

Transgender People and “Biological Sex” Myths

By Julia Serano July 17, 2017 <https://medium.com/>

I recently penned an essay entitled [Debunking “Trans Women Are Not Women” Arguments](#) in the hopes that it would be a useful primer for countering such claims. But sometimes, efforts to undermine or exclude trans women rely on a somewhat different tactic which takes the following form: A case will be made that [sex](#) is distinct from [gender](#)—the former being purely biological in nature, the latter being entirely social. Upon making this claim, it will then be argued that, while trans women may indeed be women (because “woman” is a gender category), we nevertheless remain “biologically male” (a sex category). This line of reasoning is often accompanied by claims that women are oppressed because of their sex (not gender), and therefore feminism should be exclusively for “biological females” (thereby expunging trans women).

While this is not a new argument, it has garnered increased attention after [Laci Green](#) (a popular YouTube personality) recently forwarded it in a series of videos and comments. Since social media is actively reacting to Green’s comments and similar claims made by others, I thought that this would be an opportune time to debunk this “trans women are biological males” argument, as well as misconceptions about “biological sex” more generally.

Before I begin, I should mention that I am writing this piece, not only as a trans woman and feminist, but also as a [biologist](#). Many of the points that I make here were argued more thoroughly in my books [Whipping Girl](#) and [Excluded](#).

Sex is multifaceted, variable, and somewhat malleable

The primary assumption driving most “biological sex” myths is that there are two discrete mutually exclusive sexes that are immutable (i.e., once born into a sex, you will always be a member of that sex). While there are a number of sexually dimorphic traits—such as chromosomes, gonads, external genitals, other reproductive organs, ratio of sex hormones, and secondary sex characteristics—many times these traits do not all align (i.e., all male, or all female) within the same person, as is the case for [intersex](#) and many [transgender](#) people.

Also, for each of these different sexually dimorphic traits, some people’s anatomies will fall “in between” or “outside of” what most people consider to be standard for female or male.

So in other words, the term “sex” is neither simple nor straightforward: It refers to a collection of sexually dimorphic traits that are variable both across traits and within each

trait. And this is not merely a “trans perspective” on the matter; here is an [article from Nature](#) (one of the most respected science journals) arguing that, “The idea of two sexes is simplistic. Biologists now think there is a wider spectrum than that.”

In addition to this natural diversity, sex is not entirely immutable. Sure, we may not be able to change our genetic sex (which for most of us remains “yet to be determined,” as relatively few people ever have their chromosomes examined, and some who do receive [unexpected results](#)). But reproductive organs may be removed or reconfigured via surgery. And sex hormones can be administered (as they often are for both transgender and [cisgender](#) people), and they may alter our secondary sex characteristics—i.e., sexually dimorphic traits that arise during puberty, such as breast development in females, and facial hair growth in males.

People tend to harbor [essentialist](#) beliefs about sex—that is, they presume that each sex category has an underlying “essence” that makes them what they are. This is what leads people to assume that trans women remain “biologically male” despite the fact that many of our sex characteristics are now female. However, there is no “essence” underlying sex; it is simply a collection of sexually dimorphic traits. Some people will presume that sex chromosomes must be this “essence,” even though we cannot readily see them, plus there are non-XX or XY variants. Others presume that genitals are this “essence” (probably because they are used to determine our birth-assigned and legal sex), although they can vary too, and may eventually change (e.g., if one undergoes [sex reassignment surgery](#)). In day-to-day life, we primarily rely on secondary sex characteristics to determine (or more precisely, presume) what sex a person is—and of course, these traits may change via a simple hormone prescription. Like I said, there is no mystical “essence” underlying sex.

Sex is a collection of traits that, while generally dimorphic, can vary greatly in the population, and some can change over time. While the terms “male” and “female” have some utility, we should not view them as strictly dichotomous or mutually exclusive. Rather, “female” and “male” are best thought of as umbrella terms that describe groupings of people (or animals) who generally share many of the same traits, albeit with considerable variability and some exceptions.

The “mind/body” dualism fallacy

The gender/sex distinction is rooted in [mind/body dualism](#), which was once commonly accepted, but has since been rejected by contemporary biologists, cognitive scientists, philosophers, and psychologists (as well as many feminists!).

