

WHY AM I TRANSGENDER? CLUES FROM BIOLOGY

A MYSTERY

I have lived my life in the midst of a grand mystery. I was born with female genitals and a completely female reproductive system. All the parts were there. My birth certificate offered no ambiguity. Puberty came along to verify what my physical body was telling me. You, my friend, are a girl. Yes, for all appearances, I was a girl. Then why was I not a girl? I stood in front of the mirror as puberty did its work, and the mirror reflected an out of body experience. Who was that looking back at me? So every morning, I began my day trying to live up to the evidence, to make it work.

It didn't work. I never felt like a girl. Living somewhere inside me was a boy trying to break through. My happiest times were when I let him come out and play. I sometimes thought of myself as two separate people. With puberty and the physical changes, there came the attraction vibrations. All my girl friends were obsessed with boys. Me? I wanted to be a boy, not be with a boy. And I sure didn't want boys kissing or touching me. Talk about a mystery. I was raised in an evangelical family. There was NO language for what I was feeling. Now, the mystery had crossed over to a whole new realm. I loved girls. I wanted to be the boy that the girls loved. Misery followed this realization.

Looking through my mother's big medical terminology book, I found the word that described me, or at least I thought it did. I was a HOMOSEXUAL. I would like to say that it was comforting to finally find a word that fit, but quite the opposite was true. I had heard the word in the context of the Bible and from the mouth of our fire and brimstone preacher, so I knew what this meant. I was damned to hell. Being the good little Christian girl, this would not do. So, I set about to not be a homosexual. Perhaps you are a

heterosexual. It would be like you deciding that starting tomorrow morning, you were going to be a homosexual. Yeah, you wake up tomorrow and you will love someone of the same sex as you. Wonder how that will work out? The same way it worked out for me. Love/attraction is a powerful force. You don't exert will over it and change it. I don't care what blog you read or whom you talk to, this is the way it is.

Needless to say, compromises had to be made. I would still be a girl by appearance, but I would go through life loving women. But the label homosexual always felt incomplete. Something else was going on with me. As I often told my friends, I sucked at being a woman. Seriously, I did. I wore costumes every day at work. I pretended. And the mystery lay unsolved. What/who was I?

I studied psychology, of course. The mystery of human development and behavior captured my interest for obvious reasons. I got a college degree, then a Master's Degree. It was in graduate school that I first heard the term transsexual. Suddenly, there seemed to be some clues about my life. I considered this and even looked into sexual reassignment surgery. There were no encouraging stories about how those surgeries turned out. So, I lived my life as a lesbian.

As research advanced and technology gave us better windows into conception and fetal development, science began to provide some broader explanations about sexual development and gender identity. This is when clues began to emerge about the mystery of my life. Not many of us know much about the biology of sexual development. Yes, it involves chromosomes, genes and lots of other fascinating stuff, but rather than lose you in the terminology, I want to make the steps understandable. I am asking you to take the time to understand this process that makes us who we are. Otherwise, our culture demonizes differences like transgender, intersex and other manifestations of biology that we don't

understand. That simply isn't fair, and it isn't how we want to treat each other. We want to understand. This is fundamental to our human nature. The development of sexual anatomy and the development of gender are two different processes. There is nothing wrong with the way these processes take place. They are what they are. They might cause differences, but these differences are not flaws. They are differences that enrich our world.

IN THE BEGINNING

Conception is a moment in time. A sperm penetrates an egg, and the potential for life begins. When you consider how many sperm make the effort, the success of one is a true miracle. Yet, this miracle has happened over 7 billion times in the world. Within that fertilized egg lays the recipe for a human being. Twenty-three chromosomes from the male and twenty-three chromosomes from the female. In that chain of pairs, we will focus on the twenty-third pair, which contains the determinants of sexual anatomy. If each chromosome matches, XX, the result is a female fetus. If they do not, XY, the intent is the making of a male fetus. But, intent is not everything. Nature sometimes has tricks up its sleeve.

SWITCHES ON, SWITCHES OFF

A chromosome carries an astonishing number of components, for example, genes and DNA. These are blueprints for how development is to proceed. We are talking on a cellular level. So when you look at your computer, you see a box that can make many things happen. A computer is huge in comparison to the genes and DNA that are like computers in your body. Computers use codes that are written by humans to create certain functions. Genes and DNA are nature's codes for how development is to proceed. For example, to form organs, genes switch on that direct

cells to form and grow to create a kidney, a brain, a lung, a heart. Typical development relies on each switch activating and the cells following the directions. Sex determination is one small facet of our development. Yet, like the heart, the lung, the brain, sex determination will have a significant influence on our lives.

