

[← Thread](#)

ScienceVet
@ScienceVet2

...

So. Hi new people! Apparently, we're gonna talk about sex. Like physical sex! Because... there's some confusion.

First, sex defined: We're talking physical sex here, not gender. Body parts, hormones, and genetics (and more).

BLUF: BIOLOGICAL sex is a spectrum

1/

12:21 PM · Aug 30, 2018 · Twitter Web Client

17.9K Retweets 5,829 Quote Tweets 37.5K Likes



Tweet your reply

Reply



ScienceVet @ScienceVet2 · Aug 30, 2018

...

Replies to @ScienceVet2

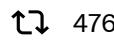
Ok, everyone's super familiar with the XX/XY dichotomy, right? Yeah, what we all learned in like... 4th grade? And that's great, it gives you a starting point. But it's... well it's only the very starting point.

The IDEA is, XX is girl, XY is boy, right?

2/



21



476



4,436





ScienceVet @ScienceVet2 · Aug 30, 2018

...

Welllll... that's not totally right. There are XY people, who have ovaries! And give birth! AH! And XX people who have male bodies and functional sperm! Double AH!

3/

💬 73

🔁 644

❤️ 5,405

↑



ScienceVet @ScienceVet2 · Aug 30, 2018

...

These are usually written off as "abnormalities" and indeed, some cases have medical issues. But many don't (like the XY woman giving birth). And this is really only the very very tip of the iceberg of "wait, that doesn't fit into our M or F box unless we make it bigger"

4/

💬 37

🔁 337

❤️ 4,549

↑



ScienceVet @ScienceVet2 · Aug 30, 2018

...

There's a WHOLE HOST of things that can cause all sorts of "weird" things to happen, ranging from genetic (XXY, XYY, Y, X, XX with translocation, XY with deletion) to hormonal (Androgen Insensitivity, Estradiol failure), and disruptors like dioxins

/5

💬 31

🔁 373

❤️ 4,423

↑



ScienceVet @ScienceVet2 · Aug 30, 2018

...

So, you're a scientist, and you want to research stuff, right? Which means you have to categorize stuff. Without categories, data is hard! So you take allll these people, including the "weird" ones and you plot them on a graph. Logical!

/6

💬 10

🔁 241

❤️ 3,884

↑



ScienceVet @ScienceVet2 · Aug 30, 2018

...

-1- ScienceVet on Twitter - So. Hi new people- Apparently- we're gonna talk about sex. Like physical sex- Because... there's some confusion.

You use all the differences there are, different genetics, different responses to hormones, different effectiveness in signalling pathways, different sizes in Aanteroventral periventricular nucleus (AVPV) (yeah that's a thing) and give everything numbers, add them up.

/7
7

208

3,460

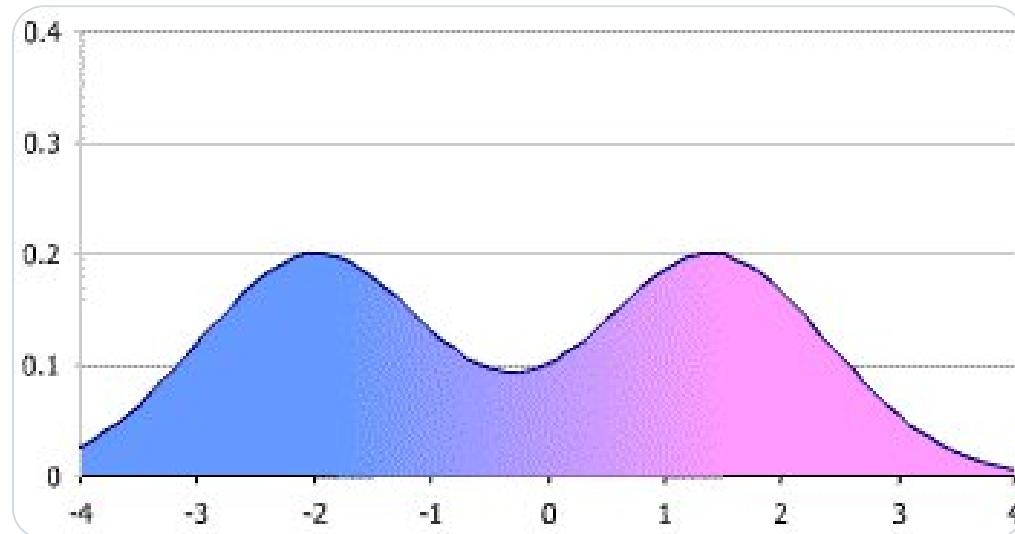


ScienceVet @ScienceVet2 · Aug 30, 2018

...

You get what's called a bimodal distribution (mostly, we'll get to that later) Which looks like this. Those two big peaks are what we call "male" and "female" (even conveniently colored pink for boys and blue for girls - we are using victorian gender colors right?)

/8



95

838

6,652



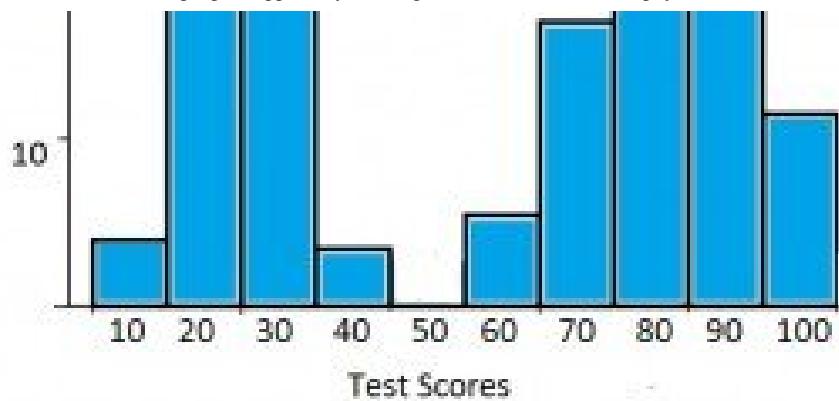
ScienceVet @ScienceVet2 · Aug 30, 2018

...

Now, when you're trying to look at data, we often group stuff. When we do that with a plot like this, it's called a "histogram." Basically we're breaking down a curved line into discrete "bins." Like this (image stolen from the web).

/9





7

194

3,236

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

Traditionally, we've used REALLY BIG bins for this when talking about sex. Basically you either group everything vaguely near a peak into the peak, or you just pretend there's nothing else but the biggest peaks. This makes it super easy, because 2 is simple to do data with.

/10

8

249

3,566

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

However, as we've gotten to know more and more about signaling and brains and hormones and started to pay more attention to the outliers where standard stuff just didn't seem to work, we discovered that this isn't a great model to use.

/11

3

232

3,654

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

Now I'm not talking feelings here. I'm talking about data. As you start to look at anything interesting, like say the effects of 2,3,7,8-Tetrachlorodibenzo-P-dioxin on animals, you start to realize that a 2 bin model doesn't predict your results well.

/12

9

276

3,833



**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

At first you say, "Well it was just weird." So you redo it, and it still doesn't work. So you look at your model and you say, "Well ok, what if the model's wrong?"

But the model sort of... almost predicts a lot of things, and it worked for years, so...

/13

2

166

3,259

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

Some enterprising soul says, "Hey, remember that histogram where we said we'll just model using the peaks?" And everyone goes, "Uh, yeah?" And they say, "What if we... USED that data?" And everyone groans, because complicated data is hard.

/14

2

227

3,794

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

But someone sits down and does the work, and lo, wow the model starts to work again. Where TCDD was "randomly" turning some boys into girls but then some girls into boys, now you can see there's a subgroup of what you'd called "female" that responds like the "male"

/15

7

216

3,413

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

What's important here is that you haven't MISLABLED males as females. These are functional "females" who can do all the usual "female" things like gestate babies. But they respond to this one endocrine disruptor in a "male" way.

/16

4

247

3,593



ScienceVet @ScienceVet2 · Aug 30, 2018

...

So you add another two categories, call them "Male2" and "Female2" and go on, happy that your model works! You've got 4 sexes now, but you don't really have to tell anyone that, right?

/17

10

215

3,359



ScienceVet @ScienceVet2 · Aug 30, 2018

...

Exceeeept then you remember you've got those XY people that gestate babies. So you add "Intersex1" And then the XX people with penes... and ovaries? Ok, "Intersex2" because all these groups respond differently with signalling and brains when you get into the weeds

/18

11

216

3,408



ScienceVet @ScienceVet2 · Aug 30, 2018

...

And the more you look, the more we LEARN, the more we're able to separate out those fine differences. Depending on what we're doing, we may not care. If a doc is giving you aspirin, it probably isn't a big deal.

