground extensive research into gender development, challenging entrenched ideas of gender within scientific beliefs. Her talk today will address 'gendersex' which I will allow her to explain to you as a concept and please join me in welcoming and being very grateful for her talk. Here, I'll turn the floor over to you now, Anne.

2:39:
Professor Anne Fausto-Sterling (AFS):

The title is 'Making Gender/Sex' and showing here the ideas of it goes from interdependence to independence and the interdependence in this case, as shown here with two caregivers, helping a child who cannot yet help him/herself to children who are independent in that they can move around and walk and make some of their own decisions. To children who express a very clear identity.

3:17:
These children in this image are both twins. These two are twins and these two are twins and you can tell from the way they're dressed and mostly from the weather, dressed and their hair style that they have an identity, which I'd venture to say is an identity that they are participating in creating at this age that they are depicted. So, the question is: how do they move from that independent/interdependent stage as in infancy to a stage at about age three where they have the ability to insist on their own identity?

4:05:
The theses that I'm going to offer are three-fold. First, that gendersex identity is embodied, it's not something that exists in the aether or in some unattached mind, but I believe in mind-body unity. The second is that identity is a life-long dynamic process, not a trait or thing. And it's often treated as a thing that you have and once you have it, there you are. Instead, I argue that it's something that's maintained dynamically as a process in our bodies from birth till death. And then thirdly, the embodiment of gendersex begins at birth or earlier. And this is what I want to talk about. You can ask me about the earlier but for the purposes of today's discussion I want to talk about a period from birth to about three years of age.

5:13:
So, first, let me address, as Laura suggested: what is gendersex? What do I mean by this term? Traditionally, and I think most people in this audience are used to the theory by which sex is seen as the equivalent of biology or nature and gender is seen as culture and you can have either sex, or you can understand sex or gender, either one to be determinative, that is, you can believe that sex or the nature or biology determines behaviour and identity. Or you can believe that gender or culture determines behaviour or identity. But in either case, you see that these, you don't understand these, you see these as really separate terms with maybe a small area of overlap, and either has the potential to be a part of a deterministic theory. Gendersex, however, I understand as a developmental process by which sex and gender constantly affect one another to produce an intermediate term which I'm calling 'gendersex' and in which this diagram is most of whom we are. That is there is a very teeny part of the universe which maybe one can argue is pure sex and another teeny part that maybe one can argue is pure gender. But and someone well may press me on that in the discussion in which case I can guarantee you I will waffle because I basically think gendersex pretty much is what we all are all of the time. But let me give you some examples. And this is an example that really is most relevant to American baseball and my apologies for the cultural narrowness of this but we grow up, we here in America to be told that we throw like a girl or we throw like a boy and there have been all sorts of theories about this, suggesting how throwing, how boys have a whole different kind of articulation in their shoulder, maybe they're anatomically slightly different but that they throw overhand – whereas girls – and put their body into it differently, whereas girls seem to only be able to throw from the side. And the result of that is that boys, it's been traditionally said, have even at a young age, at age 5 they could throw a baseball at 26.6 miles per hour at age 13, at 53, whereas girls can only to a paltry 38.5.

7:58:
And then for some reason, race gets worked into this in an odd sort of colonial way. And we can go back to this also. But for some reason it's, in this particular diagram, a little inset about Aboriginal boys and girls throwing tennis balls, who is included? And I could have cut it out but I wanna point out that race gets worked into these things from time to time in kind of strange ways.

8:26:

So, we have this example. Except that if you consider a news report more recently from a transplant-planter Brit, John Oliver, and the sound is gone. So, what John Oliver is reporting on is a young pitcher aged 13 from a couple of years ago who made a huge breakthrough by throwing shutouts at the National Little League games. And she threw her top recorded pitch made which was 71 miles per hour. So, the argument that I'm making is that this throwing like a girl is very culturally dependent and that you learn how to throw like a girl, or you learn how to throw like a boy.