For the mind (which, in the case of trans women, would include our gender identities and lived experiences moving through the world as women) to be entirely separate from one’s body, the following two things must both be true: 1) our brains must be completely “un-sexed,” and 2) our social gender should not at all impact or influence our biology.

Point #1 (that our brains are completely “un-sexed”) is false. For starters, every single nerve cell in our brains has sex hormone receptors, which turn genes on or off in response to sex hormones such as testosterone or estrogen. None of us can say precisely what effects these hormones elicit in our brains—there is obviously a lot of gender diversity among human beings, so it is likely a spectrum of outcomes rather than a binary all-or-none response. But the one thing that we *can* say is that the notion that our brains remain completely untouched by “sex” is untrue.

More controversially, there is some evidence to suggest that our gender identities are influenced by biology. For those interested, here are some references from my book [Whipping Girl](#) that discuss this:

- 1 Carina Dennis, “The Most Important Sexual Organ,” *Nature* 427, no. 6973 (2004), 390–392; Arthur P. Arnold, “Sex Chromosomes and Brain Gender,” *Nature Reviews: Neuroscience* 5 (2004), 1–8; Anne Vitale, “Notes on Gender Role Transition: Rethinking the Gender Identity Disorder Terminology in the *Diagnostic and Statistical Manual of Mental Disorders IV*,” from a paper presented at the 2005 HBGDA Conference, April 7, 2005 (a fully referenced version of the paper can be found at www.avitale.com/hbigdataalkplus2005.htm).
- 2 John Colapinto, *As Nature Made Him: The Boy Who Was Raised as a Girl* (New York: HarperCollins, 2000); William G. Reiner and John P. Gearhart, “Discordant Sexual Identity in Some Genetic Males with Cloacal Exstrophy Assigned to Female Sex at Birth,” *New England Journal of Medicine* 350, no. 4 (2004), 333–341.
- 3 Jiang-Ning Zhou, Michel A. Hofman, Louis J. G. Gooren, and Dick F. Swaab, “A Sex Difference in the Human Brain and Its Relation to Transsexuality,” *Nature* 378 (1995), 68–70; Frank P. M. Kruijver, Jiang-Ning Zhou, Chris W. Pool, Michel A. Hofman, Louis J. G. Gooren, and Dick F. Swaab, “Male-to-Female Transsexuals Have Female Neuron Numbers in a Limbic Nucleus,” *Journal of Clinical Endocrinology and Metabolism* 85, no. 5 (2005), 2034–2041.

pp. 369–370 from Julia Serano, “[Whipping Girl: A Transsexual Woman on Sexism and the Scapegoating of Femininity](#)”

This evidence includes the findings that a few microscopic regions of the brain display sexual dimorphism, and that, in these regions, trans women’s brains appear more female-typical than male-typical. Even more persuasive is the fact that a majority of genetically male children who have been (without their knowledge) raised from birth as girls because they did not have a penis (due to botched circumcision, or the non-intersex condition cloacal exstrophy) eventually come to identify as boys and men, despite their gender socialization to the contrary. These examples demonstrate that biological sex can influence gender (thereby disproving point #1).

[a necessary aside: I can imagine the “trans women are biological males” camp responding, “But if there is such a thing as intrinsic ‘brain sex,’ then Julia, your brain must be male!” To which I respond: I by no means claim that this supposed “brain sex” wholly determines our gender, just that it seems to have an influence upon it.

Furthermore, if some kind of “brain sex” does exist, then we should expect it to vary quite a bit within each sex and between sexes, just as all of the other sexually dimorphic traits that I mentioned earlier (e.g., chromosomes, reproductive organs, sex hormones, secondary sex characteristics, etc.) do. If this is true, then trans people may be examples of this variation.]