/19

3

186

3,307



ScienceVet @ScienceVet2 · Aug 30, 2018

...

But if they're using a steroid on you? Or treating dioxin poisoning? THAT SHIT COULD BE IMPORTANT. It's like saying, "the light's off so the power must not be flowing." It really matters if the light's off because the bulb blew.

/20

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230

3,891



ScienceVet @ScienceVet2 · Aug 30, 2018

...

If we go back to that histogram plot, we can keep breaking down your biological sex into smaller and smaller differences in brain areas, hormone

levels, signalling differences, genetic variances. There's nothing stopping us from binning EVERY INDIVIDUAL into their own bin.

/21

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t 290

3,734

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

Technically, this wouldn't be "infinite sexes" but 7.4 billion sexes is functionally close for our brains. Now, our medicine isn't advanced enough for THAT level of detail to make any difference. BUT IT MIGHT BE in the future. Individualized medicine!

/22

9 17

t 373

4,351

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

The thing to remember is that this isn't "new." We're not 'inventing sexes' here. Sex has ALWAYS been this curve. We were just using REALLY BIG bins. And now we're realizing that that's not representative of biology, it's inhibiting understanding of medicine and biology

/23

9 18

t 1,270

6,927

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

In case anyone's curious, this isn't ideology. This is because I had to figure out why my data didn't match the prediction. Those rats I mentioned? Yeah, my lab. And lab rats are a really pure genetic monoculture, and they STILL don't fit the two peak model well.

/24

9 19

t 381

4,853

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

So, since it's come up, an addendum!

Yes, we looked at other things we could do to make our data fit the existing model, that's how science works! The ONLY way the data fit was if we let "sex" be more than just those two narrow peaks.

/25

10

↑↓ 219

♡ 3,658

↑

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

Models purpose in science is to predict. If they don't predict correctly, first we check if we've measured the data correctly, and repeat the experiment a couple more times. If it still doesn't fit, we have to look at the model.

/26

Q 3

↑↓ 230

♡ 3,441

↑

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

Intersex! Because I didn't specifically mention this above.

"Intersex" is a term used to collectively speak of the "middle ground" of biology where people can't easily be binned into those two big "male" and "female" peaks. It can include a large range of biology

/27

Q 8

↑↓ 228

♡ 3,363

↑

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

It is worth noting that I never talk about transgender in this thread. Intersex is not the same as transgender. You can be one without the other, or be both.

/28

Q 11

↑↓ 246

♡ 3,702

↑

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...

For people who think this is just "outliers"

Current estimates are that the intersex population is at least 2%. We know that's low because there are a lot of "invisibly intersex" people. That means AT LEAST 150 million people in the world.

/29

Q 38

↑↓ 535

♡ 4,386

↑



ScienceVet @ScienceVet2 · Aug 30, 2018

...

I apologize for the failure to use the word "intersex" higher up in the discussion. Many people in the middle ground (including the XY person who can carry a child, for example) use this term. I cannot go back and edit the thread, and apologize for my overly clinical description.

6

145

3,384



ScienceVet @ScienceVet2 · Aug 30, 2018

...

Part of the purpose of the thread, which may have failed, was to point out that "intersex" is not a condition, it is not a disease. It's natural with a bimodal distribution. Science not only supports this, it suggests that ignoring intersex people makes your conclusions wrong

44

934

6,780



ScienceVet @ScienceVet2 · Aug 30, 2018

...

Here is a solid explanation of the embryology of sex organs and how that relates to a sex spectrum and intersex people.

intersexroadshow.blogspot.com/2011/01/phallo...

13

290

2,801



ScienceVet @ScienceVet2 · Aug 30, 2018

...

A human result of the scientific conclusion that sex is a spectrum and intersex people are a perfectly normal result of nature, is that there is no scientific rationale for medically (or culturally) forcing people into those two peaks.

85

735

4,622



ScienceVet @ScienceVet2 · Sep 1, 2018

...

A note here that I am muting the thread, not because I don't want to respond but because I did not expect it to blow up so much, and I have family and work to take care of. I'll try to wander back, but can't guarantee how much it will be.

12

35

1,455



**ScienceVet** @ScienceVet2 · Sep 2, 2018

...

Another addition, because a couple people have asked about it.

3

72

1,287

**ScienceVet** @ScienceVet2 · Sep 2, 2018

...

For example: XX people with female secondary sex characteristics, and ovaries who won't menstruate and can't carry a child without adding external (exogenous) estrogen. People like this often have difficulties finding good endocrinology care.

3

74

1,345

**ScienceVet** @ScienceVet2 · Sep 4, 2018

...

One more note here: This was meant to be an informational thread, based on my own data/experience as a scientist. I am not the be-all end-all of science and don't claim to be. There are rational scientists who disagree with me.

4

52

1,240

**ScienceVet** @ScienceVet2 · Sep 4, 2018

...

Neither, though, do I have time for a full-on scientific debate on Twitter. Maybe we can talk at an Endocrine Society meeting or something. Unfortunately, I do have a life and stuff to do. And Twitter pays no bills.

9

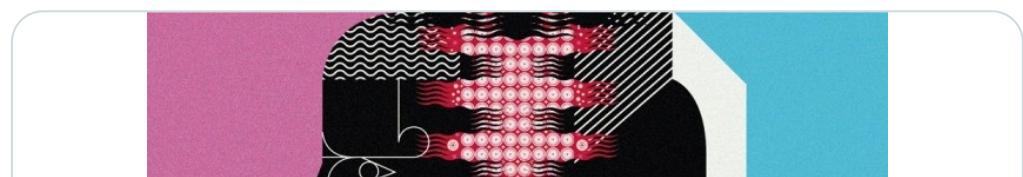
38

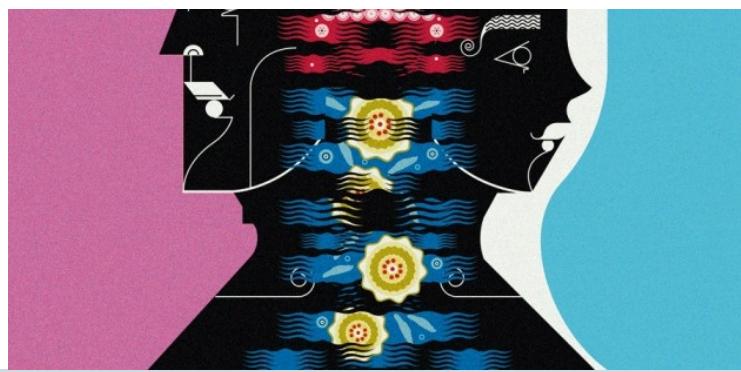
1,211

**ScienceVet** @ScienceVet2 · Sep 13, 2018

...

Many people have asked for reading and papers. This is an opinion piece, which I largely agree with, that references some of the more common human-based scientific papers people use to discuss this issue. Others interpret these same studies differently





nature.com

Sex redefined

Nature - The idea of two sexes is simplistic. Biologists now think there is a wider spectrum than that.

8

140

1,205

↑



ScienceVet @ScienceVet2 · Sep 13, 2018

...

And one more note that "spectrum" does not mean that there aren't clusters of people. Just like the spectrum of human voice range has more baritones than super-bases.

6

74

1,213

↑



ScienceVet @ScienceVet2 · Oct 24, 2018

...

Several people have asked about the physical structures of brains that differ between sex. This work ties in neatly with what I was saying above. There's many systems and pieces of physiology that each vary, along with the sum-brain/behavior that results. sciencemag.org/news/2015/11/b...

5

117

1,094

↑



ScienceVet @ScienceVet2 · Nov 6, 2018

...

As this is twitter, and I'm not speaking as a representative of an institution or as part of my job, I have not shared proof of my credentials. I don't want to risk labs/schools I've worked with (or family) getting harassed when they didn't volunteer that information.

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24

860

↑



ScienceVet @ScienceVet2 · Nov 6, 2018

...

I know that makes things more difficult for those trying to do their research,

but it's the reality of the platform.

But I can provide some more sources for those actually interested. They include some fairly heavy duty science, but some are open access/free for all

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21

788



ScienceVet @ScienceVet2 · Nov 6, 2018

...

Sources:

These deal with the fact that the sexually dimorphic brain, similar to most sex differences, does not fall into a hard binary readout - but rather is on a continuum or spectrum with each cell and each brain region comprised of varying degrees of 'male' and 'female'

2

48

845



ScienceVet @ScienceVet2 · Nov 6, 2018

...