9:35:
The second example may be a little bit more universal in how people think about bodies, is an example of how gendersex: testosterone levels. Now, what this graph shows you is testosterone measured in men in the morning and in the afternoon because there is a general diurnal rhythm of testosterone secretion. But compare men who are not involved in infant care to men who are involved in infant care, maybe zero to one hours a day, to ones who are involved one to three hours a day. And if you look you can see that men who are not involved in infant care have a much higher testosterone level than in men who are involved in even an hour of infant care. So, to say that testosterone levels are just a thing that you can call 'sex' doesn't seem right because in fact, testosterone levels depend on the context in which the human who has the testosterone levels is living. And certainly, the degree of childcare a father participates in is an aspect of culture and gender as well as maybe particular family circumstances. But the body, his body, responds to testosterone production in response to whether or not it's interacting with an infant. So, this again, is an example of gendersex.

11:06:
So, let's ask next, what is gendersex identity? We can ask this. Go back and look at some historical definitions. The first definition I'm gonna offer you comes from John Money who was writing in the 1950s and the 1960s. And in this point of view, subjective identity, public role and expression are inseparable. So, he wrote that 'the private experience of gender role is one side of the coin. The public expression of gender identity is the other. And that gendersex is an identity. These are each side of a single coin.' So, there's not a gender role that can be understood privately and subjectively separate from a public expression.

12:02:
And a second point of view is presented a little bit more modernly in a textbook on gender and development by Blakemore and all comes from 2009. And they say individuals reliably answer, are you a boy or a girl? That's how they know what gendersex identity is. That is, you ask a child, 'are you a boy or a girl?' And they reliably answer one or the other. The whole question of what is meant by 'reliable' again, is something that needs to be talked about. But I've cartooned this, showing this child trying to decide whether it should go to the bathroom with the image of the boy or the bathroom with the image of the girl and presumably the individuals' subjective identity would be what informs the individual what to choose. Now, unlike Money, Blackmore separates this idea from gender roles, which they view as the cultural expectations for people of one sex or the other. And they say, they would show then that this child who might choose to go through the boy door here to the bathroom might have a gender role that looks more like what we culturally expect girls to be involved in.

13:29:
O.K. So, if we think about what this is then there are some common underlying assumptions here. And these are the assumptions that have been used to study gender, sex and gender identity in most scholarly work. And these assumptions are that binary gender identity is normative. That's the biggest one. And the implication of that is that there's only one thing that requires explanation and that's the non-binary. The other, second assumption common to this work is that identity is static and unsituated. And the third, and this is, again, depending on whether you are a proponent of sex as being a primary determinant or gender as being a primary determinant, but the third is that gender identity is determined by one or the other. Either sex, gender a little bit or sex gender a lot. But there's another way of looking at this, and this is a third definition of gendersex identity, and this is from a paper by Egan and Perry. And that's not quite in the period that I study. They look at components of gendersex identity measured in grades four through eight. And what they argue is the gendersex identity is more complex and is an ongoing interaction between children's sense of psychological compatibility with their gender category, determinants for the child of gender compatibility would be self-observation of concrete, easily observable aspects of sex typing, such as activity choices and playmate preferences. And then a third, which they add in, intergroup bias. That's the sentiment that one's own sex is superior to the other.

15:30:
So, compatible with this, I want to offer my underlying assumptions as I move forward in this discussion. The first is that gendersex identity is a non-binary, it can be understood as a continuum. This means that what we need to be studying is not the variability of the other, but the variability within a single process explains all that is, no matter what your gendersex identity is or becomes as you move from infancy to adulthood, there is variability in the human developmental process and what we need to understand is what the general process of identity formation is and how variability leads us to different places on a continuum. The second is that since people do mostly use binary or binary practices, that cultural practice imposes categories and so what we have is a cultural practice, for example, of naming infants on a birth certificate when they're born as either a boy or a girl, that's the imposition of a binary.