Point #2 (that our social gender should not at all impact or influence our biology) is also untrue. Our brains physically change in response to our experiences. Here is a list of references from my book [Excluded](#) detailing this:

21. S. Marc Breedlove, “Sex on the Brain,” *Nature* 389 (1997), 801; Bogdan Draganski, Christian Gaser, Volker Busch, Gerhard Schuierer, Ulrich Bogdahn, and Arne May, “Changes in Grey Matter Induced by Training,” *Nature* 427 (2004), 311-312; Stefan Klöppel, Jean-Francois Mangin, Anna Vongersichten, Richard S. J. Frackowiak, and Hartwig R. Siebner, “Nurture versus Nature: Long-Term Impact of Forced Right-Handedness on Structure of Pericentral Cortex and Basal Ganglia,” *The Journal of Neuroscience* 30, no. 9 (2010), 3271-3275; Eleanor A. Maguire, David G. Gadian, Ingrid S. Johnsrude, Catriona D. Good, John Ashburner, Richard S. J. Frackowiak, and Christopher D. Frith, “Navigation-related structural change in the hippocampi of taxi-drivers,” *Proceedings of the National Academy of Sciences* 97 (2000), 4398-4403; Thomas F. Münte, Eckart Altenmüller, and Lutz Jäncke, “The musician’s brain as a model of neuroplasticity,” *Nature Reviews in Neuroscience* 3 (2002), 473-478; Denise C. Park and Chih-Mao Huang, “Culture Wires the Brain: A Cognitive Neuroscience Perspective,” *Perspectives on Psychological Science* 5, no. 4 (2010), 391-400; Katherine Woollett, Eleanor A. Maguire, “Acquiring ‘the Knowledge’ of London’s Layout Drives Structural Brain Changes,” *Current Biology* 21, no. 24 (2011), 2109-2114.

p. 314 from Julia Serano, “[Excluded: Making Feminist and Queer Movements More Inclusive](#)”

Therefore, my seventeen years of experiences identifying as a woman, being perceived and treated as a woman, and experiencing sexism as a woman, have undoubtedly shaped my brain to some degree. So the notion that my gender does not influence my biology (i.e., point #2) is incorrect, thereby disproving the assumption that mind and body (and by correlation, gender and sex) are entirely separable entities.

[a secondary aside: I can imagine the “trans women are biological males” camp responding, “If our experiences physically alter our brains, then Julia, your socialization as a boy must disqualify you from being a woman!” To which I would respond: 1) by reverting back to gender just then, you have contradicted your own argument, and 2) I suggest that you read my [previous essay](#), particularly the sections on socialization and “kitchen sink” arguments.]

The “nature versus nurture” fallacy

Both the body/mind and sex/gender distinctions are related to “nature versus nurture” debates, wherein people will point to some human trait (e.g., intelligence, personality, or in this case, gender) and argue that the outcome is entirely due to biology/genetics or entirely due to environment/socialization.

While some biologists in the past have forwarded strict “nature” arguments, contemporary biologists acknowledge that most (if not all) human traits arise due to complex interactions between numerous biological factors (both shared biology and individual biological differences) and environment (both shared culture and individual experiences) to create a broad spectrum of outcomes. In [Excluded](#) (specifically Chapter 13, “Homogenizing Versus Holistic Views of Gender and Sexuality”), I make this same case with regards to sex and gender.

Clarifying the “sex is a social construct” argument

Sometimes people who are trying to debunk “biological sex” myths will point out that sex (like gender) is a social construct. The reason for doing this is to show that the “biological versus social” distinction is far more muddled (as I have detailed in the last two sections) than the “trans women are biological males” camp is willing to admit.

Unfortunately, people who are unaware of, or misinformed about, [social constructivism](#) will often mistake the word “constructed” to mean “fake” or “not real,” and thus assume that such claims represent a denial of the existence of sexually dimorphic traits. However, this is not what the word “constructed” means.

Saying that sex is “socially constructed” does not mean that biological sex differences do not exist or do not matter. It simply conveys that our definition of sex, and the way that we categorize people into sexes, is determined by society and our assumptions about how the world works.

In our society, people are assigned a legal sex at birth based on the presence or absence of a penis—that is a social process. When people argue that it must be chromosomes, or a particular reproductive organ, that defines or determines a person’s sex, that is a social decision—one that ignores the multiplicity and variability of sexually dimorphic traits. Indeed, the very fact that, given the same evidence, people will disagree about the nature of sex (strictly binary versus multifaceted and variable; immutable versus somewhat malleable) demonstrates that sex is socially constructed!

