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Human Sexuality: Logical Fallacies and the Shotgun Aim of Arguments from Nature

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Observations from nature employed to challenge a traditional model of binary human sex, fixed at conception, typically draw on the diversity of sex expression and plasticity in the animal kingdom, variable fetal developmental pathways in humans that result in intersex conditions, or purported minor sexual dimorphism in humans. This article draws attention to logical fallacies unconsciously employed when projecting observations of biological phenomena to what should be affirmed, or what is possible, for humans. A recent publication by three Christian researchers, encapsulating multiple aspects of arguments from nature, serves as an expedient example for critique.

Keywords: diversity in nature, sex transition, intersex, sexual dimorphism, logical fallacies, ethics, human design, science in society

Of the many subjects of contention in American society, sexuality and gender rank among the highest. The rancor created by the 2024 rewrite of Title IX, the landmark US ruling against discrimination based on sex, to mandate affirmation of gender identity, serves as a milestone in the polarization of Western culture.¹ On questions as fundamental as what a man or a woman is, one might expect Christians to be of uniform mind, yet traditional understandings of sex, sexuality, and gender are increasingly called into question from within the Christian community.²

Challenges to traditional understandings commonly take two approaches: interpretation of biblical texts as culturally malleable or misunderstood,³ or drawing examples from nature to argue for acceptance of more diverse human sexual behavior or identification.⁴ The focus of

this article is on the latter, with particular attention to the biology of sex and medical transitions. Other important conversations related to sex, such as same-sex attraction or societal expectations of gender, are beyond the scope of this work.

Given the context, my use of the terms *sex* and *gender* refer only to biological phenomena and are not differentiated, though with acknowledgment that differences in definition have their place in broader contexts. *Sex expression* refers to the biological development of an embryo. Use of *gender-affirmation* refers principally to medical interventions to conform the body to match a perceived identity. Lastly, *behavior* refers not only to physical actions, but also to decisions to affirm or deny identities that may conflict with biological expression.

Observations drawn from nature to question traditional Christian views of binary or fixed sex draw attention to sexual and reproductive diversity in the animal kingdom, fetal-development pathways in humans that result in ambiguous or conflicting sex-expression, and/or purported

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minor sexual dimorphism in humans. The specific natural phenomenon varies, but the underlying reasoning is the same, arguing that the diversity of how sex is expressed in nature should serve as a model for embracing similar or related diversity in humans, including the ability to medically transition from one sex to another.

Advocates represent a broad swath of religious and non-religious belief, including those identifying as Christians with an interest in reconciling biblical texts with science. Examples include Justin Sabia-Tanis,⁵ Joan Roughgarden,⁶ Mark Achtemeier,⁷ Austen Hartke,⁸ Megan DeFranza,⁹ Linda Tatro Herzer,¹⁰ Jennifer Anne Cox,¹¹ Myron Penner, April Cordero, and Amanda Nichols.¹² These writers and their work do not just reside at the fringes of current Christian thought. Current or recent professional appointments at Christian institutions include United Theological Seminary, Point Loma Nazarene University, Trinity Western University, Oklahoma Christian University, and Tabor College (Perth, Australia). Contracts with Christian publishers include Baker Academic, Pilgrim Press, Eerdmans, and Westminster John Knox Press.

My chief concern, and focus of this article, is on the logic of linking observations in nature with affirmations of human sex transitions. In my assessment, such arguments unconsciously employ logical fallacies and pay too little attention to how the logic that is applied in support of a favored viewpoint may be equally applied to a broad spectrum of less-favored views or outcomes. A shotgun loaded with birdshot will place a few pellets in the bullseye of a target at close range, but an expanded view may reveal the entire sheet to be shredded. On the present topic, the possible collateral damage extends beyond questions of normal or ethical behavior, to how human bodies are best served medically.

To illustrate the problems, it is expedient to select a recent representative publication that broadly encapsulates the arguments-from-nature position. A paper published in *TheoLogica* in 2023, by Penner, Cordero, and Nichols,¹³ serves this purpose, in that it includes multiple elements pertinent to the present concern.