16:45:
And finally, that identity is a dynamic process and again, it's not a single thing. It's something that develops, it's maintained in a complex sort of dance between subjectivity and intersubjectivity and it changes with the lifecycle. I want to take a second just to say: what does variability look like? Because I get this kind of thing in the question and the, often, in the questions. And I'm gonna just give you a couple of examples of my studying individual families. I'll just maybe give you just one example. But I studied 30 different mother-child dyads in their first year of life. And so, a mother-daughter dyad, mother-son dyads, each of these lines is a different dyad. A different family. And here we've looked at how many seconds in a five-minute period the mother has assisted the infant in moving from one place to another, so-called 'assist shift'. And what you see is a mean regression line, this black line here. But you see a huge variability from one family to the next. You see an ever-greater variability in the mother-sons. So, there's 15 of these families and they

come out to this rather large average difference. But what you can see is that there's a lot more of the individual daughters who are below this regression line which starts at about 10 seconds, and very few individual sons who start down here. And I can show you this in different examples, but the point is that while you have these mean regression lines, you have a lot of individual variability within any particular grouping. And it's this individual variability that I think is probably important in understanding the process of identity formation.

19:05:
This is just one other example of what the variability looks like if we look at variability in a 3D state space. And again, this is duration. And here we look at the number of sections of affection that touch while vocalisation is happening and assisted locomotion. And again, each of these blue dots is an individual family of a mother-son. The red triangles are individual families with mother-daughters. And you see clearly an average difference, but you also see loads of individual differences. So, it's understanding how those contribute to later identity formation that I think is important. I won't worry about the 3D graph right now.

20:01:
So, I don't wanna go into this particular diagram in great detail but what I want to simply point out is that what we need to understand is the interaction between the inner subjectives, that is especially important in the first year of life and the subjective which begins to emerge after about 18 months. So, you have this constant reconstitution of what's going on in the world with what's going on with the individual. So, events with the individual entail domains of interaction in the world. These, again, feedback on the individual causing the emergence of identity and so forth. And we can go again into this diagram in great detail if you want to later, but I just want you to get this idea right now that the subjective and the inner subjective are in constant interaction.

20:56:
We do know some things about early development, and I want to show you this: the shape of early development as regards to what we know about certain key developmental events. And again, let me try and show you this. In the first 12 months we have a great deal going on in the brain. We have all sorts of brain development happening and we also have the beginning – we have certain events of mother-infant interaction, or caretaker/caregiver-infant interaction. Usually it's the mother, but – which leads the infant to begin to distinguish gender in its world even before it is verbal. So, we have by about, let's see, eight months, a child can tell male from female voices, it can, we also can tell faces as well. The mothers engaging in interactions differently with boys and girls in this period, and at the same time, their brains are developing very actively. There is a kind of rather sudden shift at about 15 months and goes, and I'm referring to these gendersex recognition skills and direct interactions and begins to move between 15 and 18 months. The infant, suddenly, it seems suddenly because three months is a short period of time, begins to have the lightbulb about gender as a thing come on. And they begin to have a metaphor of a gender association, gender labelling and really begin to consolidate symbolic gender sex within from about 18 months, two years to three years of age. Well, that's some things we know about the timing. It's just an overview. But what I want to do is spend, so first we have this pretty

symbolic period which I've divided into a zero to fourteen months. We have this phased transition to symbolism at 15-18 months. And then we have the symbolic gendersex which emerges at 18-36 months. And I want to talk a little bit more about this pre-symbolic period.

23:25:
The timing raises unanswered questions. We know a lot about when, especially 18-36 months, but earlier zero to 12 months, we do not know much if anything about how multi-level events are integrated. We don't even really know which of the important events in terms of gendersex and identity. And then the phase transition of 15-18 months, how does the accumulation of information that's been gathered in the first-year touch, motor, verbal, emerges as an integrated summary self-judgement about gender itself, as Egan and Perry worded it.