Hines M (2005). Brain Gender. Oxford University Press: Oxford

Joel D, McCarthy MM (2016). Incorporating sex as a biological variable in neuropsychiatric research: where are we now and where should we be? Neuropsychopharmacology [ncbi.nlm.nih.gov/pubmed/27240659](https://pubmed.ncbi.nlm.nih.gov/27240659)

2

53

762



ScienceVet @ScienceVet2 · Nov 6, 2018

...

This paper deals with the complications of epigenetics that can divert the genetic sex and gonadal hormone pathways in subtle ways to produce large trajectory changes. Epigenetics plays a large role in estrogenic apoptosis via DNA methylation.

3

32

711



ScienceVet @ScienceVet2 · Nov 6, 2018

...

Gregg C, Zhang J, Weissbourd B, Luo S, Schroth GP, Haig D et al (2010). High-resolution analysis of parent-of-origin allelic expression in the mouse brain. *Science* 329: 643–648



pubmed.ncbi.nlm.nih.gov

High-resolution analysis of parent-of-origin allelic ...

Genomic imprinting results in preferential expression of the paternal or maternal allele of

 1

33

658

↑

ScienceVet @ScienceVet2 · Nov 6, 2018

...

This one with the interactions between social experience and biology

Springer KW, Mager Stellman J, Jordan-Young RM (2012). Beyond a catalogue of differences: a theoretical frame and good practice guidelines for researching sex/gender in human health. Soc Sci Med 74: 1817–1824

2

26

639

↑

ScienceVet @ScienceVet2 · Nov 6, 2018

...



pubmed.ncbi.nlm.nih.gov

Beyond a catalogue of differences: a theoretical fr...

Extensive medical, public health, and social science research have focused on cataloguing male-femal...

1

27

595

↑

ScienceVet @ScienceVet2 · Nov 6, 2018

...

@threadreaderapp unroll please and thank you

3

6

459

↑

ScienceVet @ScienceVet2 · Nov 6, 2018

...

And one on the heterogeneity of brains:

Joel & Sterling 2016. Beyond sex differences: new approaches for thinking about variation in brain structure and function. Philos Trans R Soc Lond B Biol Sci. 2016 Feb 19; 371(1688)



ncbi.nlm.nih.gov

Beyond sex differences: new approaches for thinki...

In the study of variation in brain structure and function that might relate to sex and gender, ...

 9 32 625**ScienceVet** @ScienceVet2 · Jan 30, 2019

Another small addition here...

...

I've gotten critiques saying that I'm claiming intersex people "aren't real men or women." That's NOT what the data says. What the data says is that the labels "real men" and "real women" are not accurate labels for ANYONE.

 3 128 1,199**ScienceVet** @ScienceVet2 · Jan 30, 2019

For example, outside of the more obvious cases, I naturally have a significantly lower resting testosterone level than my brother. This means a lot of things. It means I'm likely to respond differently to hormones or mimics/disruptors.

 2 28 679**ScienceVet** @ScienceVet2 · Jan 30, 2019

Give us both testosterone (or estrogen, or a bisphenol) and the results would be different. It doesn't make him or me a "real" man, it means we're in different places along the response curve. It means that "real" is an arbitrary line we've drawn.

 1 47 900**ScienceVet** @ScienceVet2 · Jan 30, 2019

Something new on the research end, is that it looks like sex phenotype has to be MAINTAINED in adulthood. That's actually a pretty huge change in our understanding. There's a gene that's required to keep your body the way it is.

 2 58 746**ScienceVet** @ScienceVet2 · Jan 30, 2019

ovaries/testes have to be maintained in adulthood and can change with changes in the right genes

...

Sex determination and maintenance: the role of DMRT1 and FOXL2

Huang et al, 2017



ncbi.nlm.nih.gov
Sex determination and maintenance: the role of D...
In many species, including mammals, sex determination is genetically based. The sex ...

Q 2

T 53

H 663

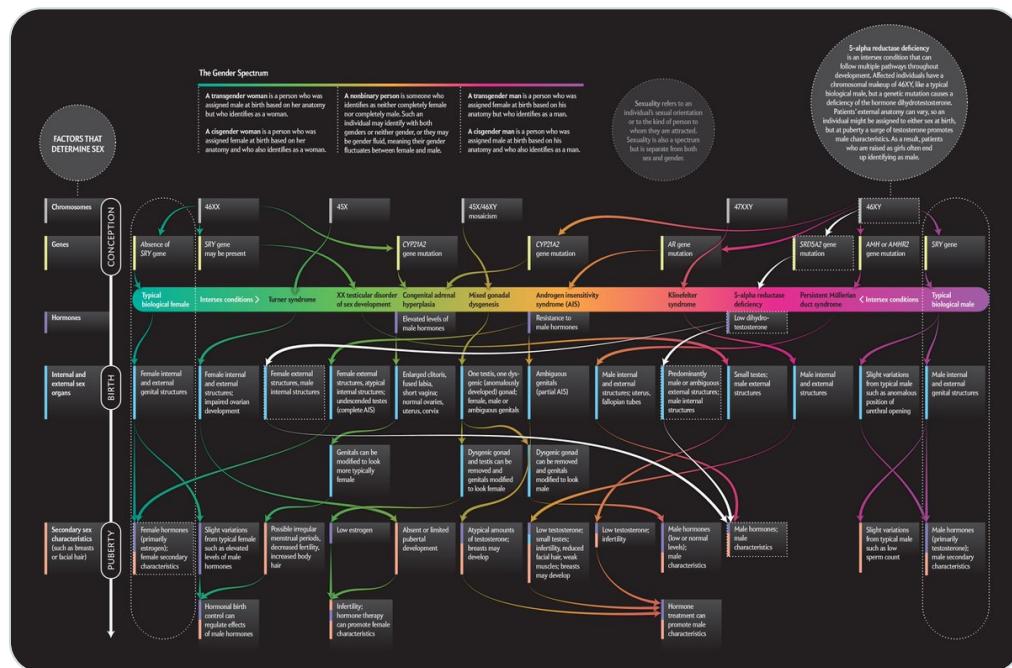
U



ScienceVet @ScienceVet2 · Feb 1, 2019

...

A graphic of SOME of the things that can shift sex determination around in humans. This doesn't get into some of the newer things like DMRT1 or FOXL2. But it gives you an idea of how many different paths there are even if we just look at base chromosomes/genes



Q 5

T 117

H 825

U



ScienceVet @ScienceVet2 · Feb 6, 2019

...

Another example. We've discovered there's a larger group than thought of "late-onset congenital adrenal hyperplasia." The default for these women has been to supplement with estrogen/progesterone. For some it works, but for many it can cause suicidal depression.

Q 3

T 34

H 660

U

**ScienceVet** @ScienceVet2 · Feb 6, 2019

...

i.e. trying to treat these women in the "there are two and only two" model - by trying to make their body chemistry match an idealized model - not only doesn't work, it can kill them.

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773

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**ScienceVet** @ScienceVet2 · Feb 7, 2019

...

This article does a decent job of encompassing a lot of the more recent discoveries. It also does a better job than most about talking about the non-obvious non-intersex parts of the continuum such as "non-classical" CAH.

[scientificamerican.com/article/sex-re...](https://www.scientificamerican.com/article/sex-re...)

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717

↑

**ScienceVet** @ScienceVet2 · Feb 7, 2019

...

It's important to talk about the non-obvious parts of the spectrum, as the people just a few steps out from the peaks of the curve can be hugely damaged if medicine doesn't account for the difference. And since it's easier not to, doctors often don't.

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700

↑

**ScienceVet** @ScienceVet2 · Feb 24, 2019

...

Local maxima/minima do not disprove a spectrum. I.e. if the world were mostly blue and red, it wouldn't disprove that there is a spectrum of light.

7

50

576

↑

**ScienceVet** @ScienceVet2 · Jun 14, 2019

...

This article has a ton of good links to primary sources, and does a good job of talking about how the spectrum extends past the "obvious" points and providing examples of how it appears even in those two big peaks at the ends.

blogs.scientificamerican.com/voices/stop-us...

9

131

652

↑



-1- ScienceVet on Twitter - So. Hi new people- Apparently- we're gonna talk about sex. Like physical sex- Because... there's some confusion. ...



ScienceVet · Jan 13, 2020

Someone recently brought up the issue of "phenotypes"

Blue eyed is an example of a phenotype, as is blond, or six fingered. It's basically a systems level expression of underlying biology.

A lot of people would like "male" "female" to be phenotypes.

3

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312



ScienceVet @ScienceVet2 · Jan 13, 2020

...

But then we're back to "what descriptive, concrete line do we draw between phenotypes to define two and exactly two?"

Genitals vary widely in shape and size, even if you don't include intersex genitals.

1

13

307



ScienceVet @ScienceVet2 · Jan 13, 2020

...