- It challenges traditionally understood biologically based sex-essentialism in which all humans fall into immutable binary categories of male and female.
- Observations from nature are cited as relevant guides for human decisions related to sex identity and transitions.

- The authors profess Christian faith and an interest in applying their expertise to inform Christian practice.
- It is representative of current thought from a gender-affirming perspective, published within the last 24 months.
- It offers a clear and concise academic defense of its position.

As other papers or books could have served as well, my assessment should not be taken as a desire to single out these authors for scrutiny.¹⁴ To minimize repetition of their names, their paper will henceforth be referred to by the authors' last name initials (PCN).

PCN argue for contingent-sex and fluidity of sex in humans based on examples of environmentally mutable sex from the animal kingdom, the existence of variable fetal sexual developmental pathways in humans, and claims of low human sexual dimorphism. Key elements of their paper are as follows:

1. For theological questions that concern the nature and functioning of biological organisms, science should be allowed to take the lead in providing the pertinent data for consideration.
2. Behavior and life cycles found in the animal kingdom are pertinent for addressing what should be considered acceptable for humans, as we share much of the same DNA. Examples of contingent sexual expression include (a) organisms capable of transitioning in adulthood from functional female to functional male, and (b) organisms in which sex at birth is contingent on environmental conditions.
3. Sexual expression in humans does not always follow the binary norm: (a) variations in human fetal development can result in reproductive organs that do not match genetic coding, complicating a simplistic male-female modality, and (b) variations of the typical XX or XY sex chromosomes sometimes occur at the time of conception, resulting in infants who do not neatly fit within the male-female dichotomy (collectively referred to as *intersex*).
4. One's own fetal development and sex could have followed innumerable different pathways, leading to expression of sex in nontypical ways. In "the language of possible worlds," any individual alive today could have been born intersex.
5. Humans retain a degree of "genetic infrastructure" for sex expression opposite of their birth

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sex throughout their life, providing a foundation for potential transition.

6. Humans exhibit a low degree of sexual dimorphism beyond genitalia, arguing against binary “maleness” or “femaleness” and minimizing barriers to transitions.

They conclude,

Instead of thinking that people who undergo medical or surgical interventions to facilitate sex transition are “going against their biological nature,” a better way to understand their actions would be to see them as building or repairing the ramps from one path to the other—both of which are part of one’s human nature.¹⁵

My critique does not address the itemized points individually. Rather, it addresses the terms employed to frame the question, the logic of biological comparisons (between species, between normal and aberrant developmental pathways, between sexes), the logic of basing human ethics on examples from nature, and, lastly, the tenuous role science is actually allowed to play.

Framing the Question

PCN frame the question of human sex in terms of being an *essential* or *contingent* property. An essential property is described as “a property or feature that a thing must have in every scenario possible.” An essential view of human sex is cast as a belief that all humans fall into immutable binary biological categories of male or female. A contingent property is “a property or feature that a thing may have in some scenarios, but fails to have in other scenarios.” A contingent view holds that sex is not a fixed characteristic in humans, and that sex is not limited to binary options. Humans may fall on a spectrum of sex or choose to change their sex.¹⁶

The choices offered present the first logical fallacy—a *false dichotomy*, where terms are unnecessarily defined to be mutually exclusive or as if they are the only choices available. If an essentialist view requires all humans to be clearly male or female, it takes only one person to be born with ambiguous reproductive organs to invalidate the argument.¹⁷ An essentialist position defined in this way is a strawman. The debate is better framed with questions regarding whether the human biological *design* is constructed around a fixed binary model of sex, if occurrences of mixed or ambiguous reproductive organs fall on a normal spectrum of human development or

represent medical disorders, and if the contingent nature of sex found in nonmammals has meaningful bearing on humans.