24:04:
So, let's look at the zero to twelve months very briefly. My argument is that from birth or even before, infants swim in a sea of gender. This comes from the clothes they wear, you can see in this case, this child, but many of you would guess that this is a little girl dressed in pink and frills. You may not be too sure about these kids, but this one is blue. It's Mickey Mouse, but I'll leave you to guess which sex this has been identified at at birth. They experience different movements and I want to, probably the sound won't come out on this but it's fine because it's not very audible anyway and what I've given you is the transcript here. But here you have a father, actually, holding the child and swinging him. I know this, there's sound. Saying, 'come on, wow, look what I did.' So, the child is being held up to kick the ball and getting a lot of excited feedback about kicking the ball. So, this child is experiencing this kind of movement at an age that's quite young. And so how does that get embodied into his nervous system? They hear different words, for example, I listened to 30 minutes of non-stop tape as mothers diapered, fed, played with their infants, and they, and I've just coded the red as the girl babies, this one girl baby and this one boy baby. And just coded the number of times the mother used certain kinds of language and so they used 'happy' and 'cute' a couple of times. The boy was 'handsome'. They said 'good girl' or 'good boy' quite a lot. So, they're learning the words 'boy' and 'girl'. And then I categorised the words as to type of word and the boy hears words about movement, 'oh, look, you're flying, look you're walking, look at you sit.' Quite a bit more than the girl than the girl did. Terms of endearment, and then this, which I'm gonna just mention a little bit more, gendersex aspirations. And these early takes, these are three-month-old children to point seven-month-old children. The mothers are narrating everything because the babies are pretty helpless and the mother's trying to sort of bring them into the world of independence. And so, what do I mean by gendersex aspiration? And here I'll give you two more very brief clips. Again, the audio is not that easy, but I've transcribed it for you in the inset. 'Where are you going? He wants to stand up. Pretty soon you're gonna be walking and I'm gonna be chasing you.' And also, 'remember the days when I used to be able to chase you around?' So, that's kind of one kind of aspiration, you're going to be walking, I'm gonna be chasing you up. Here's another one, the 'look at you standing up, you gonna walk? You could do the floor for me; you could do the vacuum. That's what you gotta do, get nice and big. So big.' So, these are two different kinds of aspirations and infants are hearing these aspirations again, this is a two point seven-month-old infant, both children are the same age.

28:19:
So, how can we put this all together? I want to put it all together and then open up the floor for discussion. I have all of the different parts that I've been mentioning, clothes, touch, movement, words, sex roles, peers, nervous system, brain, how can we put this all together? Or how does the infant put it together most importantly. So, I'm going to refer to a well-known literary metaphor here from literary theory. But if you say, 'in the first chapter that there is a rifle hanging on the wall', and here I've changed metaphors with you, I just want to point out that the rifle hanging on the wall is the equivalent of the water the baby is swimming in from the sea of gender. 'Then in the second or third chapter it must absolutely go off'. This is known as 'Chekhov's Gun', and there here's a set from one of Chekhov's plays and here's that rifle hanging off the wall and it's just there. And the Russian formalists would call this a period of familiarisation. The gun is in the background, gender's in the background. The gun is on the wall, it's part of the fabric of the scene. The baby doesn't notice the surrounding water, doesn't notice the clothes, the maternal chatter, the naming of boy or girl or the different movements, per se, it's just mother playing with instances. I'm completely familiarised. But then in the second act, the gun gets noticed. This is from a play by Ostrovsky called 'The Poor Bride', when the character says, 'what's hanging up there in case?' This is a Turkish gun weapon, and they take the pistol off the wall and discuss it and then set it aside on the table. Now, the analogy with the infancy is that between the 15 and 18 months the sea of gendersex, that is the gun on the wall, becomes visible. The infant defamiliarizes from its surroundings and for the first time sees and experiences gendersex. The infant starts by 18 months, starts to use words to name gender. It develops categories or schema to arrange gender. It starts to express gendersex in its own body via movement, emotions and desires. In other words, gender moves from a period of familiarisation where it is so much in the background that it is noticed so that 'aha' moment when gender becomes defamiliarized and the infant begins to incorporate it more consciously and subjectively. So, the gun goes off in the play by Ostrosky and then in the next act, 'K' shoots another character with the gun. And so 'bang', by 18 to 36 months, and this is how it seems to a lot of parents, gendersex is visible and consolidates as a subjective identity. And I've just used to illustrate this in closing out the illustrations from the artist, JeongMee Yoon and I have her website her of children, of a little boy obsessed with his blue things and two girls with their pink things. The gender gun has definitely gone off in this. So, I am going to hope we can solve the audio problem now on my end and move back to open up for discussion.

31:50:
LS:

O.K. Suki, do you wanna ask your question out loud?