Ability to carry a fetus? Ask any gyno how complicated and variable that is, and how many ways a person can have or not have that ability.

Brains? As linked above, turns out we all have both "male" and "female" type structures in our brains.

1

13

331



ScienceVet @ScienceVet2 · Jan 13, 2020

...

Salivary constituent concentrations? Men have a huge range of salivary testosterone, that then changes as their age.

Blood hormones? Again, wildly ranging, and changing as you age.

2

13

298



ScienceVet @ScienceVet2 · Jan 13, 2020

...

You can talk about genotype, and a particular hormone level, or any individual piece, but in the end the systems level result, the phenotype is... fuzzy at best. Two big fuzzy probability mountains whose foothills overlap so you can't tell where each one ends/begins.

27

19

364





Alex Hughes (Capell) @ahugheswriter · Aug 30, 2018

...

Replying to @ScienceVet2 and @olde_fortran

Cool! *rubs hands in glee* Can you tell us more about your background and work? This seems important and outside the box so I'm trying to check my sources if that makes sense :)

7

5

232

↓

↑



ScienceVet @ScienceVet2 · Aug 30, 2018

...

Replying to @ahugheswriter

Background. My undergrad was in Neuroscience and I focused on molecular biology using circadian rhythms to do a systems biology approach. My Ph.D. is in Biomedical Sciences - Biochemistry and Molecular Pharmacology with a focus in molecular determinants of polarized exocytosis

21

57

1,662

↓

↑

Show replies



Lanae St.John, DHS, CSC, ACS @TheMamaSutra · Nov 26, 2019

...

Replying to @ScienceVet2

Can someone roll, thread, or otherwise tweet the magic word that will make this one tweet?

Thank you @ScienceVet2 Those who got their science from the 50's won't "get" this or will argue it's invalid. LOL

2

57

17

↓

↑



ScienceVet @ScienceVet2 · Dec 3, 2019

...

Replying to @TheMamaSutra



ScienceVet
@ScienceVet2

Thread reader

So. Hi new people! Apparently, we're gonna talk about sex. Like physical sex! Because... there's some confusion. First, sex defined: We're talking physical sex here, not gender. Body parts, hormones, and genetics (and more). BLUF:

BIOLOGICAL sex is a spectrum 1/ Ok, everyone's su...[Read Unrolled Thread](#)[Tweet](#)[Share](#)

threadreaderapp.com

Thread by @ScienceVet2 on Thread Reader App

@ScienceVet2: So. Hi new people! Apparently, we're gonna talk about sex. Like physical sex! Because... there's some confusion. First, sex ...

[1](#)[8](#)[36](#)[↓](#)[↑](#)[Show replies](#)**WATCH HEARTSTOPPER ON NETFLIX 🍂** @khach... · Feb 24, 2020 · ...

Replying to @ScienceVet2

[@readwiseio save thread](#)[1](#)[8](#)[36](#)[↓](#)[↑](#)**Readwise** @readwise · Feb 24, 2020

Replying to @khachbe

Done! We've saved this whole thread to your Readwise library so that you can revisit/remember it 📚

[1](#)[8](#)[36](#)[↓](#)[↑](#)**Thinck Finck (Jeremy) | ~ADHD~ | he... 🌻** @ThinckFi... · Feb 2, 2021 · ...

Replying to @ScienceVet2 and @asdellaportas

[@readwiseio save thread](#)[@threaderapp unroll](#)[1](#)[8](#)[36](#)[↓](#)[↑](#)**Readwise** @readwise · Feb 2, 2021

Replying to @ThinckFinck

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Stats:

- 2 saves of this thread (ranked #4120)

- 1 unique save of ScienceVet2's threads (ranked #3608)
- 2 total saves of ScienceVet2's threads (ranked #2838)



Thinck Finck (Jeremy) | ~ADHD~ | h... @ThinckF... · Feb 27, 2021 ...

Replying to @ScienceVet2

[@readwiseio](#) save thread

[@threadreaderapp](#) unroll



Readwise @readwise · Feb 27, 2021

...

Replying to @ThinckFinck

Done! We've saved this whole thread to your library so you can revisit/remember it 🧠📚

Stats:

- 2 saves of this thread (ranked #4836)
- 1 unique save of ScienceVet2's threads (ranked #4273)
- 2 total saves of ScienceVet2's threads (ranked #3346)



mahjacat7's Vaxxed & Masked 😊#BLM 🎨 @anit... · Aug 30, 2018 ...

...

Replying to @ScienceVet2

[@threadreaderapp](#) unroll



Bigh High @Telepathetica · Aug 30, 2018

...

Replying to @ScienceVet2

I forgot that science is actually really cool. Good stuff!



Lauren Pleska 🏳️‍🌈 @RadFemme74 · Aug 30, 2018

...

Replying to @ScienceVet2

Also, worth mentioning not everyone is only one set of genes or even chromosomes . There is mosaicism and chimerism. Each with its own particulars. Basically nature going "Hold my chromatin".



3

143



...

**Sam** 🇺🇦 🌈 @irishwol · Aug 30, 2018

Replying to @ScienceVet2

Now there's a thread to write home about. Cogent. Succinct.
Comprehensible.



15

15

**Janusz aka Kali** 🇪🇺 🇺🇦 ADHD/ENFP-T @kali187 · Aug 30, 2018

...

Replying to @ScienceVet2

Hate reading threads on Twitter, but this one was worth every second!
Thank you!



126

126

**Sel-By Date** 💛 💙 💕 💖 💔 💚 @S... · Aug 30, 2018

...

Replying to @ScienceVet2

Just out of curiosity, do anomalies in reproductive organs (e. G. Faults with the Mullerian ducts; bicornate uterus) affect a person's gender/other Sexual and/or gender-related biology?



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**Diana Pomeroy-Author and Artist (sh...** @Warriorfe... · Aug 31, 2018

...

Replying to @Sel_ByDate and @ScienceVet2

As such a person (I have MRKH II), in my experience, not necessarily. I accept I am intersex but I still consider myself she/her/female in gender. I am just one example, though.



4

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54

[Show replies](#)

This Tweet is from a suspended account. Learn more

**ScienceVet** @ScienceVet2 · Aug 30, 2018

...



Replying to @mrkhtake2

Why would the existence of a sex spectrum be intersex-phobic? I'm clearly missing something. Shouldn't intersex people be acknowledged rather than pathologized? Even when I went looking further, I found intersex people talking about being on a spectrum intersexroadshow.blogspot.com

6

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88

...

**Fat, Bald Dabus** @mr86400 · Aug 30, 2018

Replying to @ScienceVet2 and @squidlarkin

There's also a great episode (well, series of episodes) of [@Radiolab](#) a few episodes back that talks all about this. Not anything an expert wouldn't know, I'd wager, but if fellow travelers in this thread want to know more, I highly recommend it.

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23

...

**anywave** @anywavewilldo · Aug 31, 2018

Replying to @mr86400 @ScienceVet2 and 2 others

I enjoyed it, but I'm not a sex morphing fish I'm a female primate in racially structured capitalist patriarchy, to which end it wasn't of much practical use

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11

Show replies

**Dr Sonia Ahhh** @soniaahhhh · Aug 30, 2018

Replying to @ScienceVet2

This is some really well done sci-comms btw.

1

90

...

**Benoit Ranque** @RanqueBenoit · Aug 30, 2018

Replying to @ScienceVet2

Everything is biology is a mess isn't it? Not as clear cut as they teach us

1

13

...

**Dr Rupertthebear** @rupertthbear · Aug 30, 2018

Replying to @ScienceVet2

...

What other gametes are there on this spectrum apart from ova and spermatozoa and what role do they play in reproduction?



...



Kate Styles @bailey6117 · Aug 31, 2018

Replying to @ScienceVet2

Maybe this expert on intersex conditions can help with your hypothesis.
All bar one condition affect EITHER males OR females.

Threadreader

Read and share Twitter threads easily!

unroll

- Share great threads easily outside Twitter!
- Save great threads to read later!
- To unroll, tweet "@threadreaderapp unroll"



threadreaderapp.com

Read and Share Twitter Threads easily!

Thread Reader helps you read and share the best of Twitter Threads



Territorial Syntax @peterhughesdev · Aug 31, 2018

...

Replying to @ScienceVet2

I would so love to hear you talk about this with [@alieward](#) on the [@Ologies](#) podcast!



TheTopMostDog @TheTopMostDog · Aug 31, 2018

...

Replying to @ScienceVet2

When it boils down to it there's still only two reproductive 'classes'; the donor and the incubator. I'm sure there's overlap, and even some landing outside of either, but isn't that what we build our society upon; not necessarily what we have to base medicine and treatment on?