Of Fish and Turtles

PCN describe the life cycle of the blue-headed wrasse, a colorful marine reef species, as an example of sex transitions in nature. Under the right environmental conditions, an egg-producing female will morph to become a fully functional male. Such transitions have been documented under controlled conditions in aquariums and in natural environments.¹⁸ In a similar vein, the red-eared slider, a partially aquatic turtle and common pet, is described as an example of birth-sex being contingent on environmental variables rather than tied to a specific genetic coding. For any given egg, the sex of the hatching depends on the incubation temperature.¹⁹

Many other examples from nature could be employed to demonstrate contingency, plasticity, or non-dimorphism of sex, either during embryonic development or as adults, particularly as one moves farther down the line of last-shared-common-ancestor with humans. Sea slugs are hermaphroditic, capable of reciprocally inseminating one another during mating.²⁰ Many plant species contain male and female organs and can self-pollinate.²¹ The question, however, is not whether contingent sex exists in nature, but if that existence is relevant for understanding sex in humans or, more broadly, *mammals*.

Comparisons of sex determination between humans and nonmammals suffer the *false equivalence* problem, commonly referred to as “comparing apples and oranges.” Mammals are genetically preprogrammed at conception for a particular sex. That programming can be sidetracked by genetic copying errors at the time of fertilization, or interrupted in various ways during embryonic development, to produce a result inconsistent with that programming, but such occasions represent anomalous development. Of significance, such alternate pathways typically result in a suite of ailments beyond reproduction.²² After birth, no environmental stressors, internally or externally, will drive an individual mammal to shift from one functional sex to another.²³ At most, chemical influences after birth may shift anatomical development of isolated organs in a direction more typical of the opposite sex, such as breast development in young males with exposure to lavender.²⁴ In all such cases, the resulting changes fall short of altering the functional sex of the individual.

Human Sexual Dimorphism and (Non) Plasticity

There are no natural pathways to changing post-gestational sex in mammals, but perhaps one can medically intervene to create pathways that do not otherwise exist in nature. This could be possible, in principle, if the differences between human males and females is minor, limited to reproductive organs. Such is the reason for PCN and others²⁵ to refer to sexual dimorphism in humans as relatively minor.²⁶ Evidence commonly brought to bear includes the overlap in physical traits of males and females, such as height, body mass, speed, strength, aptitudes, or aggression. For any trait that is typical of males and typical of females, there is a spectrum of characteristics within populations that overlap. It is quite possible, for example, to find an individual female who is stronger, faster, or more aggressive than an individual male.

Such observations are pertinent to discussions of what it means to be a man or to be a woman in the context of a particular society, but when it is offered as evidence of biological sameness or of interchangeability, the possibility of a *category mistake* is raised. As an illustration, drawing upon apples and oranges again, we can observe that the spectrum of physical traits of apples and of oranges overlaps significantly (e.g., size, shape, pericarp thickness, seed number/size/position, durability). But if such examples are cited as evidence of sameness or that there is a pathway for transitioning from one to the other, a category mistake has been made – in this case, by overlooking or ignoring vital differences that put them into distinct categories (e.g., species) despite their similarities and overlapping characteristics.

Few will suggest that human males and females are *entirely* the same, as reproductive systems are clearly dimorphic. But beyond reproductive organs, are they similar enough to declare that sexual dimorphism is minor, sufficient to make transition from one sex to another possible? The question can be addressed broadly with observations at the population level and, more specifically, with studies of individuals. Broadly speaking, if sexual dimorphism is indeed minor, limited to reproductive organs, one must explain why underrepresentation of women in non-reproductive clinical trials is problematic.²⁷ If male and female are otherwise interchangeable, any random selection of males for a clinical trial should be sufficient to assess the potential and the risks for all

humans. Yet evidence is steadily growing that trials based on one sex are not sufficient.²⁸

This observation is bolstered by studies of individuals in which researchers report significant differences between human males and females in nearly every organ and biological function. A random sampling of studies includes sexual dimorphism in bone microstructure,²⁹ kidney function,³⁰ lipid storage and glucose metabolism,³¹ neuron development or activity in the infundibular nucleus (brain),³² retinal nerve structure,³³ thyroid reactive oxygen species production,³⁴ architecture of lung gas exchange,³⁵ and even pain perception tied to the activation of nociceptors.³⁶ The differences go beyond macrostructures of the size and shape of organs, to the functioning and character of individual cells.³⁷

Even without rigorous physiological and anatomical investigation, one has only to look at global athletics or the disparate impact of the same product on males and females. The absence of women in men's sports may, in some cases, be linked to discriminatory practice but, in general, is because of nontrivial sexual dimorphism. Without significant dimorphism, there would be no need for a separate category of sports limited to females.