THE MAKINGS OF A BOY/GIRL

If we were to treat this chapter as a play, we would begin by introducing the cast of characters. We begin with a lone actor on the stage, and then over time new characters will enter. Let's assume that this play is a mystery, for indeed, it is.

After conception, cell creation begins at rapid-fire speed. Cells form and join to become the building blocks of our organs. Cells form tissue that initially awaits further instruction. What will I be? This is where sexual anatomy begins. In early fetal development, there is no external sexual anatomy visible. At about six weeks, if the fetus has an XY chromosome, then sexual anatomy will begin to form as follows:

The Y chromosome contains the gene that is in charge of making male sexual anatomy.

The SRY Gene (SoRrY, you are a dude)

When the SRY gene turns on, it activates a protein that triggers a series of cell formations. If the SRY gene turns on, these parts develop:

- Male hormone delivery system
- Prostate
- Scrotum
- Testicles

- Sperm
- Penis

A fully functioning male sexual reproductive system is created.
All of this happens between 6 to 14 weeks of development.

If the fetus is XX, a gene or genes trigger different proteins, and these parts develop:

- Female hormone delivery system
- Ovaries
- Fallopian tubes
- Uterus
- Vagina
- Eggs
- Breasts

We have looked at chromosomes, DNA and genes. There is yet another powerful player in the world of gender development: hormones. Circulating through the body are chemical messengers that tell other cells what to do. These messengers help the body respond to internal and external needs. For example, one of the most familiar hormones is adrenalin. The job of adrenalin is to help the body respond to fearful events. Adrenaline helps us flee danger. It gives us energy to respond quickly.

The secretion of hormones is the result of communication between the hypothalamus in the brain and the pituitary gland. For purposes of our discussion about gender, the focus will be on testosterone and estrogen. These are often referred to as the sex hormones. They are both present in the body but vary in proportions based on chromosomal sex determination. Males have more testosterone, while females have more estrogen. The role of these hormones in gender is part of the new frontier in our understanding of gender.

During the fetal development of sexual anatomy, testosterone has a role in the full completion of the sexual reproductive system. The testes in the fetus develop early on. Once that happens, the testes produce testosterone which literally “bathes the fetus” causing the development of the remaining anatomical parts. It is also important to consider the amount of testosterone produced by the mother of the fetus. Her levels delivered through the umbilical cord also influence the completion of anatomy.

Development depends on the secretion of the right hormone in the right amount at the right time to a capable recipient. Let’s consider the many variations that might occur during development.

VARIATIONS IN SEXUAL DEVELOPMENT

As we have seen, there are many variables that affect sexual anatomy and gender. We assume that development proceeds in a single predictable process according to a master plan. Most of the time, it does. However, this is not always the case and here are some of the ways that biological influences can alter the outcome:

Scenario 1: The Y chromosome of the XY pair does not have the SRY gene. It just isn’t there. You have a male child that will not develop sexual reproductive parts. When the baby is born, this baby will look exactly like a female baby. The anatomy does not match the chromosomal intention. As this child develops, they

may very well feel and present as the male gender in spite of sexual anatomy. Imagine how confusing this would be.

Scenario 2: The SRY gene is on the Y chromosome, but the gene does not switch on. Male sexual anatomy does not develop. This infant will appear to be female.

Scenario 3: The SRY gene is on the Y chromosome, but the gene only partially turns on. Only some of the male sexual anatomy develops. You may have a baby born with a vagina and internal anatomy of a male. Or you may have a baby born with ambiguous genitalia that may look like an enlarged clitoris or a very small penis. There is no clear way to determine the nature of the sexual anatomy. How often does this occur? 1 in 1500 to 2000 live births have some type of atypical sexual anatomy. More about this later.

Scenario 4: The SRY gene ends up on one of the X chromosomes in the female fetus. As sexual anatomy develops in weeks 6 to 14, this infant will have the chromosomes of a girl but the sexual anatomy of a boy. This assumes that the SRY gene fully functions. If it only turns on partially, you will have a little girl with some male parts either externally or internally. She may also have ambiguous genitalia.

Scenario 5: The switch that turns on the secretion of testosterone may not work. Therefore, no hormone is secreted. Male sexual anatomy does not develop. The baby that is born has female sexual anatomy.