Nick Arrington @NickArrington52 · Sep 29, 2020

...

Replying to @TheTopMostDog and @ScienceVet2

To an extent this makes sense but to separate everyone based on whether or not they can/will mate isn't always necessary. It can actually be quite degrading if they can't mate.



1



12



A Meat @ameatxc · Aug 31, 2018

...

Replying to @ScienceVet2

Thanks for an easy to read and concise explanation I can link to people. It keeps frustrating whenever professors (biology or not) offhandedly brush off the failures of the two sexes model because it's a minority or whatever. This is all before stuff like mosaics and chimerism



4



141



Ruth @cincsem · Dec 20, 2019

...

Replying to @ameatxc @AmeatSa and @ScienceVet2

Amazing number of people claiming this is all made up nonsense- some of them medical doctors and THAT scares the shot out of me. Aren't doctors meant to keep up?



1



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kasey @kaseyklar · Aug 31, 2018

...

Replying to @ScienceVet2 and @Jam_sponge

Hey I'm sorry if someone's asked, but I don't see it anywhere in the replies. Do you have any sources on hand for this specific data, or places I could do some further reading? I'm with you every step of the way on this, I just want to have a bunch of sources to shoot at people!



2



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kasey @kaseyklar · Aug 31, 2018

...

-1- ScienceVet on Twitter - So. Hi new people- Apparently- we're gonna talk about sex. Like physical sex- Because... there's some confusion.

Replying to @kaseyklund and @JanSpengler into this

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Dr. Karin Lagesen @karinlag · Aug 31, 2018

...

Replying to @ScienceVet2

@Radiolab did a great series about things like this this summer which explains a lot. Listen here:



1

1 5

1 48

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Mark Szuch @Marszucs · Aug 31, 2018

...

Replying to @ScienceVet2

The ramifications to clinical research could be profound. Diseases like fibromyalgia which typically hit females most often could be sub categorized to improve predictive value of research data, furthering efficacy and safety information. Thank you for sharing.

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Kai Zokai @KZokai · Aug 31, 2018

...

Replying to @ScienceVet2

If I remember correctly these "abnormalities" are... 2%. Should we change everything because a really small percentage of the population don't fit in ? IMO no.

37

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57

**MysteriousAliWays** @MysteriousAliWz · Aug 31, 2018

...

Replying to @KZokai and @ScienceVet2

2% of humanity is a hell of a lot of people.

1

68

[Show replies](#)**Björn Melzer** @BjoernMelzer · Aug 31, 2018

...

Replying to @ScienceVet2

Nice thread 😊 I'm curious though: i can understand "XY who can bear children" Y is somehow deactivated, all fine. But how does "XX with functioning sperms" work? Isn't the whole switch for "male sex organs" on the Y-chromosom?

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**Peta Groves (Jack)** @kiescianzaryth · Aug 31, 2018

...

Replying to @BjoernMelzer and @ScienceVet2

Yes, but it's not the entire Y chromosome- just the Sry (sex-determining region Y) gene. Translocation of the gene locus onto one of the X chromosomes during meiosis crossover transfers the "switch for male sex organs" (initiation of male sex determination) across very nicely.

2

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113

[Show replies](#)**Tim M** @schmberg · Aug 31, 2018

...

Replying to @ScienceVet2

If mic-drop-and-leave-twitter was a thing, this world be close to it. Not personally ever been in ambiguous position, but have seen so many hovering around that place

16

**Midwestern Hedgie** @MidwestHedgie · Aug 31, 2018

...

-1- ScienceVet on Twitter- -So. Hi new people- Apparently- we're gonna talk about sex. Like physical sex- Because... there's some confusion.



Replies to @ScienceVet2 and @VerbingNouns
Haven't gotten past the first tweet yet and already I've learned two things...



meaning bluf



[BLUF \(communication\) - Wikipedia](#)

[Wikipedia](#) › [wiki](#) › [BLUF_\(communicati...](#)

A BLUF (Bottom Line Up Front) is a paragraph where the conclusions and recommendations are placed at the beginning of the text, rather than the end, in order to facilitate rapid decision making.

[BLUF \(fetishism\) - Wikipedia](#)

[Wikipedia](#) › [wiki](#) › [BLUF_\(fetishism\)](#)

BLUF is an international fraternal organization of gay men and MSM sharing a fetishistic interest in leather breeches and uniforms.



1



25



[writing.exchange/@IzabelaKaram...](#) @IzabelaKaram... · Aug 31, 2018 ...

Replying to @ScienceVet2

Thank you for all this. Nothing more frustrating than people using 4th grade science to deny the existence of so many variations and diversity in humanity.



3



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209



[Tricia #IStandWithUkraine](#) @TriciaFrasman · Nov 20, 2018 ...

Replying to @IzabelaKaramia and @ScienceVet2

Humans are dimorphic, intersex conditions do not disprove this



[Tricia #IStandWithUkraine](#) @TriciaFrasman · Jun 11, 2018

1/ Is sex really a Spectrum?

There are a couple of articles which have been widely quoted as "proving" that sex is not binary, but rather a spectrum. The main article is this one:
nature.com/news/sex-redef...
Show this thread

2

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Show replies



Jasper Winkel @the_Sage_BB · Aug 31, 2018

...

Replying to @ScienceVet2

Hey @Steejo this thread does a better job of explaining than I did the other day, while focusing only on biological sex without getting into feelings, gender identity etc.

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This Tweet was deleted by the Tweet author. Learn more



ScienceVet @ScienceVet2 · Sep 1, 2018

...

And I'm a Ph.D in Biochemistry and published in the fields of endocrinology and sexual differentiation.

And this would be why a lot of people aren't getting good endocrinology care.

140

145

3,620

↑

Show replies



Ca Dozo 🇺🇸 @Cdozo · Aug 31, 2018

...

Replying to @ScienceVet2

I'm over 60 years old, and my mom taught me about this when I was growing up. Fewer details were known back then, but she taught me biological sex wasn't limited to just two types, that genitalia and sex organs could be jumbled and that hormones levels and mixes were variable.

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Ca Dozo @Cdozo · Aug 31, 2018

...

Replying to @Cdozo and @ScienceVet2

She also taught me that the hormones a developing fetus was exposed to in the womb affected sexual development and behavior.

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Show replies



RENZO. | Ren Phillips @RENZO_UK · Aug 31, 2018

...

Replying to @ScienceVet2

Man someone summarise this thread for me please

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sof cat @Loloflip · Aug 31, 2018

...

Replying to @RENZO_UK

The TL;DR (as I understand it!): the two sexes as we know it (male XY and female XX) are actually on a huge spectrum, and millions of people are jumbled somewhere in the middle. So like, we should be more open to the idea of intersex folks and all that.

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Jonathan Baker @_thanbo · Aug 31, 2018

...

Replying to @ScienceVet2 and @seananmcguire

But the world he describes IS two really big bins. 98% of people are bog standard men or women, 2% are intersex. This is not the 0.2% who are actually trans, or the hard to track nonbinary. It's a graph like the old World Trade Center with the 4 story Custom house in between.

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Jonathan Baker @_thanbo · Aug 31, 2018

...

Replying to @_thanbo @ScienceVet2 and @seananmcguire

2/ And a lot of intersex forms were already known in late antiquity. Not the biochemistry, of course, but the Talmud (written 200-500 CE) has those with both gonads, with neither, eunuchs, women or men who never mature, etc. Biological presentation and social behavior.

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Show replies

**CISNE** @CISNE_CO · Aug 31, 2018

...

Replying to @ScienceVet2

I think the reason people are so adverse to these findings (as was I, earlier in the year) are because of their use in social constructivist theories and subsequent philosophical positions that argue for the truth being non-existent. 1/2

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123

**CISNE** @CISNE_CO · Aug 31, 2018

...

Replying to @CISNE_CO and @ScienceVet2

But after you observe the differences in the scientific data, it is so obviously the case that this is the truth, and that it does not constitute a destruction of the truth, but a way to tell it differently - and truly, more accurately 2/2

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158

Show replies

**TiredMeeM** @TiredMeem · Apr 24

...

Replying to @ScienceVet2

@Readwiseio save thread

1

**Readwise** @readwise · Apr 24

...

Replying to @TiredMeem

First public save of this thread!

Readwise users: Like this reply to save ScienceVet2's thread to your account without cluttering their replies

Stats:

- 3 total saves of ScienceVet2's threads (ranked #10498)

This Tweet was deleted by the Tweet author. Learn more



ScienceVet @ScienceVet2 · Aug 30, 2018

...