The disparate impact of smart phones on girls vs. boys is now well established.³⁸ While one cannot say that every girl responds the same to the social pressures created in the digital universe, the fact that researchers see dramatic differences in populations of girls and of boys speaks directly to the reality of sexual dimorphism. Some will undoubtedly argue that those differences are a result of societal conditioning, not fundamental differences in biology, yet we are seeing the divergent results at a time when supposed differences have been minimized or trivialized more than at any other time in Western history. Genuine differences go far deeper than reproductive anatomy or societal programming.

In mammals, there is no “ramp” or “bridge” that may be “built or repaired”³⁹ that moves naturally, and without serious consequences, from one sex to the other. Transition surgeries remove healthy organs and build an edifice of tissues that resemble reproductive organs in appearance, yet with no (or vastly limited) functionality and often require lifelong medical treatments to maintain.⁴⁰

One may counter that failure to produce functional changes in sex is because the medical science is

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young. We may yet reach a time when a reproductive organ may be constructed or transplanted that is functional and requires no life-long treatments to maintain. Yet, even in this imagined future, change would be limited to an isolated set of organs and chemical treatments to address a narrow range of physiological responses. It ignores the fact that chromosomal sex influences far more than reproductive organs. As some researchers have noted, every cell of the human body is affected by the genetic coding of sex.⁴¹ No surgery or hormone treatment can alter sex at the cellular level.

Alternate Developmental Pathways, Genetic Anomalies, and Intersex

The possibility of variant developmental pathways during mammalian gestation merits additional consideration. PCN devote a significant portion of their paper to the description of the chemical pathways responsible for sexual development in a human fetus, with an emphasis on the various ways that sexual expression can deviate from genetic instruction.⁴² Of particular note, sexual differentiation is said to begin at week 6, at which point the normal pathway to male or female sexual configurations can take alternate pathways, leading to reproductive organs that do not align with chromosomal coding. To say this in another way, the genetic code for typical male or female development may be intact, but the normal pathways of development can be bumped along an atypical pathway. The result can range from indistinct or ambiguous reproductive organs to what appears to be normal organs belonging to the opposite sex.

The inference that there is no difference in embryos prior to week 6 is unjustified, as some fertility researchers have identified sex differences in morphokinetic development even at the very earliest stages of cell division.⁴³ There is no disagreement, however, that variant pathways can lead to sexual expression that do not match genetic coding. As an illustrative example (this time with a mammal), when the undifferentiated gonads of a male fetal rabbit were removed, the rabbit developed female (non-gonadal) organs.⁴⁴

Such phenomena serve as a justification for PCN to declare a binary sex for humans to be an oversimplification. This reasoning also suffers from an equivalence fallacy, this time conflating the *existence*

of anomalies in nature with *how nature is designed* to function.

Fetal sexual development that does not match the chromosomal coding represents a miscue in the chemical signaling that diverts the normal pathway. It is a pathway that was not supposed to happen, genetically speaking, and leads to abnormal development. In humans, if not fatal prior to birth, these alternate pathways result in a spectrum of medical conditions and symptoms that extend beyond the reproductive system.⁴⁵

Genetic abnormalities in the X or Y chromosomes fall into a similar category of abnormal fetal development, the only difference being the root cause. If the genetic coding of X or Y chromosomes is abnormal, fetal development will be as well. Many different combinations of the usual XX or XY chromosomal pairs have been identified, each leading to unique biological expression and medical conditions. Variants include a single X (Turner syndrome), XXX (trisomy X), XXY (Klinefelter syndrome), XYY (Jacobs syndrome), a combination of both XX and XY, or missing or duplicated fragments of a chromosome. As a whole, children born with these developmental or genetic conditions are referred to as *intersex*, particularly when the reproductive organs are ambiguous or reflect the opposite chromosomal sex. As acknowledged earlier, intersex individuals do not fit neatly into a binary sense of male and female.

