



Is Intersex a Third Sex?

Those who claim that biological sex is not binary, but rather a spectrum of possibilities, will often use intersex to argue their case. “The idea that the body is either male or female is totally wrong,” says a writer for Teen Vogue, “We know that intersex people exist and breakdown this binary.” \ As someone who has done extensive research in sex and gender, I see this almost every day: I’ll be having a discussion with someone about sex dimorphism, and they’ll respond with confidence: “Have you ever heard of intersex people?” they ask. Of course, the answer is, “Yes! I have,” and this is where the case studies start flying in, / as they tell me that intersex people are not male or female. \ Now, while most males and females develop typical reproductive structures, sometimes variations in this process occur. / We call these variations ‘intersex.’ Intersex individuals have rare differences in sex development which can produce chromosomal, hormonal, or genital variations. To many, such variation shows us that the male-female binary is unreliable, that there are more than two sexes, and that sex is a spectrum. \ But, is this true? Are intersex people really ‘in between’?

The answer depends on how we define biological sex. Before we do, we must separate biological sex (the category) from ONE) variations of sex characteristics and TWO) personal identity.

/ First, let’s separate biological sex from variations of sex characteristics. Variation is commonplace within males and within females (for example, different sizes of sex organs and secondary sex characteristics are common within men and women), and yet this variation does not mean that someone with atypical sex characteristics is less of a male or a female; it simply means sex characteristics vary in their form, size, and morphology. \ For instance, a woman without breasts may fall on the tail end of the distribution when it comes to female sex characteristics, and yet this does not make her less of a woman or more of a man; she still resides in the female category, she still is a female. To say otherwise would be horribly offensive and just plain wrong. / Therefore, variation of sex characteristics does not equal biological sex.

Second, let’s separate biological sex from personal identity (how you see yourself and how you express yourself). Variation of identity and expression is common; in fact, identity and expression are so varied that they are the most diverse set of traits we have as humans (akin to personality).

\ Intersex individuals can identify as anything they wish and express themselves in a spectrum of ways, and we should encourage everyone to live their best lives. And yet, / this colorful diversity of identity and expression does not equal biological sex.

\ So, if neither variation of sex characteristics nor personal identity defines the category of sex, then how can we define it? The answer is simple. The category of biological sex is defined through what developmental pathway you went down for the production of either sperm or eggs--the two, and only two, gamete types. Gamete production is supported through what dominant gonadal tissue you have (testes or ovaries) and their respective reproductive structures (Wolffian or Mullerian). The differentiation and development of both the gonads and reproductive structures are determined through the action of two mechanisms: 1) the function of the SRY gene, and 2) the function of androgen receptors. / While there are multiple pathways for sex differentiation and development, there are only two endpoints: male or female. If you have both a functional SRY gene and functional androgen receptors, you will almost always develop



as a male. On the other hand, if you do not have both of these mechanisms working together (such as an absence of SRY or insensitive androgen receptors), then you will almost always develop as a female. \ In this way, biological sex is determined through a sequential coordination of mutually antagonistic mechanisms which activate the primary sex pathway of development and block the opposite sex pathway. Thus, sex is binary, defined through the two gametes, sperm or egg. There is no third option. To understand this, let's look at how the process works in the womb.

/ In early development, we all start out with two internal reproductive structures that will differentiate and develop based on the SRY gene and androgens. Around the 8th week of gestation, the presence or absence of the SRY gene differentiates the bipotential gonads into either male or female tissue. If SRY is present, the bipotential gonads form into testes. As the testes develop, they release hormones for the development of the male internal reproductive structure (Wolffian). As the male structure develops further and the testes release hormones, the female structure (Mullerian) disintegrates. On the other hand, if SRY is absent, the bipotential gonads form into ovaries. As the ovaries develop, there is no anti-Mullerian hormone present to block female development. Then, the Mullerian structure develops further, and the male structure (Wolffian) disintegrates. Thus, the SRY gene is the on/off switch which determines your gonadal differentiation, and therefore, your biological sex.