Replying to @LeicaDork and @medusaxy

I wouldn't want to base any secondary conclusions or gamble my funding on them. To the first, there is evidence but I really want to see a much bigger study because humans are notoriously genetically diverse. To the second... behavioral tendencies are so... squishy.

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342



Show replies



James Hargrove @akajdrakeh · Aug 30, 2018

...

Replying to @ScienceVet2 and @alendrel

Thank you for this.

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Deuteronomy 15 NIV @Cliffhuckers · Aug 31, 2018

...

Replying to @ScienceVet2 and @rachelvmckinnon

So either make a lot more bathrooms or admit that you're already sharing bathrooms with people who aren't strictly "boy" or "girl"

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Dr. Veronica Ivy @SportIsARight · Aug 31, 2018

...

Replying to @Cliffhuckers and @ScienceVet2

Well my guess is that he happily admits that...but the transphobes are the ones who struggle.

0

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Jennifer Deitloff, PhD @SalamanderJenn · Aug 31, 2018

...

Replying to @ScienceVet2

I enjoyed your thread. I'm not familiar w Twitter acronyms so I read "BLUF" as "bluff" and was ready to fight. Google helped. I'm calm now. I think it's

important to point out that your thread is very human specific, could be applied to placental mammals.



Jennifer Deitloff, PhD @SalamanderJenn · Aug 31, 2018

...

Replies to @SalamanderJenn and @ScienceVet2

However, biological sex refers to size of gametes (big=egg=individual who produces it is female; small=sperm=male) but many indiv can produce no viable gametes, some can produce both, so even this definition is problematic. If we get outside of animals, it's even more so.

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Show replies



Some accounts you follow often like this Tweeter



Sarah @politicat142 · Aug 31, 2018

...

Replies to @ScienceVet2

Victorian gender colors alone gets you a follow.

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Space Enthusiast @hendric · Aug 31, 2018

...

Replies to @ScienceVet2

Man, this is an excellent explanation. Thanks so much. I assume this also applies to all sexual systems in general? Birds, reptiles, insects, etc? Really wish they would have explained how all these systems are not XY back in my biology class!

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Lauren Hunchar @laurenhunchar · Aug 31, 2018

...

Replies to @hendric

(I found this scrolling the comments! Thought you might appreciate it)
[twitter.com/oh_pestilence/...](https://twitter.com/oh_pestilence/)

You're unable to view this Tweet because this account owner limits who can view their Tweets. Learn more

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[Show replies](#)**bonabopn** @bonabopn · Aug 31, 2018

...

Replying to @ScienceVet2

this is a very interesting thread! i am a bit confused however, what is the difference between 'sex' and 'gender'? i have heard people say they're not the same, but no-one's ever explained to me how.

**Andrew Wyld** @Andrew_Wyld · Aug 31, 2018

...

Replying to @ScienceVet2

This is really interesting! Also interesting that it seems to fit on a single dimension, despite the high dimensionality of inputs. Is there any indication/possibility of higher dimensionality?



1

**Hoshigitsune** 🌟🦊 @Fox_Galewarden · Oct 22, 2018

...

Replying to @Andrew_Wyld and @ScienceVet2

Based on some info in the thread (e.g. classifying some scenarios as Male2, Female2, Intersex1, etc.), it seems that even the more descriptive model somewhat arbitrarily shoves these different dimensions into this one dimension of "sex". It would probably...



1

[Show replies](#)**Dr. Russ Taylor** @RussTaylorPhD · Aug 31, 2018

...

Replying to @ScienceVet2

[Unroll @threadreaderapp](#)

1

**Thread Reader App** 🐾 @threadreaderapp · Aug 31, 2018

...

Replying to @RussTaylorPhD

Haloo please find the unroll here: Thread by [@ScienceVet2](#): "So. Hi new people! Apparently, we're gonna talk about sex. Like physical sex! Because... there's some confusion. First, [...]"

threadreaderapp.com/thread/1035246...

ScienceVet
@ScienceVet2

Thread reader

So. Hi new people! Apparently, we're gonna talk about sex. Like physical sex! Because... there's some confusion. First, sex defined: We're talking physical sex here, not gender. Body parts, hormones, and genetics (and more). BLUF: BIOLOGICAL sex is a spectrum 1/ Ok, everyone's su...

[Read Unrolled Thread](#)[Tweet](#)[Share](#)

threadreaderapp.com

Thread by @ScienceVet2 on Thread Reader App

@ScienceVet2: So. Hi new people! Apparently, we're gonna talk about sex. Like physical sex! Because... there's some confusion. First, sex ...

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Nerketur Kamachi @Nerketur · Aug 31, 2018

...

Replying to @ScienceVet2

So let's say we agree with your facts on physical sex.

Now let's say we see someone we believe is female. They look it, talk it, breathe it, etc. But they say they prefer Male pronouns and assume the worst of you for saying "female". Let's even say they are biologically Male.

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Nerketur Kamachi @Nerketur · Aug 31, 2018

...

Replying to @Nerketur and @ScienceVet2

Ignoring the rudeness aspect, and taking into account purposefully mislabeling to harm is definitely bad... the reason we put people into two sexes (and still do) is almost solely based on looks. Not gender, not pronouns, just looks.

And honestly that's all it should be.

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This Tweet was deleted by the Tweet author. Learn more



ScienceVet @ScienceVet2 · Sep 2, 2018

...

Replying to @cosmic_hiccup

It's very important to teach that models are, by definition, imprecise, and will change! Very useful, and you always want to check your data first, but sometimes it's the model that's flawed!

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Daniel Arancibia @ArancibiaDM · Aug 31, 2018

...

Replying to @ScienceVet2

Great thread about thinking of sex as a spectrum, though it must be noted the same could be said of virtually all complex biological phenomena.

Arbitrary simplification can be useful, nonetheless.

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Alberto Bellocchi @A_Bellocchi · Aug 31, 2018

...

Replying to @ScienceVet2

I think where challenges lie is in the meaning of 'normal distribution' in the scientific sense, and the social/lay meaning of 'normal' in everyday life.

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Alberto Bellocchi @A_Bellocchi · Aug 31, 2018

...

Replying to @A_Bellocchi and @ScienceVet2

There's also some confusion here amongst different commentators who draw on statistical distributions and significance to rationalise what is important or unimportant. Statistics do not define reality. If something happens once, represents 0.1% of cases, it is still real.

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Diana Pomeroy-Author and Artist (sh... @Warriorfe... · Aug 31, 2018

...

Replying to @ScienceVet2

Hi! I have MRKH type II and I don't fit in the typical distribution! I am XX and have one functional ovary and kidney...I was born without a vagina,

cervix and uterus and have a neovagina. I don't know anyone online or off
 with my exact condition...and I consider myself intersex 



Elwin @star_brow · Nov 10, 2018

...

Replying to @Warriorfeather and @ScienceVet2

Hi lara! I'm also MRKH type II, with one kidney (not sure about ovaries). I was born without a vagina or cervix but I have a very small malformed uterus that was discovered only by laparoscopy. I have never had any treatment (no neovagina). I also consider myself intersex.

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Backdoor Pharmacist @backdoor_pharma · Aug 31, 2018

...

Replying to @ScienceVet2

Thank you for this thread. Here's an example of a XY woman with kids.
 Important: the study authors note that genotyping is not common, XX males and XY females may be far more common but we just aren't looking for them.



Backdoor Pharmacist @backdoor_pharma · Jul 17, 2018

Fertility reported in a 46,XY female with 2 unassisted pregnancies and a family history of ambiguous sexual development with all typical sex determination genes normal ncbi.nlm.nih.gov/pmc/articles/P...

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77



Meta Heda @Meta_Heda · Aug 31, 2018

...

Replying to @ScienceVet2

I really don't get your point...by your logic everything biological can be described as being on a spectrum because there are always exceptions, but it doesn't mean there aren't norms. In this case the norms are XX=female and XY=male.

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29



Ruth @cincsem · Dec 20, 2019

...

Replying to @Meta_Heda and @ScienceVet2

Yes, but if you get someone who isn't one of those averages (1 in 50 peeps) d'you ask for proof or d'you just go along with what they say they are? D'you need to gender them while you're working together anyway? I mean, why tell someone you know their biology better than they do?

 2 19**Tyler White** @TylerWhiteCogSc · Aug 31, 2018

...

Replies to @ScienceVet2 and @JCSkewesDK

This is really interesting and everyone should be taught this.

 1 10**Crickets** @LoveNotGreed · Sep 1, 2018

...

Replies to @ScienceVet2

Dear Australian Christian Lobby [@ACLobby](#) thought you might want to learn some stuff about how God really makes people in his image...cos there is no single image.... cheers. 2 12**Ishan Raval** @I_are · Aug 31, 2018

...

