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MODELLING SEX/GENDER

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People often assume that everyone can be divided by sex/gender (that is, by physical and social characteristics having to do with maleness and femaleness) into two tidy categories: male *and* female*. Careful thought, however, leads us to reject that simple 'binary' picture, since not all people fall precisely into one group or the other. But if we do not think of sex/gender in terms of those two categories, how else might we think of it? Here I consider four distinct models; each model correctly captures some features of sex/gender, and so each is appropriate in some contexts. But the first three models are inadequate when tough questions arise, like whether trans women should be admitted as students at a women's college or when it is appropriate for intersex athletes to compete in women's athletic events. ('Trans' refers to the wide range of people who have an atypical gender identity for someone of their birth-assigned sex, and 'intersex' refers to people whose bodies naturally develop with markedly different physical sex characteristics than are paradigmatic of either men or women.) Such questions of inclusion and exclusion matter enormously to the people whose lives are affected by them, but ordinary notions of sex/gender offer few answers. The fourth model I describe is especially designed to make those hard decisions easier by providing a process to clarify what matters.*

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Method: Models

Philosophers usually approach sex/gender through metaphysics, semantics, or conceptual analysis. Here I am doing none of those things. I will not say what I think men and women really are (metaphysics), what words like 'woman' and 'man' really mean (semantics), or what the concepts *woman* and *man* necessarily involve (conceptual analysis). A model of sex/gender, in my intended sense of 'model', does not aim to get at the true nature of sex/gender in any of those ways, but only to represent it well for some purpose.

I take a model of something to be a purpose-oriented representation of some features of that thing. That is, a model is built for a purpose and is simpler than reality; it represents only the most important features and elides the others, where what counts as important depends upon the use the model will be put to. For example, the 'Visible Man' toy is a model of the large bones and major organs of a typical man, intended to provide a basic introduction to human anatomy. A highly realistic model would be a poorer introduction since too much detail is confusing for a beginner. Models are not intended to capture every feature of the thing modeled, but are by their nature somewhat distorting. Different models of something, with different distortions, may each be most useful for different purposes. Simple anatomical models are best for beginners, more complex ones for more advanced students. And a simple model of the human nervous system might omit important details about the vascular system, while a simple model of the vascular system leaves out key details about the nervous system.

Conceptual analysis is in some ways like modeling, but there are important differences. My project of modeling shares the pragmatic spirit of some revisionary sorts of conceptual analysis: models are tailored to relevant concerns and purposes, as concepts can be. Modeling differs, though, in that even revisionary conceptual analysis

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presumes there is a right answer about what a concept does or should include, based on the most typical or most important use of that concept. A model, by contrast, is like a framework for thinking about and using a concept. Models are better or worse only relative to some situation; there is no *best* model across all contexts and purposes. In working with complex, contested concepts like sex/gender it is a mistake to ignore contextual variation or the possibility of more than one 'right answer' about concepts or the uses we put them to. Models do not ask us to.

What follows is both an account of some alternative models of sex/gender categories and also a demonstration of how modeling can shed light on complex phenomena in a different way than metaphysical, semantic, or conceptual analyses do. I describe four models of sex/gender and evaluate them with respect to how well they address a few key challenges.

Three Extant Models of Sex/Gender

Though the project of modeling sex/gender has not been explicitly undertaken before, I think sex/gender discourse in the West employs certain models implicitly. Of the three in regular use, the most common, by far, is the 'binary' model. It represents people as classifiable into two exclusive and exhaustive sex/gender categories: men and women. It characterizes each category by its typical physical and social features, which all category members are presumed to share. In its favour, the binary model represents some important differences among humans, it is very simple, and it is widely accepted and used throughout much of the world today. Its simplicity comes at the cost of getting the details right, though, in ways that have grave consequences. It brutally excludes trans, intersex, and androgynous people, who do not have all the typical physical and social features of men or all the typical features of women. For everyone, it encourages the use of disfiguring

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stereotypes: when there is no room in a model for people who are in between, it is harder to see that most people are not wholly 'masculine' or 'feminine'. That lack of nuance can warp your self-conception in ways that interfere with your potential, and it can stop you from seeing others as they really are. The assumption that people fit neatly into binary sex/gender categories is harmful to all those who do not fit, and it is a barrier to understanding one another.