How we define the end result of an atypical developmental pathway plays a critical role for addressing questions of human sex. Consider another analogy using a different aspect of human design. Human anatomy is defined as having bilateral symmetry, with, among other things, two arms and two legs with mirror-image construction. In the 1970s, the Voyager missions launched two vessels on journeys into deep space with payloads of information about life on Earth for any inquisitive extraterrestrials.⁴⁶ Diagrams of human anatomy included examples of male and female, each with two arms and two legs. Yet we know from experience that there are occasions when a child is born with only a single arm, or no arms at all. Such a child is no less human, but there are few who would suggest that the existence of such individuals means the Voyager information got human anatomy wrong, or worse, overlooked a *category* of human. A missing appendage is understood to represent a biological malfunction, not an example on a spectrum of normal fetal development.

Textbooks on human anatomy are not in need of revision to include separate designations for *quad-*, *tri-*, *mono-*, and *a*-limbed humans.

If we are consistent, intersex conditions are likewise recognized as products of biological miscues that hinder the normal development of one sex or the other. Just as a child born with a missing limb does not represent a new category of human symmetry, a child with ambiguous genitalia does not represent a new category of sex.

I recognize that a common reaction to such descriptions is a complaint that it characterizes individuals as “mistakes.”⁴⁷ There is merit in avoiding tagging anyone with such a label, though the next step of removing the language of error from biology is based on another false equivalency, for it conflates *condition* with *value*. As a parallel example, a person who experiences loss of sight, either at birth or later in life, has a condition of blindness. It is not as nature designed a human to be. But blindness is not a measure of worth. A mistake of biology does not equate to a devaluation of human value and dignity.

Efforts to destigmatize medical conditions or disabilities can be commendable, but also problematic when recasting errors of biology to be part of a spectrum of normal human development. If everything is identified as normal, there is nothing that requires unique medical attention, and nothing that needs to be fixed, even if we have the capacity to do so. Consider a few examples of conditions we would no longer consider problems if all developmental pathways are just part of the normal expression of human biology.

Normal Chromosomes, but Variable Developmental Pathways

Fetal alcohol syndrome: Frequent or high levels of alcohol exposure *in utero* inserts an atypical chemical into the normal developmental process, affecting facial features, nervous system, sensory organs, and having repercussions on juvenile growth, language, and social development.⁴⁸

Conjoined twins: Multiples in the womb normally develop independently, the same as any individual child, though having to share maternal resources. Atypical development can, in rare cases, result in a comingling of tissues such that a portion of two bodies are fused. In some cases, the two can be surgically separated. In other cases, organs are so comingled that separation will cause the death of one or both.⁴⁹

Extra appendage: There are occasions when the genetic coding is normal but the process of activating or deactivating genes takes an alternate pathway, leading to the creation of an extra digit or entire limb. The most common is an extra finger or toe, but a recent case includes an arm growing from the back of a newborn that was surgically removed.⁵⁰

Genetic Disorders⁵¹

Cri du chat syndrome: Named for infants that sound like a mewling cat, the disorder results from a missing piece of chromosome 5. More serious symptoms include a suite of conditions such as heart and gastrointestinal defects.⁵²

Hemophilia: Mutations in the FVIII or FIX genes result in interference with the normal blood clotting process following an injury, making it difficult to stop bleeding.⁵³

Sickle Cell Anemia: Sickle cell is an inherited mutation in the HBB gene creating misshapen red blood cells. Though conferring one documented benefit of greater resistance to malaria, accompanying medical conditions often include fatigue, infections, severe pain from tissue damage, and swelling in hands and feet.⁵⁴

The list could go on for many pages, but a short list is sufficient to make the point that there are many ways in which biological development can go wrong, not just those related to sex. Drawing on just one of the examples, breakthroughs in CRISPR technology have revolutionized our potential to reverse the effects of some genetic disorders such as sickle cell anemia.⁵⁵ But if alternate developmental pathways are not disorders, just simply variants of human expression, we have no need to treat or reverse. No one, thankfully, is suggesting such a course of inaction for sickle cell anemia, but a consistent application of the logic of normalizing atypical sexual development would argue for such an outcome. This is one example of the shotgun aim of an argument used for a favored application that does not sufficiently consider how it equally applies to less-favored outcomes.