Scenario 6: The secretion of testosterone does not occur during the time period when sexual anatomy is being formed. No male sexual anatomy forms, and the baby will appear female.

Scenario 7: The amounts of testosterone secreted are not adequate. The sexual anatomy may partially form resulting

in ambiguous genitalia or mixed sexual reproductive organs.

Scenario 8: The fetus does not react to testosterone; in other words, there is no capable recipient. This is a condition referred to as Complete Androgen Insensitivity Syndrome. No matter how adequate the amount of testosterone delivered, the tissue in the fetus does not react by forming male sexual reproductive parts. Male sexual anatomy does not form. This baby will appear to be female.

Scenario 9: The fetus partially reacts to testosterone. This condition is called Partial Androgen Insensitivity Syndrome. The sexual anatomy partially forms. This baby may have ambiguous genitalia (an extremely small penis). This can also cause mixed sexual reproductive organs.

Scenario 10: Some XX fetuses (female) have genetically inherited a malfunction that will occur in one or more of six enzymes that make steroid hormones. For example, cortisol (the stress hormone) may be under produced, while testosterone is overproduced. This can cause masculinization of genitalia at birth or even later. The female baby will have a small penis even though the internal organs will be of the female reproductive system.

Scenario 11: In a remote village in the Dominican Republic called Guevedoce, one percent of the boys begin their lives as girls. Then when puberty starts at age 12 or so, a penis and testes form. This is hard to comprehend. These boys are often an accepted part of the culture and are called machihembras, which means “first a woman, then a man”. These children are also present in Papua, New Guinea and in parts of Turkey.

These are only a sample of the ways in which development of anatomy can differ from chromosomal sex. There is so much that scientists still don't understand about how we come to know our

gender. Just to provide a hint of things to come: examining the role of cell proteins in the body promises to add more layers to the complexity of gender.



If you are scratching your head or getting ready to just give up, hang in there. This is important information. It opens the door for you to understand why gender is not simply two boxes. And when you understand that, you will become a more understanding member of your community. You will know that being transgender or somewhere on that spectrum is not a matter of choice but a result of biology.

INTERSEX/DISORDERS OF SEXUAL DEVELOPMENT

In a number of the scenarios above, newborn infants are born with genitalia that are neither clearly a penis nor a vagina. The penis may be very small or the clitoris may be much larger than typical. As you might imagine, this creates quite the crisis after delivery. Eager parents wait to have the gender affirmed or confirmed, and the medical personnel lack a clear answer to “what is it?” Often,

there is no issue with urination as the opening for urine functions typically. There is no medical emergency that requires action for the health of the baby. The baby has ambiguous genitalia. The term used to describe this condition is Intersex. Medical terminology uses Disorders of Sexual Development.

Not surprisingly, when babies are born with ambiguous genitalia, there is a great desire on the part of medicine and parents/family to make the infant “normal”. As a result, doctors have repaired the ambiguous genitalia. Given how difficult it is to construct a fully functioning penis, the doctors have chosen to create the easier option, a vagina. Many of these children are “turned into females”. The theory was that if you create a vagina and raise the child as a female, it would be so. We learned the hard way that gender is not just about how your genitals look. Many individuals who were born intersex have finally gained the courage to come forward and tell their stories. Their stories often involve being in a body that in no way matched their gender sense of themselves. This disconnect had profound consequences. And many had no idea that they had been “corrected” at birth. Sadly, many of these corrections involve multiple surgeries over the life of the child/adult.

The term intersex is accepted by some and rejected by others. Similarly, the use of Disorders of Sexual Development as a classification is controversial. Individuals who have ambiguous genitalia or mixed sexual anatomy often don’t consider themselves disordered. The only benefit to calling these atypical developments a disorder is to allow insurance companies to cover necessary medical treatment. The American Academy of Pediatrics no longer recommends any surgical intervention immediately after birth for babies with ambiguous genitalia. Individuals who have lived the intersex experience recommend no surgical intervention until the child is older and is demonstrating their own gender identities. Although this choice comes with

challenges, on balance, waiting offers the most flexibility and offers the child a voice in their own gender identity.