A second model treats sex/gender as a continuous spectrum between the poles of male and female, and thus as non-binary. People may land anywhere between the poles, with infinitely many possible points on the spectrum. So the model represents traditional notions of masculinity and femininity (the poles), and variation in degree of masculinity or femininity (the continuum between the poles). It is increasingly common for sexual *orientation* to be modeled by a spectrum, so when we search for a non-binary model of sex/gender, we naturally seize upon the model already used to represent non-binary sexual orientation. This 'spectrum' model of sex/gender is an improvement over the binary model in that it broadens the possibilities for our self-conceptions and our conceptions of others. It captures the idea of an 'in between', and so it represents the gender identities of more people. And it is grounded in the binary model, so it is familiar and easy to explain.

The third model, call it 'discrete categories', is also based on the binary model, but instead of a continuum between two 'poles', it represents sex/gender as consisting of more than two categories, each of which is sharply defined. The simplest version proposes just three categories: male, female, and other. This model preserves the useful grouping of people into well-defined sex/gender categories, unlike the spectrum model. It also has more nuance than the binary model, because it has more categories. Another advantage is that, rather than thinking of sex/gender as a continuum along a single dimension, this model can be used to represent the way sex/gender varies

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in different respects. For example, a person with a very feminine appearance may engage mainly in stereotypically masculine activities. It seems nonsensical to ask where on 'the spectrum' such a person is, relative to someone with stereotypically feminine activities and a masculine appearance. The discrete categories model can handle that case either by lumping both together as 'in between' or by creating additional categories to accommodate different combinations of sex/gender characteristics.

These models could be evaluated in a number of ways, but two features of sex/gender seem especially important. First, whether someone is a man or a woman is *ambiguous*: there are different definitions of the relevant terms. For example, sometimes 'man' refers to those people who have typical male reproductive organs, but sometimes it refers instead to those people who function socially as men. The definitions pick out many of the same people, but they use completely different criteria to evaluate who is a man. Second, some of those different sex/gender criteria are also *vague*, in the sense that they vary continuously, without a sharp boundary between categories. A standard example of vagueness is the word 'bald'. There is no single hair that makes the difference between not being bald and being bald; the transition is gradual. Similarly, there is no nanolitre of testosterone that makes the difference between being a woman and being a man. Many criteria relevant to sex/gender categories are vague.

Considering those two important features of sex/gender, the spectrum model succeeds in representing the *vagueness* of sex/gender categories. Unlike the binary model, it acknowledges that some people do not fit neatly within either of the categories *male* or *female*, instead proposing a spectrum of possibilities without sharp boundaries between categories. The discrete categories model captures instead the *ambiguity* of sex/gender categories: no single feature, and so no single continuum, alone determines who is a man or who is a woman. Instead, different features can be used to divide people into sex/gender

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categories. Because the model represents the resulting categories as sharply divided, though, it does not capture vagueness like the spectrum model does. The binary model represents neither the vagueness nor the ambiguity of sex/gender.

The 'Many Strands' Model of Sex/Gender

My model is intended to capture both the vagueness and the ambiguity of sex/gender, with a moderate increase in complexity. The key change is to represent sex/gender as made up of several partly independent criteria, some of which are continuous. As a start, consider these features:

- Primary sex characteristics
- Secondary sex characteristics
- Gender identity
- Gender performance
- Gender attribution

There are some obvious ways we may need to adjust that list – dividing broad features into their narrower components, for example – but it is a start. Now visualize each feature as a horizontal line, with male on the left and female on the right. Each person's sex/gender is made up of multiple lines. A person may find themselves at the left end of one line, at the right end of another, and in the middle of a third.

Now imagine each feature as one thread, all of which are braided together into a person's sex/gender. For example, suppose we represent *waist-to-hip ratio* with yellow thread. If the average male waist-to-hip ratio is X and the average female ratio is Y, we can represent X with light yellow thread, Y with dark yellow thread, and the possibilities in the middle with all the various shades of medium yellow thread. There are infinitely many possibilities, and infinitely many shades of yellow. Then suppose we represent *style*