It is important to clarify that not all biological anomalies require fixing. Some infants with intersex conditions have undoubtedly been rushed too quickly into corrective surgeries. Just as some people who are deaf decide to forgo corrective measures and embrace their condition and the unique community it fosters, some with intersex conditions may choose to

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do the same. Neither requires erasing the language or designation of biological error.

Ethics and Examples from Nature

In this section, I move from discussion of biological processes to the philosophical and ethical implications of using observations in nature to justify human behavior or identity. Employing facts from nature to advocate for specific human practices runs the risk of the *is-ought fallacy*. Hume's Law, derived from David Hume's 1739 *Treatise of Human Nature*, is the thesis that a moral or ethical judgment, "what ought to be," cannot be logically derived simply from "what is observed."⁵⁶ As an example unrelated to nature, it may be true that 60% of students cheat on exams,⁵⁷ but what is observed does not logically lead to the conclusion that cheating ought to be condoned or justified.

In the present context, observations of contingent or pliable sex in nature (*what is*) do not logically lead to the conclusion that attempts to alter the sex of a human is morally or ethically defensible (*what ought to be*). Here again, insufficient attention is given to the shotgun aim: the same argument employed to justify a favored human behavior can be equally applied to a host of other less-favored behaviors.

A series of observations from the animal kingdom is provided below, each related to sex or sexuality, with subheadings that indicate what the behavior would be called *if done by humans*. In some cases, the relevance may be questioned if an observed behavior is considered an anomalous or "one off" incident, but examples brought to bear by PCN and others justifying a spectrum of sexual expression also include anomalous natural phenomena such as miscues in embryonic development.⁵⁸

In principle, it is necessary to identify only two or three examples of animal behavior to make the point, but a longer list is worthwhile to illustrate how many nontraditional behaviors or societal taboos can be challenged with examples from nature.⁵⁹ Several of the examples include dolphins, which are particularly relevant given their highly intelligent, social, and playful character, and noting that we share far more DNA with them than we do with fish or turtles.⁶⁰

Polyamory: Sex with many partners is not just occasionally found within the animal kingdom, it is nearly universal. Even among animals known for returning each season to the same mate, such as

the iconic swan, DNA studies of offspring have confirmed that nearly all engage in "extra-marital" trysts.⁶¹

Non-consensual sex: Though rape is a word generally reserved for human interactions, the common elements of stalking, overpowering, and forcing copulation is common among animals. Among sharks, such as nurse and tiger sharks, males will bite the pectoral fin of a female, wrestling her into submission before forcibly mating, often leaving permanent scars.⁶²

Gang rape: Groups of male dolphins have been observed to work as a team to chase down an uncooperative female, subdue, and take turns inseminating.⁶³

Pedophilia: Sex (or attempted sex) with juveniles is not uncommon in the animal kingdom, including dolphins,⁶⁴ seals,⁶⁵ and penguins.⁶⁶

Incest: Sex between parent and offspring is common among a long list of animals.⁶⁷

Harems and violent exclusion of other males: Elephant seals are iconic examples of violent battles in the animal kingdom, with forceable removal of weaker or less aggressive males and herding of nonconsenting females into harems.⁶⁸

Zoophilia/bestiality: Fur seals on Marion Island have been observed chasing, mounting, and attempting copulation with king penguins.⁶⁹ Dolphins are known to engage in sexual interactions with humans, with some reports of male dolphins pushing away human males and focusing sexual attention on female swimmers.⁷⁰

Necrophilia: Sex (or attempted sex) with dead bodies has been observed in mammals, birds, reptiles, and amphibians.⁷¹

Humans are known to engage in some variation of all of the above, particularly polyamory (with or without mutual consent). Indeed, polyamory is on the rise in Western society, with dating sites now making routine use of the abbreviation ENM (ethical non-monogamy) for those looking to add another girlfriend or boyfriend to an existing long-term relationship.⁷²

It is worth adding that the shotgun aim of employing examples from nature as the basis for justifying human decisions, identity, or affirmations extends well beyond questions of sexuality. Consider an additional short list of examples from nature and labels applied if practiced by humans.

