

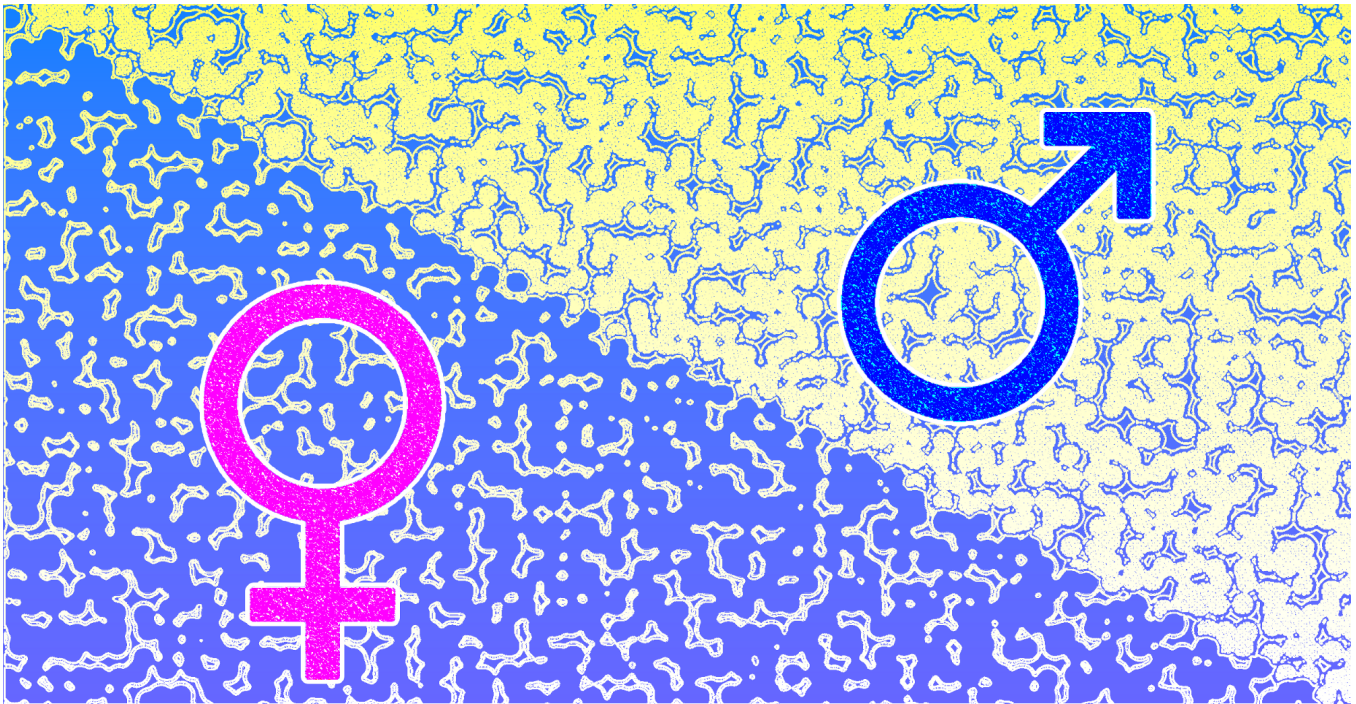
# Is Sex Binary?

The answer offered in a recent New York Times opinion piece is more confusing than enlightening



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In her *New York Times* op-ed “Why Sex Is Not Binary,” the biologist and gender studies theorist Anne Fausto-Sterling tries to set the record straight: “Two sexes have never been enough to describe human variety.” According to Fausto-Sterling, it has “long been known” that some people are neither female nor male (or, perhaps, *both* female and male).

Fausto-Sterling is responding to a leaked draft memo from the Department of Health and Human Services that proposes a legal definition of sex under Title IX “based on immutable biological traits.” The memo appears to be part of a regrettable attempt to remove some legal protections from people who are transgender. Although a transgender person is no less likely to be female or male than someone who is not transgender, activists for

transgender rights often cite the alleged fact that “sex is not binary” to support the idea that being transgender is not a mental health condition, but instead is merely “normal biological variation.” That “sex is a spectrum,” or — as Fausto-Sterling wrote in *The New York Times* 25 years ago — that “there are at least five sexes,” are claims that are pressed into similar service. Fausto-Sterling’s article endorses and reinforces these ideas. But not only are the claimed biological facts far from established, this particular use of biology to guide social and legal issues is completely misguided in the first place. Transgender people, just like anyone else, should be free to live and work without being stigmatized, harassed, or disrespected. Whether sex is binary, a spectrum, or whether there are 42 sexes, makes absolutely no difference.

Let’s start with the biology. Fausto-Sterling’s approach to whether some people are neither female nor male is rather indirect. She explains the psychologist John Money’s many-fold distinction between chromosomal sex, external genital sex, pubertal hormonal sex, and others. She points out that these do not always align. For instance, there are people who are chromosomally male (XY) but whose external genitalia are female. Fausto-Sterling also notes that Money’s “layers of sex” are not themselves binary: there are sex-chromosome combinations other than XX and XY, and similarly for the other layers.

But where are the original categories of *female* and *male*, supposedly the topic of Fausto-Sterling’s article? They seem to have disappeared, being replaced by *chromosomally-female*, *genitally-female*, and so on. Granted, there are some people who have XXY chromosomes, or just a single X, making them neither chromosomally female nor chromosomally male. But the question was not whether *chromosomal* sex is binary, it was whether *sex* is binary. That question has been evaded, not answered.

The categories of *female* and *male* are in fact implicit in Money’s taxonomy. To be chromosomally female is to have the sex chromosomes typical of (human) females; to be genitally female is to have the genitalia typical of (human) females, and so on. But what is it to be, simply, female or male? Forget Money’s many sex-related categories — what are the sexes?

