



How Many Angels Can Dance on the Head of a Pin?

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There is still a debate on whether Pluto is a planet, a dwarf planet, or just a Kuiper Belt object (<https://www.space.com/pluto-problem-time-to-rethink-definition-of-a-planet>). At one time, we thought Pluto was a full-fledged planet, but “newer” insights into what attributes a planet must possess led to Pluto’s demotion. We once thought that only planets could have moons (Pluto has five moons), but now we accept that dwarf planets can have moons. There is still a debate about whether moons can have moons (submoons) though moons apparently can have rings (like Saturn). So, the debate about what a planet really is continues.

Of course, there is no debate that Pluto is an object in our solar system that orbits the Sun. What has changed over time is how we define “things.” Many scientists and lay individuals take pleasure in redefining scientific concepts and then ignore the fallout from the implications of their new definitions.

It was once believed that the Earth was the center of the universe (geocentrism), but slowly science found heliocentrism (the Sun was the center of our solar system) was a better explanation for the phenomena observed, but voicing that belief was blasphemy. At least one person (Giordano Bruno) was burned at the stake for stating that and Galileo was condemned for it. So, we should not underestimate the power of some beliefs, especially when supported by governments and religious dogma, despite the scientific “facts.”

In sexology, sex (in the male–female sense, not the physical act) usually describes the physical state of being a man (male), a woman (female), or a mix of the two (intersex), such as the sex chromosomes, gonads, sex hormones, and internal and external genitalia. Gender is usually used to describe the social, psychological, cultural, and behavioral aspects of something as masculine, feminine, neuter, or a mix of both. Over time, gender can change, discomfort with one’s gender

(gender dysphoria) can lead to changing one’s professed gender, and that can lead to alterations in the individual’s sex (manipulating one’s hormones, surgical removal of some sex organs, and the surgical modification of other organs) to help the individual function in their “new” gender.

Unfortunately, even among sexologists, who should know better, the terms are often misused. So having a penis is an attribute of being a man (male), being a “prick” is associated with acting badly in a stereotypically masculine way. Having a clitoris is an attribute of being a woman (female), being a “cunt” is associated with acting badly in a stereotypically feminine way. Biology is never that neat, so not having a penis or a clitoris is a sign of trauma, a surgical misadventure, or a biological mishap. Having a micropenis or clitoromegaly may be a sign of abnormal hormones/receptors or a genetic disorder. According to the definitions above, it is incorrect to say that a clitoris is feminine, but nurturance may be a feminine behavior trait that is usually present in varying degrees in both men and women.

Currently, there is a debate in sexology and the world about how many sexes and/or genders there are. There is concern when someone wears a t-shirt that says “There Are Only Two Genders” because it may make others feel uncomfortable. I wonder if someone wore a t-shirt that said “The Earth Is Flat” would make others uncomfortable; after all, someone could fall off the edge. Should we treat the discomfort of individuals who think there are only two genders, those who think there are more than two genders, those who think the world is spherical, and those who think the world is flat the same? It is an issue of perspective, though in a real sense why does anyone care?

Depending on the choice of definition used, it is not clear if there are two or more sexes/genders. Scientists, at least I hope we are scientists, can set about to test the outcomes of these conjectures. Hopefully, scientists will somehow come to a consensus and set the record straight, until we find the exception (e.g., there are no naturally purple cats until we find a naturally purple cat). The search for truth is like that. So, we search for phenotypic “men” with XX chromosomes (XX + SRY chromosome patterns and even find some

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XX-SRY males) (<https://medlineplus.gov/genetics/condition/46xx-testicular-difference-of-sex-development/>). Similarly, we search for phenotypic women with XY chromosomes, individuals with Androgen Insensitivity Syndrome (Batista et al., 2018) and Swyer syndrome (King & Conway, 2014). Sometimes we even find individuals with 5 alpha-reductase deficiencies, who are “mistaken” as female at birth but masculinize during puberty (Imperato-McGinley et al., 1979), some of whom decide to transition from female to male.

In the Trumpian era, it is a little bit different, because the ability to argue the point is being artificially constrained. Data that suggest that there are more than two sexes/genders are being erased, covered up, and impugned to sinister motives. Have not you heard that more than two gender/sex proponents are cutting off the penises of little boys (<https://sex-matters.org/posts/healthcare/wpath-evidence-on-trial/>); to date, we cannot find a case of a physician advocating this or a minor that underwent the procedure due to gender dysphoria. It is interesting, at least to me, that no one has discussed the clitoridectomies performed on little girls. One reason why they are performed allegedly is to make the girl more feminine (not interested in sex, a supposedly feminine trait) rather than more female (The reasons given for FGM, 1998).

The last complication, at least for now, is identity. Someone can say I identify as a vegan, a person who does not eat animal products. The fact that this person had a steak dinner last night may not change their personal identity as a vegan, but it usually outrages other vegans. Somehow, we have lost the ability to define ourselves and others are now in charge of defining who we are.