Struggling with gender identity can also result in psychological challenges. Imagine growing up with sexual anatomy that does not match one's felt sense of gender. Imagine growing up with typical sexual anatomy and a sense that this anatomy does not fit your felt sense of gender. And you live in a world of male and female boxes with very strict rules. Not surprisingly, gender identity issues cause depression and anxiety. The field of psychology has tried to find a way to describe this experience, and they have had mixed success. The classification manual for psychological disorders is called the Diagnostic and Statistical Manual of Psychological Disorders. For years, this manual included a disorder called Gender Identity Disorder. The transgender community had a very difficult time being given a disorder that was actually the result of cultural condemnation. As many a person said, if the world outside accepted who I am, I would not have a disorder. In an effort to give voice to these concerns, the experts came up with the term Gender Dysphoria. This is now the name given to those who are having difficulty coping with being transgender. Again, the question remains – whose problem is this? The person's or the culture's? At the present time, there is an uneasy truce where this disorder is concerned. Insurance once again plays a huge role as more and more coverage is being provided for the medical and psychological costs of transition. The trans community needs this financial help, so for now, the categories remain as they are.

Most of the time, assigned sex at birth and expressed/felt gender match, but in no way is that a certainty. The notion that gender is determined by sexual anatomy is simply incorrect. Enough information now exists to accept that as fact.

THE BRAIN

Let us not forget one more major player in the determination of gender. This small powerful organ determines who we are. The brain takes up a relatively small amount of space in the body, but its role in development cannot be underestimated. Science has learned a great deal about chromosomes, DNA, and genes. Much is known about the ways in which these affect everything about us, including gender. When it comes to the brain, far less is known. Science is at the bare beginnings of understanding the ways in which the brain influences our behaviors.

In early days, researchers discovered that the hippocampus in the brain had something to do with the making of memories. For years, scientific thought was guided by the focus on the hippocampus. As computer imaging became more sophisticated, researchers could watch activity in the brain in response to memory exercises, and lo and behold, lots of areas of the brain seemed to be involved in memory. The brain is an integrated system that relies on many parts to do one particular activity. So much for the old adage that we only use 10% of our brains!

Gender is complex. A day may come when science can identify certain parts of the brain that contribute to gender identity, but we are not there yet. And suppose we were able to identify actual mechanisms at work. What then? There would be many ethical dilemmas of how best to use this information.

Suffice it to say that the brain is clearly involved in our sense of ourselves, gender included. Our best avenue of inquiry at this time is to be open to the lived experiences of people who are brave enough to talk about their own struggles with gender identity or lack of gender identity. There is abundant information to be gathered from these people.

DEVELOPMENT OF GENDER IDENTITY

How early do children begin to categorize their world into male and female? According to Anne Fausto-Sterling in *Sex/Gender Biology in a Social World*, research has shown that babies as young as three to four months distinguish between male and female voices and male and female faces. By ten months, they match pictures of males with male voices and the same with females. By two years of age, they link objects with gender. This is where we see boy's preference for trucks and girl's for dolls. Is this based on biology or culture? Probably both.

By the third year, they are identifying themselves as boy or girl. They are consistently choosing activities that mark their gender identification. Interestingly enough, they don't understand that gender is a constant feature until they are a bit older. This is why two and a half year olds may want to become a puppy. By the age of four, they know that isn't possible.

Gender nonconforming children often give indications of their confusion at an early age. A female child at three years of age wants to know where is their penis. If they have seen other boys, this makes sense and is a temporary question. For some female children, it continues to be a more insistent question. Male children may begin to self identify as female. Some may ask why they were made with a penis, when they should have a vagina. One four year old asked to go back inside their mommy's tummy and come out right as a girl. One asked their mom why did God make them with a penis when God knew they were a girl. Understandably, these questions can raise concerns for parents. If parents let some time pass, they will see if this gender confusion persists or moves on. For a certain number of children, their concerns about gender become persistent, consistent and insistent. Knowing what we now know about how gender can vary from sexual anatomy, there is reason to pay attention.

For the child who evidences gender confusion, there is help available. There are many online resources available that will help give parents needed information. There are forums where parents can talk with other parents. If a parent feels adrift with no idea of what to do, there are others who have been there. The biggest hurdle is learning to listen to the child. Some children know from a very early age that what they are feeling and what they are seeing in terms of their anatomy are two different genders. The parents' challenge is to listen and accept that the child is confronting a difficult dilemma.

Therapists, doctors, social workers and other specialists across the country are working with children and families as they address this challenge. This is new territory because in the past children were ignored and reprimanded for expressing these feelings. Because we are learning about the realities of gender confusion, we will be able to generate good solid research on children who make transitions at earlier ages and those who didn't. At this point, we do have some persuasive research already that indicates allowing children to follow what they feel results in a lower incidence of depression, anxiety and suicidal behaviors. For children who are able to live their gender identity, mental health outcomes improve dramatically. A key component of this is family support. Forty-three percent of homeless youth are lesbian, gay, transgender and intersex. Imagine how hard life is to have no choice in who you are and to have no family there for support.