Replies to @ScienceVet2

@sentientist been following your stuff, inc. about sex differences, for a while, and wondering whether you came across this pretty popular thread and where precisely (I don't think "whether" is apposite with this) you think it goes awry.

 1 4**Diana S. Fleischman** @sentientist · Aug 31, 2018

...

Replies to @I_are and @ScienceVet2

I have a certain admiration for someone to obfuscate simple issues with so much verve. XY can have a uterus but can't make eggs. Makes large gametes = female. I think "spectrum" is a stretch when 99% of the population falls into one of two neat categories.

 10 6 176

Show replies

<https://med-mastodon.com/@spinster> @spinster13 · Aug 31, 2018

...

Replies to @ScienceVet2

Can we just add a box to check that says, "My labs will most likely come back abnormal"? Or "My labs are usually in range"?

That's all I care.



1



...

**Based on your feedback** @NajeyRifai · Dec 29, 2018

Replying to @spinster13 and @ScienceVet2

Well, why? Why oversimplify complex subjects?



1



...

**Christian Holm Diget** 🇺🇦 @dotnetnerd · Sep 1, 2018

Replying to @ScienceVet2

I'll give you two of my favorite quotes. "If you can't explain it simply, you don't understand it well enough". Elbert Einstein. "What traditionally defines a woman falls between two things: her legs". From the movie Dogma



1



...

**Based on your feedback** @NajeyRifai · Dec 29, 2018

Replying to @dotnetnerd and @ScienceVet2

Quotes aren't citations! Not only is this a very complex subject that totally warrants a complex explanation, but he actually DID explain it simply. On top of that, he's a published and qualified endocrinologist, so I think he understands it more than you!



1



...

[Show replies](#)**Lt Col W Kilgore** 🇬🇧 🇺🇦 @NeurolawGuy · Sep 1, 2018

Replying to @ScienceVet2

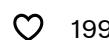
Biological sex for mammals comes in male and female. This is accepted biological fact. You will not find a single article from a reputable academic that suggests anything different.



17



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...

**SylviaFox96** @superdino96 · Sep 14, 2020

Replying to @NeurolawGuy and @ScienceVet2

...

Well this is a challenge to those "facts" and can't be considered true or false until the data is challenged and reexamined by impartial third parties and is either proven or disproven, like the Earth being round and orbiting the sun

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Show replies



Solo Assassin45 @SoloAssassin45 · Sep 1, 2018

...

Replies to @ScienceVet2

all that misinformation just to get muted

From what I hear from scientist I know an trust more than 95% of the population is either male or female, that's not a spectrum

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Tony Sherwood @IWorkInPixels · Sep 8, 2018

...

Replies to @SoloAssassin45 and @ScienceVet2

That would leave 5% of the population existing somewhere other than "male" or "female". If we need to model those individuals, treating sex as a binary won't cut it. We need a spectrum.

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Show replies



Back to basics @afraidofuture · Aug 31, 2018

...

Replies to @ScienceVet2 and @Minervasbard

youtube.com/watch?v=ydrtF4...

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Eric J. Shoemaker @EJShoe · Aug 31, 2018

...

Replies to @ScienceVet2

This thread is very informative. You would think that as far as we have come scientifically as a species, that we could realize we all technically came from the same place. (I am no scientist, so I may need your help clarifying this thought in a second)/1

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Eric J. Shoemaker @EJShoe · Aug 31, 2018

...

Replying to @EJShoe and @ScienceVet2

We all start out with more female than male physiology during gestation correct? It is not until some time after conception that the dna signals the hormones to adjust the female genitalia into male correct? /2

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Show replies



NordicSweetroll @NSweetroll · Sep 1, 2018

...

Replying to @ScienceVet2

See, this is the stuff I needed. I've been against the Spectrum thing, because I couldn't find anywhere, or really anyone who could break it down in a way that made sense to me as a whole. So, I thank you, you've brought a change of opinion that thankfully had some science basis

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Elon musk go fuck yourself @Bubobubosiberi1 · Dec 21, 2019

...

Replying to @NSweetroll and @ScienceVet2

Same here. I knew the "there's only two" argument was bullshit but I had difficulty arguing against it. Because obviously it's more complicated than that... but in what way? This explains it very nicely.

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Torchlight Addict 🇺🇸 ? @KyleRoycePlays · Sep 1, 2018

...

Replying to @ScienceVet2

I just want to say thank you. We need this discussion. We have NEEDED this discussion for a very, very long time.

Thank you. 🙏

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1



THEE #VeryAsian politicalcat #Womens... @thepo... · Dec 21, 2019

...

Replying to @KyleRoycePlays and @ScienceVet2

Suddenly, I feel less conflicted about painting my toenails. Srsly. I got a lot out of this thread, and I'm grateful. AND I'm painting my toenails.



10

**Victor Je Hache** @Victorjehache · Sep 1, 2018

...

Replying to @ScienceVet2

Biological sex is not a spectrum. Next.



2



33

**Nick** @Min4Win · May 11, 2019

...

Replying to @Victorjehache and @ScienceVet2

See I thought it was a bimodal distribution. But your argument was very scientifically convincing. I almost made the mistake of going with the facts before I read about your feelings. Thanks bro!



1



39

[Show replies](#)**Emma Gilbride** 🌟 @ELSRG · Sep 1, 2018

...

Replying to @ScienceVet2 and @adamjury

The people who need to read this most, the fundamentalists, Jewish, Christian, & Muslim, probably won't. People like Jack Phillips of Masterpiece Bakery in Colorado. His newest disservice was to a trans person because God made us male and female only.



1



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**Ursula Hornet SLAVA UKRAINII** @constellabear · Dec 9, 2018

...

Replying to @ELSRG @ScienceVet2 and @adamjury

Pretty sure God would've just handwaved that shit away bc like honestly, what's an all-powerful being care what mortals like do sexually tbh



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**christa teston** @christateston · Sep 2, 2018

...

Replying to @ScienceVet2 and @lecagle

Great thread. (Cf. Barad's agential cuts)



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7





Realz over Feelz @realationality · Sep 4, 2018

...

Replying to @ScienceVet2

Cool, but while it explains the need of more individualized approach in some medical treatment for around 2% of the population, how does it explain a demisexual cloverkind attack helicopter?



3



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Based on your feedback @NajeyRifai · Dec 29, 2018

...

Replying to @realationality and @ScienceVet2

Because gender identity is tied to sex. And if someone happens to fall outside of those two normal distribution peaks, they might be inclined to identify outside of the gender binary, and what better way to do this than to coin a descriptive term for how you feel?



2



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Show replies



Steeven Gaulin @SteevenGaulin · Sep 6, 2018

...

Replying to @ScienceVet2

Still, it's a spectrum between two things. I don't see a third sex or infinite sexes because of the androgynous gradient.



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4



Children_Relief_aid94 @CAid94 · Sep 9, 2018

...

Replying to @ScienceVet2 and @AsexualPride

Is there someone I can speak to about this?.. I've just been talking to a friend about how I feel and a confusing anger I have inside and our talk went towards me possibly being asexual, I had never heard that word before and I need some help because I'm so frustrated these days



1



Ann @Ann62143014 · Sep 10, 2018

...

Replying to @ScienceVet2

this is an interesting thread , but I fail to see how this proves there are more than 2 sexes in any way . you've listed intersex disorders (which are still

-1- ScienceVet on Twitter- -So. Hi new people- Apparently- we're gonna talk about sex. Like physical sex- Because... there's some confusion.

split between male and female) . does people born with odd numbers of
less mean we aren't bipedal ? ❤ 2 ⏪ ⏫



Ann @Ann62143014 · Sep 10, 2018

...

Replying to @Ann62143014 and @ScienceVet2

should we start teaching in kids books that humans don't have 10 fingers because some are born with more or less ? in evolutionary biology sex is determined by gametes . male or female .



Gloria Bentall @GloriaBentall · Sep 10, 2018

...

Replying to @ScienceVet2

"but 7.4 billion sexes is functionally close for our brains. There's nothing stopping us from binning EVERY INDIVIDUAL into their own bin."

According to this different species don't exist. You cut the slice thin enough and we are all just on the spectrum of "Living Organisms"!



Anthony Wilson @arboviral · Sep 11, 2018

...

Replying to @ScienceVet2

Great thread! Do you have a link to the 2,3,7,8-Tetrachlorodibenzo-P-dioxin paper(s)?



Brittany McCown @brittanymccown · Sep 12, 2018

...

Replying to @ScienceVet2

@alissamedero check out this thread!



Ferlie @Ferlie · Sep 17, 2018

...