31:55:
Dr Suki Finn:

Sure. Hi, thank you so much for your talk. So, yeah, as you saw from the chat, I was wondering about those who at least attempt to bring up children genderless and then there's also, I suppose, attempts to bypass gender in later life as well. And so, I understand from your, from what you said earlier that you think there's this spectrum but that we can't help but be gendered. So, my question is mostly about those who at least aim to transcend

what gender is imposed on them or those who attempt to prevent gender being imposed on their children.

32:49:
AFS:

O.K. So, I think those are separate things. In other words, on one hand, you're talking about adults, or young adults or adolescents who are processing gender for themselves. That is, they are developing, maintaining, expressing to the outside world a subjective gender identity. And that's a different thing than parents in inner subjective interaction with infants attempting to have gender not in the infant's world. So, I don't think those – one is really a set of questions about can the inner subjective period of, you know, zero to twelve months effectively somehow eliminate gender from the infant's world? And I don't think so. The question about how people who are subjective, children, adults, children, adolescents, adults, express their sense of gender in a world that is presented to them as quite binary, is a separate question and clearly there are a lot of people in that second category of subjective expression who are staking out different subjective positions with regard to a binary. And so, it's not really a question of how I see them, it's a question of how they see themselves.

34:31:
LS:

O.K. Will, you want to ask your question out loud or do you want me to read it from the chat.

34:35:
Will:

I'll do a very short version of it. Thank you very, very much. I was wondering if it is known whether, with respect to that fascinating slide about developmental take-off, whether there's any variation in that. Like, cross-culturally or in any other form. Is there anything that speeds that up or slows that down?

34:56:
AFS:

Yeah, that's a great question and I have no idea. So, it won't surprise you to know that the research that's been done that I've gleaned this from is almost all from what are now called 'weird cultures', Western-educated, industrialised and the credit cultures, you know, white, upper-middle class, European and American cultures, so the research data that I gathered, surveyed in order to come up with that graph is not cross-cultural. So, I think that graph, I put it up there because I saw a pattern that I wanted to get out to the world, and I think it's a pattern that then begs for asking empirically, exactly the question you've asked. May I just follow up in that I see nothing inherited that says this has to be the months this is happening in, this has to the absolute shape of the curve, it's just more an empirical report of what I see from the literature that exists.

36:18:
Will:

If I could have a tiny follow up on that? We might know even with a kind of Western sample, building on Suki's thought – there might be children that throw their children into the sea of gender really enthusiastically and other people who sort of try very hard and they won't be able to do it completely of course, but they will nonetheless censor themselves a bit with respect to those forms, language, stuff like that, and so, even within the Western sample, like, is there a sort of large variation in the inter-quartile range or something?

36:50:
AFS:

Well, we're actually, where this really interesting data is just starting to emerge is from families who were raised by same-sex couples. And there are a few studies. And of course, gender isn't absent, even gender roles aren't absent in those couples, but they maybe have different shapes, they may be less extreme than sort of the traditionally heavily binary family. So, and even in the data sample I had from the 30 infants that I looked at, there's quite a bit of variability between parents who are dressing their sons in football outfits from the time, football onesies, and ones who are just dressing the kids in overalls whether they're boys or girls. But I do think that there hasn't been enough of an attempt to assess that variability of gender and emphasis. It occasionally shows up in a study here or there but now that same-sex parenting is a thing, it becomes possible, actually, to design studies that would be pretty interesting. And it's super important to assess parental points of view. An awful lot of developmental psychology treats the infant as if it were an autonomous subject. And I've been studying the history of this recently for a paper I'm writing. And it's fascinating because you go back to these studies of motor development in the 'Thirties that sort of established the norms of infancy and they treat even new-borns as if they were independent individuals when clearly they aren't. So, studies that we do now I think, need to include studies of the caregivers as well as studies of the infants.

38:59:
LS:

Thanks. Giuliana has her hand up.

39:03:
Professor Giuliana Pieri (GP):

Thank you. And in fact, as she did, the last thing you've just said about the kind of caregivers, sort of wanted to ask you because I was just sort of reminiscing about the early days when my children were very little. As soon as I sort of began to send them to nursery school, socialising them, you know, when they were about eight months and I had to come back to work. Then you start to sort of see, you know, like a consumer being horrified by the fact that, you know, certain sort of types of toys appeared and then my children were gravitating towards them. So, my question is, did any of this sort of research now that you do or that you've seen that is happening in your field, how does that also interact with kind

of, maybe, early years pedagogy? Is there anything that, you know, in a sense – I don't know, I just wonder whether there's an interesting interface between some of your observations and the kind of analysis that you've done and then some of the things that one can sort of also try to do when you see children in a kind of, you know, when they socialise in that type of environment.