Slavery: Many species of ants are known to engage in “social parasitism,” routinely stealing the pupae of other ant colonies to raise as slaves.⁷³

Conquest: Male loons (an aquatic bird) will invade the space of another loon, with territorial evictions frequently fatal for the displaced owner.⁷⁴

Sadism: Cats are known for tormenting birds or mice they catch. Orcas in the wild are known to harass and kill other animals, such as dolphins, with no intention of eating them.⁷⁵

Infanticide and cannibalism: A new alpha male in a tribe of chimps may kill the offspring sired by a competing male to give way for his own, sometimes eating the slain infants.⁷⁶ Male polar bears are not squeamish about making a meal out of an unprotected cub.⁷⁷

Eugenics: Some spiders have been observed to not only prefer young suitors, but also to selectively kill older ones, weeding potentially degraded DNA from the gene pool.⁷⁸

Does Science Even Matter?

The preceding discussion was all predicated on an assumption that science has a meaningful role to play in the discussion of human sex and sexuality. PCN explicitly argue that science should be allowed to

take the lead in providing data to address theological questions that concern the nature and functioning of biological organisms and physical systems ... the place to start for understanding how sex is expressed in humans is biology, not the Bible.⁷⁹

The value or truth of that statement is not a foregone conclusion, but I will set that particular debate aside to consider the question of whether the *listen-to-science* proposal is actually being followed.

In current Western culture, the link between science and human sexuality has proven to be a moving target. Abigail Favale, a Catholic scholar on feminism and women’s dignity, identifies second-wave feminism as the source of separating gender from sex: in this view sex was considered a biological reality and gender was a social construct. According to Favale, third-wave feminism turned this upside down: now sex is the construct and one’s perception of gender is real.⁸⁰

The confusion created by shifting definitions was brought to national attention when Justice Ketanji

Brown Jackson was asked during her confirmation hearings if she could provide a definition of the word *woman*. Jackson famously answered, “I’m not a biologist.” Supporters gave her credit for her attempt, but scrambled to emphasize that a biologist can’t answer the question either.⁸¹

Arguments offered by PCN appear to follow a similar pattern, employing a *conceptual shift fallacy* in which an argument is built on a particular foundation, in this case on science, but basing conclusions on something else. Though most of the paper is devoted to the science of contingency of sex expression, the final recommendations for humans retain only a thematic tie to the science. The authors acknowledge that humans do not share the biological plasticity of fish or turtles,⁸² and tacitly acknowledge that “ramps” to alternate development of reproductive anatomy in humans end while still in the womb.⁸³

What is left is a thought exercise in which, in the “language of many possible worlds,” any individual alive today *could have* experienced an alternate developmental pathway during gestation resulting in an intersex condition. That historical possibility is said to represent an “ongoing presence of parallel paths” throughout life, with the potential to create a ramp from the actually expressed pathway to an alternate pathway that could have been.⁸⁴ Yet, there is no scientific evidence that post-gestational offramps to an imagined alternate pathway are possible. In the analogy of a highway, the hypothesized offramp may be more accurately imagined as discharging into an open field with the potential for serious and permanent vehicular damage.

This presents an interesting quandary. Science is called upon to challenge simple binary concepts of sex, but when it comes to the question of whether a person is male or female, biology is deemed incapable of providing an answer.⁸⁵ When the metric for reality is what one feels themselves to be, we are no longer in the realm of science. We are left in rhetorical quicksand, where a woman is said to be someone who identifies as a woman, defining a word with the same word.⁸⁶ To define X as something that feels like X tells us exactly nothing. In such a world, science serves as an interesting backstory, but with little direct relevance.

If we are to retain a scientific foothold, there must be a baseline that is rooted in something more concrete than self-perception. Biologically speaking,

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mammalian *design* maps to two sexes, fixed at conception. Intersex conditions are real, but properly understood as medical anomalies, deserving all the care, consideration, and support associated with any other disorder. In the absence of any developmental abnormalities, confusion regarding self-perceived sex may still be genuine, but that does not render self-assessment of an alternate sex *truthful*.