Medicine has made advances that allow these children to delay puberty until they are more mature and more certain of their choices. This is life saving because going through puberty causes physical changes that can only be changed through painful and expensive medical procedures later in life. Some cannot be changed at all. The most common comment made by transgender people is that living as who they are is life saving. When we

consider that 40% of transgender youth will attempt suicide, we realize the importance of living authentically.

There are also a number of people who identify as non- binary, queer, gender fluid and other descriptors. This is a rejection of all aspects of the division of humans into male and female. The experience for these individuals does not require a label and is not dependent on sexual anatomy or dress. These people are also part of the gender non-conforming population.

HAVE I SOLVED MY MYSTERY?

Not really. There is no way for me to know exactly which of these conditions caused my own gender confusion. Something that hasn't even been discovered may be the cause. I can only be confident in what I have felt over my lifetime. I had expected to make peace with the confusion over the course of my lifetime. That never happened. At the age of 63, I transitioned to male. The result has been indescribable. To look in the mirror and see myself is life altering. Puberty at the age of 63 was interesting, but I welcomed the lowering of my voice and the facial hair. Only others who have been there will fully appreciate my story.

FINAL THOUGHTS

There is a great deal of important information included in this booklet. It bears reading again and again in order to absorb it. I think about my own life and what a difference it would have made to live as my known self. I will never know the answer to that. I have had a good life, but one full of questioning, discomfort, and depression at times. I write this booklet for the children who feel the way I felt. They deserve to have a voice, and they deserve to have others understand that being transgender is not a choice. The result is being an outcast in your own culture, and the cost of that is high. Being hated, demeaned

and demonized exacts a price. For all of those who have transitioned or decided not to live in a binary world, you are courageous. For those who have to wait or may never be able to transition, we hear you. You are all setting an example for those children who want someone to hear that they know their own gender. To all the professionals and families who are working to make the world a better place for these children and adults, thank you for your dedication and courage. Every life saved is one more teacher for us all.

THE ROLE OF PFLAG

PFLAG (Parents and Friends of Lesbians and Gays) began as a safe and welcoming place to those who have loved ones in the LGBTQI+ community. Its mission has expanded over the years to incorporate those who are lesbian, gay, bisexual, transgender, intersex, queer, allies and beyond. The membership includes people who have walked every aspect of this journey of difference. Local chapters provide information, education and support. This booklet is intended for all who might benefit from the information provided. Our mission is to change the world one booklet at a time.

References

Much of the information contained in this booklet came from the following sources.

Delisle, R. (2018). Intersex: When a baby isn't quite boy or girl. Today's Parent. Retrieved from: <https://www.todaysparent.com/baby/baby-health/intersex-when-a-baby-isnt-quite-boy-or-girl/>

Fausto-Sterling, A. (2012). Sex/Gender: Biology in a Social World. New York, NY: Routledge.

McCarthy, M. M. (2015). Sex differences in the brain. The Scientist. Retrieved from: <https://www.the-scientist.com/?articles.view/articleNo/44096/title/Sex-Differences-in-the-Brain/>

Science Daily (2017). How hospitals respond when it's uncertain if the newborn is a boy or a girl. Retrieved from: <https://www.sciencedaily.com/releases/2017/10/171023123748.htm>

Transgender Lives: Your Stories. The New York Times. Retrieved from: <https://www.nytimes.com/interactive/2015/opinion/transgender-today>

Resources

Skagit PFLAG

www.pflagskagit.org/

www.facebook.com/Skagit-Pflag

Whatcom PFLAG

<http://www.whatcompflag.org>

www.facebook.com/Whatcom-Pflag

Ingersoll Gender Center Seattle.

ingersollgendercenter.org

Seattle Children's Hospital/Gender Clinic

<http://www.seattlechildrens.org/clinics-programs/gender-clinic/>

Intersex Society of North America

<http://isna.org>

WHY AM I TRANSGENDER?

CLUES FROM BIOLOGY

LINDEN G. JORDAN, MA, JD



FINALLY!!!!

Linden Jordan is on the Board of Skagit PFLAG and also serves on The Speakers' Bureau. His careers have included attorney, mental health counselor and college professor. Throughout his life, he has been very active in the LGBTQ+ communities. He currently lives in Marblemount, where he enjoys volunteering with PFLAG.