The answer has been known since the 19th century. As Simone de Beauvoir puts it in *The Second Sex* (the founding text of modern feminism), the sexes “are basically defined by the gametes they produce.” Specifically, females

produce large gametes (reproductive cells), and males produce small ones. (Since there are no species with a third intermediate gamete size, there are only two sexes.<sup>1</sup>) A glance at the huge variety of females and males across the animal and vegetable kingdoms will confirm that there is nothing else the sexes can be. For instance, the equation *female*=XX is confused for a fundamental reason having nothing to do with human chromosomal variation: females of numerous species either have different sex chromosomes (as in birds) or else no sex chromosomes at all (as in some reptiles). The XX/XY system is merely the mechanism by which placental mammals like humans typically *become* female and male; other animals and plants use different means to achieve the same end result. Whenever it is suggested that being female or male is a matter of having certain chromosomes (or primary/secondary sex characteristics), that is a sure sign that the discussion has gone off the rails.

There is a complication. Females and males might not produce gametes for a variety of reasons. A baby boy is male, despite the fact that sperm production is far in his future (or even if he dies in infancy), and a post-menopausal woman does not cease to be female simply because she no longer produces viable eggs. Female worker honeybees are usually incapable of producing eggs because their ovarian development has been inhibited by chemicals secreted by the queen. (In one species of bee, the female workers are all permanently sterile, even in queenless colonies.)

In the light of these examples, it is more accurate (albeit not completely accurate) to say that females are the ones who have advanced some distance down the developmental pathway that results in the production of large gametes — ovarian differentiation has occurred, at least to some extent. Similarly, males are the ones who have advanced some distance down the developmental pathway that results in the production of small gametes. Definitions in biology are never perfectly precise, and these are no exception. Still, they give us some traction in examining whether there are any humans who are neither female nor male. (It is not in dispute that some non-human organisms are neither female nor male, and that some — hermaphrodites — are both.)

Consider, for example, the “intersex” condition Congenital Adrenal Hyperplasia — one of many “disorders of sex development” (DSDs). XX individuals with this rare condition can have an enlarged clitoris at birth (sometimes very penis-like), due to high levels of androgen hormones in the

womb. They have progressed some considerable way down the developmental pathway that produces eggs (they have the usual ovaries and fallopian tubes), and have not even started down the (male) sperm-producing pathway. They are sometimes assigned male at birth, but are usually raised as girls, and indeed many of them go on to have children. Whether they are raised as girls or boys, the scientific literature correctly classifies them as female. As might expected, there are some other rare cases (arguably 1 in 50,000 births or even rarer) that are hard to decide, but there are no clear and uncontroversial examples of humans who are neither female nor male. (A similar point goes for supposed examples of humans who are both female and male, although here things get more complicated.)

The existence of some unclear cases shows that it would be incautious to announce that sex (in humans) is binary. By the same token, it is equally incautious to announce that it isn't — let alone that this is an established biological fact. And even if some people are outside the binary, they are a miniscule fraction of the population, nothing like the frequently cited 1–2 percent figure, which draws on Fausto-Sterling's earlier work.<sup>2</sup>

That sex is not binary is evidently something that many progressives dearly wish to believe, but a philosophically sound case for treating everyone with dignity and respect has absolutely no need of it. People with intersex conditions have historically been subject to ethically dubious genital surgery as children, or deceived about their medical status by (usually well-meaning) doctors. It would be a huge mistake to think that such surgery is unjustified because the patients fall outside the binary, and so should not be surgically fashioned to appear to be within it. The main arguments against surgery (there are risks with little compensating benefit, and patients are too young to consent) have nothing to do with whether the patients are female, male, both, or neither.

Top highlight

Further, the issue of whether sex is binary, although of academic interest, is of no relevance to current debates about transsexuality and the changing models for treating gender dysphoria. To those struggling with gender identity issues, it might seem liberating and uplifting to be told that biological sex in humans is a glorious rainbow, rather than a square conservatively divided into pink and blue halves. But this feel-good approach is little better than deceiving intersex patients: respect for autonomy demands honesty. And finally, if those advocating for transgender people (or anyone else) rest their case on shaky interpretations

of biology, this will ultimately only give succor to their enemies.

**Notes:**

<sup>1</sup>In this sense, sex is binary: there are only two sexes. However, the interpretation of “sex is binary” relevant to the present debate is different: everyone is either female or male, and no one is both.

<sup>2</sup>The source for the 1–2 percent figure is Fausto-Sterling’s co-authored 2000 paper “How Sexually Dimorphic Are We?”. That paper estimated the “frequency of intersex” at 1.7 percent. A neglected response by the philosopher Carrie Hull corrected “numerous errors and omissions” in the data collection and interpretation, bringing the figure down to 0.37 percent. Importantly, that figure is *not* an estimate of the frequency of “intersex conditions” as usually understood, but rather includes any failure to (in Fausto-Sterling’s words) “conform to a Platonic ideal” of femaleness and maleness. By this over-inclusive criterion, XYY individuals, who are practically indistinguishable from normal XY males, are counted as intersex. The true figure for intersex conditions (understood as those where the phenotype has both female and male elements — a small subset of DSDs) is closer to 0.018 percent, about 100 times lower than the figure supplied by Fausto-Sterling (see Leonard Sax, “How Common Is Intersex? A Response To Anne Fausto-Sterling”). Incorporating Hull’s corrections drops that percentage to 0.015. The present point is that *even people in this 0.015 percent* usually fall within the female/male binary, and that no one clearly falls beyond it. (There actually are more plausible candidates for exceptions to the female/male binary than the classic intersex conditions comprising this 0.015 percent, in particular XY gonadal dysgenesis or Swyer Syndrome.)

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