40:13:
AFS:

I guess I'm not entirely clear what you're asking me.

40:20:
GP:

Yes, sorry. I'll try again, it's probably because I'm trying to sort of get it straight in my head. It seems to me that this kind of stuff, the sea of gender that you talked about it also something that comes not just from you. You focus a lot on the kind of parents, but I was thinking, as soon as you are eight months old, you know, you might also, or even younger sometimes, you might be interacting with other children and so, how does that affect, you know, maybe the way in which you perceive or learn about your gender?

40:58:
AFS:

Well, I think that the inter-subjectivity at first is just between caregiver and infant but it's not only between caregiver because there are peers, there are other adults, there are maybe siblings. That's all part of the sea of gender and there are a few studies here or there that look at say, differences between gender socialisation in children who have an older sibling of one sex or the other, but that hasn't been done systematically because psychologists have been so obsessed with being 'good scientists' and limiting their variables that the tapes that I have, which I didn't record myself originally but were given to me for research purposes by a colleague who took them – they were all of first time mothers so there wasn't siblings in the mix. The mothers weren't working, I mean there were a whole series of things that were done to, quote 'keep the sample simple and objective', rather than going towards the actual complexity of how gender socialisation occurs. So that sea of gender includes other people, and the inter-subjectivity is not just a dyadic interaction although in the very first months it's probably more dyadic than not. But if there are siblings that are involved, depending on what age the child goes to day-care, you know, there will be peers and other adults, there are grandparents, I mean, who may have been involved in caregiving, who may have rather different gender points of view than the parents, or not. So, there's a lot going in there. I hope that's responsive.

42:57:
GP:

That's fantastic. I mean, there's just a kind of dazzling complexity.

43:01:
AFS:

It is. It's an incredible complexity.

43:06:
LS:

So, I had a question to add on since we have a lull in hands for just a second. In my field of gender and international relations, sometimes there's kind of a 'strong-man' usage of, especially evolutionary biology, where there's some combination of the argument that conflict and gender subordination are endogenous to evolution. But then, the law can fix it because the law can stop evolution and biology. And so, I guess that one of the things that I have always wanted to do is kind of, send some of that work to somebody who really thinks about the ways that people develop and ask, does that sound as crazy to you as it sounds to me?

43:55:
AFS:

Oh, yeah. It does. And I think it's a question – it's really badly done evolutionary biology. So, for whatever reasons, gender dimorphisms may have evolved. The other thing that's evolved is this huge flexibility in this long learning period in humans and that's why the whole notion of process versus fix trade is so important. We have developmental process that affects every single human and so that we're not born with these traits wired into us, we're born through the potential for traits and the traits that we exhibit, there certainly has been evolution of our brains and evolution of our bodies to do things that are related to reproduction, that's all obviously true. They do not ordain our roles or personalities. And there's been, there's a lot of feminist critique of this, so there are good evolutionary biologists who study the evolution of sex roles who would also not agree with statements like that. I particularly find that economists tend to latch onto this stuff and just completely misuse it.

45:13:
But I think that one of the, that that kind of speaks to one of the most difficult things for translating this work is trying to figure out how to articulate this kind of complicated relationship between the biological and the social when you're doing work on things like politics or economics or something like that. Do you have some kind of ideas about what you think are good ways to do that versus less good ways to do it?

45:43:
AFS:

Yes: forget about the biological. I don't see for most day-to-day things, other than, you know, other than maybe lifting heavy weights with a small frame and even there there's really interesting things about learning how to lift and stuff but for most day-to-day things I just don't see how the biological is particularly relevant.

46:15:
LS:

Thank you very much. We really appreciated having you and we were thrilled to have this conversation at the Gender Institute at Royal Holloway. And we would love to continue the conversation over email and social media for quite a while after this. We really appreciate this so thank you very much for coming.