Replying to @ScienceVet2

Thank you so much for this thread! I was having a long and frustrating discussion with a person and not making much progress. Maybe this will help. It sure educated me! Mmm... education...





YTAddict2000 @YAddict2000 · Sep 23, 2018

...

Replying to @ScienceVet2

Intersex doesn't exist, we aren't fish species that magically change sex, it will literally kill you if you have both male and female genitalia.



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Alana Sennett @AlanaSennett · Sep 25, 2018

...

Replying to @ScienceVet2

Sciencevet Can you please tell us what your name is so that we can up your research?



ccyy @ccyy53136372 · Sep 25, 2018

...

Replying to @ScienceVet2

What's The Difference Between Natural and Artificial? Trying to find FACT to support new education policy with gender-fluid theory, but realized many doctors/scientists are right. SOGI education is so artificial that may do harm to many children and affect kids' natural brains.

By DEBRA W. SOH
12:00AM APRIL 22, 2017

FEATURES

New gender theories sound good but are at odds with the science

In the world of radical identity politics, two groups with different philosophies have been ignoring science in the name of advancing equality: gender feminists and transgender activists.

What Can SOGI-Inclusive Education Look Like?	
Primary	Family diversity Same-sex families Using 'gender' appropriately LGB people, history, human rights
Intermediate	Sexuality as physical/emotional attraction Discrimination Contributions Artistic expression
Secondary	Political Legal Literature
Sexual Orientation (SO)	Gender stereotypes Gender is in your head People feel gender after Gender as a spectrum Trans people, history, human rights
Gender Identity (GI)	Discrimination Contributions Artistic expression Political Legal Literature

SOGIeducation.org #sogil23





Isaac, Dammit @isaacdadammit · Sep 26, 2018

...

Replying to @ScienceVet2

Hi! I would like to use this for a presentation on Sex & Gender. How can I cite you? Biologist? Doctor? Other accolades or titles?



Abby @abbylmay · Oct 9, 2018

...

Replying to @ScienceVet2

@connorrulezd00d this thread is a good start! Conservative estimates (I think) are that about 1 in every 100 babies born is intersex - word for humans with sex characteristics/genes that don't fall cleanly in either M/F category.



Rèmí Èníkànéènógbón @Remmymoses · Oct 13, 2018

...

Replying to @ScienceVet2

Let me digress a bit; SEX ORGANS doesn't always determine SEXUAL ORIENTATION bcos humans with either/both sex organs can be influenced/taught to embrace any sexuality @ any point in life irrespective of hormones,genes,etc. LGBTQPNB* movement is mainly about the sexual orientation



Mama Teal Rose 🇦🇺 #Louie #OT5 ... @MamaTea... · Jan 26, 2021

...

Replying to @Remmymoses and @ScienceVet2

If people could be taught or influenced to have a particular sexual orientation, there would be no gay people. But there are gay people, therefore sexual orientation is innate.



Metaburbia @metaburbia · Oct 20, 2018

...

Replying to @ScienceVet2

in precisely the sense that the number of legs is a spectrum



-1- ScienceVet on Twitter - So. Hi new people- Apparently- we're gonna talk about sex. Like physical sex- Because... there's some confusion.



Louisa @LouisatheLast · Aug 31, 2018

Why does it always come down to invalidating infertile women, in the end?

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200

↑

...



Max Filipsson @mfilipsson11 · Aug 30, 2018

...

Replying to @Skepticat_UK and @ScienceVet2

Because "weird things happen" is how we learn more about the world.
Ourselves included.

Their point is that science doesn't seem to agree that there are two sexes.
That tells us something about who we are.

11

13

607

↓

↑



Lucina wants water @AtelierLucina · Aug 30, 2018

...

Replying to @ScienceVet2

Goals

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2

231

↓

↑



heckacentipede @heckacentipede · Aug 30, 2018

...

Replying to @AndresTructor and @ScienceVet2

To define people based on this kind of overlooks infertile people, which
feels awkward and makes this less of a helpful classification oAo

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287

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Jennifer Bene | I'm not good at tweet... @jbeneauth... · Aug 31, 2018

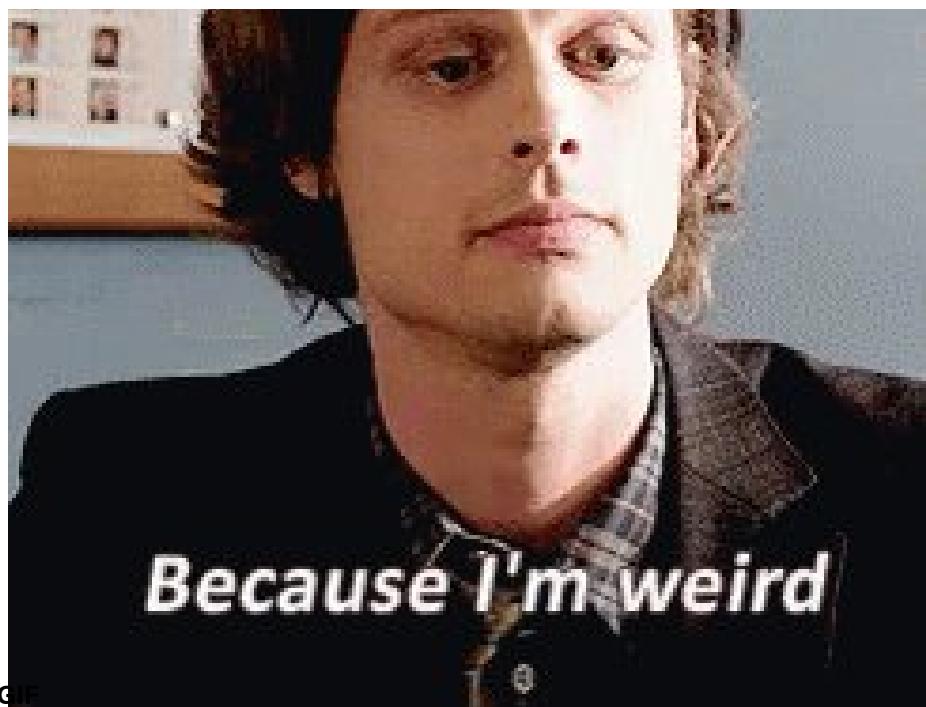
...

Replying to @Chican3ry @AndresTructor and 3 others

A) I like this thread

b) Now all I can imagine is that in this alt universe if a fertile "female" goes
into menopause there's some kind of weird "male"ing ceremony where a
booming voice says "Welcome to maleness!" or everyone sings "Happy
male-day to you!" & (s)he gets presents?





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59

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↑



Melanie vaxxed, boosted, and wearing a ... @seem... · Aug 31, 2018 · ...

Replying to @_pexl @camilleloftus and 2 others

Same. Majored in English Lit, graduated 36 years ago, followed this. At 6:45 AM. Before coffee.

3

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294

↓

↑



Jennifer Bene | I'm not good at tweet... @jbeneauth... · Aug 31, 2018 · ...

Replying to @AndresTructor @Chican3ry and 3 others

Completely ridiculous! Without a LOT of medical intervention I wouldn't have my kiddo and I was born with all the "female" stuff in all the appropriate places. Mine just came with PCOS, which could be one of these intersex variations since I'm high in testosterone!

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28

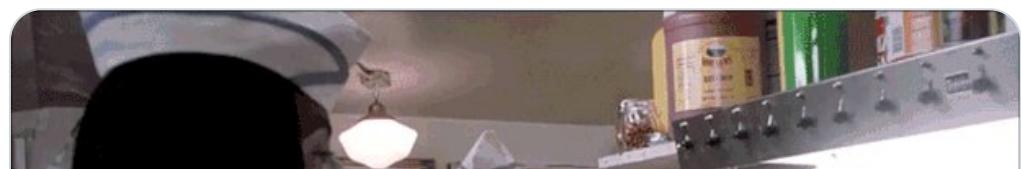
↓

↑



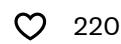
Yami #BLM @YamiNoSenshi · Aug 31, 2018

Replying to @ScienceVet2 and @ahugheswriter



11/15/22, 7:19 PM

-1- ScienceVet on Twitter- -So. Hi new people- Apparently- we-re gonna talk about sex. Like physical sex- Because... there-s some confusion.



Your Gay Aunt Nonah @nonahcagney · Aug 31, 2018

...

I'm cool with having the simile disproven but you can't just say 'nah' what's your argument?



Dr Sofia Axelrod @Baby_Sleep · Aug 31, 2018

...

That's why you're a medical doctor and not a scientist. The whole point of science is to push forward, discover new things, that hopefully, eventually, and with the help of doctors who get it, changes medicine.