So, what about intersex? Well, this is where things get more complicated, but the endpoint of male or female remains the same. Intersex is an umbrella term which represents more than 40+ medical conditions, each with their own specific developmental pathways. Such complexity will be explored later, but for now, all we need to know is that most individuals classified as intersex have typical gonadal differentiation into either testes or ovaries and have typical Wolffian or Mullerian structures, and are therefore, either male or female. \ So, if intersex individuals are males and females, like everyone else, then why are they considered 'in between,' 'ambiguous' or a 'third sex'? The answer is due to a lack of knowledge about intersex.

/ For instance, intersex females can have typical gonadal differentiation but differences in development of their genitalia, such as a fused labia and enlarged clitoris, a condition known as Congenital Adrenal Hyperplasia. And yet, they are still females because they have ovaries, a Mullerian structure, and no SRY gene. Consider another case, where gonadal differentiation AND development are atypical: intersex females who have the SRY gene but lack functional androgen receptors will have remnants of the Mullerian structure and develop female morphology, a condition known as Complete Androgen Insensitivity Syndrome. And yet, even though these individuals have the SRY gene, they lack functional androgen receptors, and the male pathway of development does not proceed. Thus, they are females.

On the other hand, intersex males who have typical gonadal differentiation with differences in reproductive development can sometimes develop breast tissue and have smaller testes (a condition known as Klinefelter's), which results in a duplicate of the X, and yet they are still males because they have testes, a Wolffian structure, the SRY gene, and functional androgen receptors. \ For more complex intersex conditions, a case-specific analysis of their development pathway is needed, a topic for a future video. But even with more complex conditions, the sex of these individuals can still be determined through a combination of genetic, hormonal, and morphological markers. Thus, the actual sex of intersex infants is



not determined through subjective societal criteria or some 'innate' feeling. It's determined through the presence or absence of SRY and functional androgen receptors.

Saying that intersex people are not males or females actually 'others' them, as it reduces them to the mere appearance of their genitals. Imagine telling an intersex girl she's 'not a female' because she has a large clitoris, or an intersex boy he's 'not a male' because he has small testes. Such comments would be not just wrong, but downright evil. And yet, such an offensive practice happens every day, as intersex individuals can attest. / Furthermore, saying that intersex people are 'in between' male and female also conflates their serious development conditions with identity and expression, of which there is no relation. Doctors of the past often surgically mutilated intersex infants specifically because they viewed such infants as 'in between,' and thus, assigned them to the wrong sex.

"Unnecessary surgeries on babies with differences in sex development never happened because doctors didn't know the infants' sex," writes Claire, an intersex woman, "It was because they believed society would never be able to accept their different bodies as the sex they are."

Now, genetic and molecular biology shows us the truth: intersex infants are males or females; not both, and not neither.

\ Intersex individuals, those with real differences in sex development, are hurt, not helped, by conflating their reality with identity and expression. For example, some intersex conditions can be fatal if left untreated by medical professionals, such as the salt-wasting variety of Congenital Adrenal Hyperplasia, which only affects females. This does not mean intersex infants need unnecessary genital surgery, but it *does* mean that their conditions should not be conflated with personal identity. / Or, in the words of Rae, another intersex woman:

"The misinformation that we're neither male nor female is what fosters a culture of intersex genital mutilation. This is because we're not seen as 'normal' when, in actuality, we're simply the expected variation found in a dimorphic system of sex development."

\ Intersex people are males and females, like everyone else. And they are tired of being used as pawns for the so-called 'spectrum of sex.' Sex is not a spectrum, it's a binary, a gene-defined dimorphic system of development which is what allows us to reproduce in the first place. / Variation of sex characteristics are diverse and multidimensional; identity and expression are diverse and multidimensional. But the category of biological sex? It has been and always will be a binary.

\ So, knowing that sex is determined through the presence or absence of SRY and functional androgen receptors, I'll leave you with something to consider: do intersex people have a third reproductive structure? Do they have a third gamete? Are intersex people a third sex? Are they not male or female?

I'm Zach, author of *The Gender Paradox*, for the Paradox Institute.

END.