So in other words, we can say that biological sex differences exist, and also that our understanding of sex is socially constructed—these are not contradictory statements at all.

Women are oppressed because of both sex and gender

While I disagree with claims that “trans women are biological males,” at least I can understand where they come from: Many people harbor binary and essentialist beliefs about sex, so it’s not surprising that they might come to this false conclusion. However,

the notion that “women are oppressed because of their sex, not their gender” is downright ludicrous.

While the sex/gender distinction may serve a purpose in more nuanced or theoretical discussions on the subject, in everyday life most people do not make this distinction. That is, most people use the terms “sex” and “gender” synonymously. Whenever a man speaks over me or down to me, he’s not thinking: “Well, this person appears to me to be biologically female, as opposed to merely identifying as a woman, so therefore I will be misogynistic toward her.” Rather, he simply sees a woman/female (same thing in his eyes), and treats me accordingly.

While it is true that some forms of sexism specifically target female biology (e.g., slurs for breasts and vaginas, attempts to regulate women’s reproductive systems), many other expressions of sexism target traits that fall under the realm of gender (e.g., accusations that women are not mentally or constitutionally fit for leadership positions, comments deriding feminine gender expression, etc.).

Additionally, trans women do experience many forms of sexism that target female biology—in my case, I have experienced slurs targeting my female body parts, sexual harassment, attempted date rape, men ogling and objectifying my body, and so on.

Clearly, “women are oppressed because of their sex, not their gender” is not a serious proposition, nor is it a legitimate feminist concern—it’s merely a bold-faced attempt to exclude trans women. Feminism is a movement to end sexism. Trans women face sexism. Ergo, trans women have a stake in feminism.

The myth that trans people are trying to deny or erase “biological sex” differences

The most infuriating assertion regularly made by the “trans women are biologically male” camp is that trans people are somehow “denying” or “erasing” biological sex differences, and that this hurts cisgender women/“biological females.” This is patently untrue. I can assure you that trans people are highly aware of biological sex differences—the fact that many of us physically transition demonstrates that we acknowledge that sexually dimorphic traits exist and may be important to some people!

I would reframe things this way: Transgender people often have a more complicated relationship with our sex-related traits (as they may be discordant with our identified and lived genders), and thus the language that we use to describe or discuss these traits may seem arcane, or nonsensical, or unnecessary to the average cisgender person. And because they are unfamiliar with this language (and/or flat-out antagonistic toward us), some cisgender people will subsequently misinterpret this language and differing perspective as some sort of “denial.”

While writing about this, I couldn't help but think back to a patient intake form that I once had to fill out upon visiting a new doctor. The form separated out all the male questions (e.g., when was your last prostate examine) from the female questions (e.g., when was your last breast exam). Multiple items from each sex category applied to me, so I filled out answers in both fields. Honestly, it felt really sucky — not because I'm in denial about my body or my sexual traits, but because the form suggested that who I was should not even be possible.

What I'm trying to convey here is that trans people are not in any way “denying” or “erasing” biological sex differences. We are simply objecting to those who invoke real or imagined biological sex differences in their attempts to exclude us.

Sex and gender are complicated phenomena, and language is imperfect. I personally have no problems with people talking broadly about “female anatomy” or “women's reproductive rights,” so long as they aren't purposely trying to erase transgender and intersex people in the process. And (in contrast to lies peddled by Laci Green, [Elinor Burkett](#), and other cisgender feminists) I (and virtually all other trans people) have absolutely no qualms with women [talking about their vaginas](#) or other body parts, provided that they are not asserting that these sex attributes apply to all women, or denying the fact that some men may possess them as well.

But in my experience, when people go out of their way to use the clunky phrasing “biological male/female,” they are almost always attempting to contend that 1) biology trumps trans people's gender identities and lived experiences, and 2) dismiss the reality of gender and sexual diversity, and the fact that there are exceptions to every sex and gender category. If this is your intention, then you should know that I am not “denying” or “erasing” sex differences. I am simply pointing out that you are uninformed about these matters and/or an outright bigot.