Identity be damned, the decision that someone is male or female is left to the poor obstetrician who declares (“assigns”) the infant as male or female while caring for both the newborn and the mother. This appears to be an immutable decision. Physicians are somehow imbued with the mystical knowledge of how to direct the life of this tiny human. That said, science is not very good at finding sex chromosome abnormalities in general (Viuff et al., 2015) and individuals with these variations are not obvious to their physicians, partners, friends, or colleagues (Davis et al., 2024a, 2024b). To be fair, classifications were based on chromosomal sex, all the men had at least one Y chromosome technically making them male, and all the women were devoid of a Y chromosome technically making them all female. It does not appear that these studies investigated the frequency of XY women or XX men, so that is still an open question.

Gender

Gender appears to be dealt with differently. There are more masculine men and less masculine men, more feminine women and less feminine women, by whatever traits you are

“assigning” as masculine or feminine. There are both men and women who score high on both masculinity and femininity and those who score low on both. Some men and women score high on some aspects of masculinity and low on others. To confuse the issues even more, individuals with same mix of masculinity and femininity traits will be judged differently whether they were assigned male or female at birth. Some cisgender individuals feel that their physical attributes do not fit with their own image of their gender and seek out medical/surgical solutions. Although we do not categorize this as gender dysphoria, who knows what the future holds?

So, the answer to the title question depends a bit on how you define angels, dance, the head of a pin, and who is doing the defining. Different definitions will give you different answers. The same is true of the real questions on which this commentary is focused: How many genders and/or sexes are there?

Over the years in the fight for gender and sex equality, the terms gender and sex have been conflated, confused, and clouded by politics, and the definitions fought over. It gets more complicated quickly. The presence of a beard (physical) is a sign of being a man, but there are plenty of women with facial hair (hirsutism). No guide categorizes the number of hair follicles per square centimeter of facial skin, thickness, color, texture, etc., to distinguish the male facial hair (a beard) from the female facial hair. There clearly are people who feel strongly about their own “beard” or whether their partner has a beard. The number of products available to treat (remove, color, clean, cultivate, etc.) facial hair suggests that facial hair dysphoria is an issue for some humans.

The Bottom Line (Double Entendre Meant)

If a person says my name is Joe, but please call me Red, it seems reasonable and polite to call that person Red. Those that insist on calling that individual Joe demonstrate a denial of that person’s self-identity and make it likely that they are boors (a rude person who does not consider other people’s feelings; <https://dictionary.cambridge.org/dictionary/english/boor>). Insisting on using nonpreferred pronouns or labels will not change the other person or their gender identity, though it will probably infuriate them. If others consistently misgender you, then possibly the best response is to misgender them back to demonstrate how it feels. Calling the current president Madame President conveys the same contempt that the president has shown toward gender dysphoric Americans (<https://www.axios.com/2025/02/05/anti-trans-executive-orders-trump>).

Insisting that everyone honor your request to use specific pronouns or asking them which pronouns they want you to use when referring to them is likely to infuriate many of them as well. Using gender neutral language until you are aware of

the individual's preferences may sensitize all of us on how we make assumptions about someone's gender.

In a free society, people can believe that there are only two genders or that there are more than two. They may change their minds about what they believe and even change them again, with the only caveat being that you should not impose your beliefs on others. It is also important to remember that the vast majority of us accept our assignment as male or female (sex). Some choose to enhance their masculine gender characteristics and others their feminine characteristics. The overwhelming majority of these individuals are cisgender.

It harkens back to the days when Americans enslaved people because of the color of their skin (Blacks), denied citizenship to people born here (Native Americans), imprisoned people for their ancestry (Japanese), or denied people the right to vote or enter certain professions (women). Unfortunately, there are many more examples of how the USA and other countries have not been the bellwether of human rights.

I know someone who identifies as nonbinary because e¹ (an XY person with a penis) rejects the stereotypical masculine and feminine gender roles and has adopted gender neutral pronouns. E also became an independent politically, after rejecting the standard positions of both Republicans and Democrats, which is apparently common now (<https://www.pewresearch.org/politics/2022/08/09/2-traits-of-the-parties-trump-and-the-gop/>). It seems like living in a free society requires that you grant those you disagree with the right to live their lives the way they want not the way you think they should. If you disagree, then there is a question about your commitment to living in a free society.

I do not think that everyone must agree there are only two genders or some other number. I do not think that you have to support that person's self-identity as a steak eating vegan, but you should not insist I support your definition of their identity either. I have a warm spot in my heart for science, but think that everyone should find their own creed and not insist that I support theirs. How many angels can dance on the head of a pin is a metaphor for a question without any practical value and whose answers hold no intellectual consequence, except to demonstrate how cruel some humans can be to other humans who hold a different point of view or identity.

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¹ Switching to nongendered pronouns (Moser & Devereux, 2016).