Many people have a sense that they know what a man or a woman is, yet genuinely struggle with a definition or description that encompasses the full range of humanity. There are parallels here with a statement in 1964 by another Supreme Court Justice, Potter Stewart, when he acknowledged difficulty in precisely identifying obscenity (porn), yet added, "I know it when I see it."⁸⁷ Abigail Favale offers assistance with at least the female half of the equation, saying a woman is "the kind of human being whose whole body is organized around the potential to gestate new life."⁸⁸ Note that her definition does not exclude those who are infertile or with developmental imperfections, as the focus is on a biological framework built around a conceptual functionality, not an individual's ability to fully realize that function.

The Image of God

All humans possess a spirit or nature that is called to serve, love, and commune with God. All are made in the image of God, with all the inherent privileges and responsibilities that entails. This is not the same, however, as saying that our physical condition is perfect—that there are no genuine birth defects or other ailments. Most Christians will say that God does not make mistakes, in the sense of something slipping past God's attention, yet they will also acknowledge aberrant conditions at birth or later in life that require medical attention. There is an accepted tension that God is in control of his creation, yet allows imperfections, and then calls upon his people to intervene in addressing those imperfections as they are able.

A simple example is the child born with a cleft lip. A glitch in the process of fetal development produces a face with a split upper lip, often with an offset between the two sides. Christians may acknowledge God's sovereignty in the birth of this child, while also affirming God's call to intervene and repair. In more complex examples, repair may not be possible. For most of human history, healing someone from a condition such as hemophilia or sickle cell anemia was beyond the realm of medical science. Living with

such a condition does not diminish a person's value or undermine their status as bearing the image of God, but we do no service to anyone by reclassifying the condition as simply on a spectrum of normal human development.

Summary

The intention of many of those who advocate for human sex transition is undoubtedly a desire to help those experiencing emotional pain and to elevate those who have been historically marginalized. But good intention isolated from sound reasoning increases the potential for greater harm. Examples drawn from nature by PCN and others to affirm malleable human sex, in my assessment, are based on a series of logical fallacies:

1. *False dichotomy*: Terms unnecessarily defined to present a false either/or choice (*essential or contingent sex*)

If a binary sex model for humans is defined as all humans have a clear sex, intersex conditions challenge the model. But that is not the only option. If assessed based on human *design*, with recognition that defects exist for every aspect of human physical development, the binary model holds.

2. *False equivalence*: Erroneously equating two things that bear only superficial similarity

- a. *mammals and nonmammals*

Citing examples of contingent sex in nonmammals as an argument for contingent sex in mammals is not logical if mammals have no biological capacity to shift from one functional sex to another.

- b. *normal and anomalous fetal development*

The existence of anomalies in nature (e.g., intersex conditions) is illogically conflated with how nature is designed to function (binary sex in mammals).

- c. *biological mistakes and human worth*

Characterizing intersex individuals as a third category of human sex to mitigate characterizing individuals as "mistakes" conflates *condition* and *worth*. One may have any number of medical conditions resulting from biological miscues without being devalued as a human being. A condition resulting from a biological mistake does not equate to a person *being* a mistake. Further, removing the language of biological error complicates our ability to diagnose and treat ailments.

3. *Category mistake*: Grouping entities into a single category based on overlapping traits that ignore vital differences (*minimal sexual dimorphism in humans*)

Claims that human males and females exhibit minimal sexual dimorphism based on overlapping characteristics (sufficient to be considered interchangeable) must downplay the growing body of medical studies detailing significant sexual dimorphism in every organ and function of the body, down to the cellular level. No post-gestational pathways exist to morph one sex into the other.

4. *Is-ought fallacy*: In ethics, one cannot logically derive what ought to be simply from what is observed

Examples of contingent sex in the animal kingdom are cited as justification for contingent (and fluid) sex in humans. What is observed, however, poorly constrains what ought to be, as is demonstrated by expanding the list of observations. If examples from nature serve as a foundation for what should be considered normal for humans, many human behaviors or identities incompatible with Christian ethical principles can be affirmed.

5. *Conceptual-shift fallacy*: Building an argument with a stated objective, but basing the conclusion on a different argument

PCN and others build an argument around the science of contingent sex from the animal kingdom and variable fetal development in humans to argue for accepting contingent and fluid sex in humans. But in affirming human sex transitions, the argument switches from science to hypothetical/philosophical ramps from one developmental pathway to another—pathways that do not biologically exist.

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