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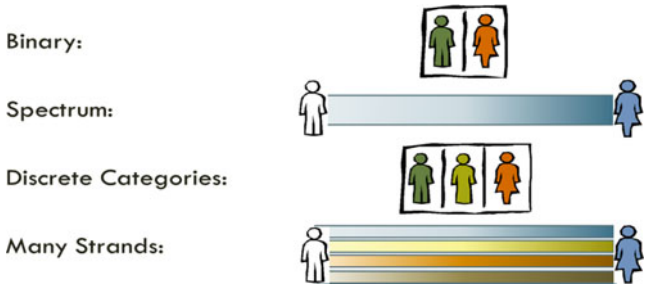
of clothes with green thread: light green for very masculine clothes, dark green for very feminine clothes, and medium greens for a mixed or androgynous wardrobe. And take red thread to stand in for *regular activities* (e.g. your job, your hobbies, or your household roles): light pink for masculine activities, dark red for feminine activities, and medium pinks and reds for mixes of stereotypically gendered activities. With enough differently coloured threads, you could use the resulting braid to represent much of the complexity of your sex/gender.

Here is a way to summarize the four models visually:



This 'many strands' model represents the vagueness of sex/gender, like the spectrum model, by including continua from masculine to feminine. It also represents the ambiguity of sex/gender, like the discrete categories model, by including multiple independent criteria of masculinity and femininity. In addition to capturing vagueness and ambiguity, the many strands model is also flexible enough to be useful in different contexts. For most purposes, after all, the only relevant 'strand' is a person's own gender identity, although occasionally, say, for medical research, sex chromosomes might be key, or hormone levels. In social contexts, the relevance of various strands is always in flux. The many strands model accommodates change by the addition of new strands and removal of old strands, as circumstances require. Also, each strand can be weighted more or less heavily (imagine a thicker red thread and a thinner blue one), or changed from discrete to continuous (instead of

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just four shades of red, you can use infinitely many to represent a feature, or vice versa). In that way, the many strands model can accommodate different contemporary cultures and purposes as well as future beliefs about sex/gender categorization. Interestingly, it can also 'accommodate' the other three models. For example, you can replicate the binary model in the many strands model by including only the blue strand and only two shades of blue.

Those structural features of the many strands model are what make it so useful for clarifying and supporting different gender identities. A woman might understand her sex/gender in terms of a certain ineffable sense of self, or she might think of it in terms of a particular set of feminine qualities. These identities rest on different criteria for inclusion in the category *woman*, but both are legitimate ways for someone to understand herself as a woman. Because the many strands model reflects the ambiguity of sex/gender, it can represent those different meanings of 'woman', making explicit what is often murky in our own minds. In that way, it contributes to greater self-understanding and it offers support for diverse gender identities by helping us to communicate them more effectively.

Better communication, like that enabled by the many strands model, can contribute to the resolution of conflict. When people argue about who is really a woman, some social practice is usually behind the disagreement: maybe the issue is who can attend a special event for women (like the Michigan Womyn's Music Festival), or who may use a bathroom that is restricted to women. But we need not discover the correct definition of 'woman', if there is one, in order to address these practical questions. We only need to isolate the legitimate concerns underlying the disagreement, and judge which side has the better claim. I say, 'only', but this is obviously still a hard task. The many strands model is no substitute for good judgement, but it helps us clarify what is at stake by giving us a way to represent the sex/gender features relevant to each side's concerns, and the relative importance of each feature to

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the question at hand. So we can use the many strands model to develop a meaning of 'woman' for a particular context, to solve a particular problem. When we set aside questions of absolute truth and consistency across contexts, it is easier to find common ground.

Uses of Sex/Gender Models

The many strands model better represents the complexity of sex/gender than the others, but it is harder to use. So we might prefer the other models in certain contexts. Even the binary model may be adequate sometimes, such as when sex/gender attributions are needed quickly and very little depends upon them. For example, suppose you want to know how many men and women come into your store on an average weekday for the purpose of better directing your advertising. You might conceptualize sex/gender as binary, categorizing your customers as either men or women on the basis of their appearance. Such a use of the binary model is relatively unobjectionable because nothing much depends upon it; it is just an easy way to get a rough estimate.

The spectrum model, by comparison, is a good choice when only one aspect of sex/gender is relevant, and well-defined categories are not needed. That is, it is a good model when the vagueness of sex/gender is what you need to capture. For example, on the first day of class, an instructor might ask her students to introduce themselves by saying their names and what gender pronouns they prefer, explaining her request by saying that people are not all strictly 'he' or 'she' – people can fall anywhere on 'the spectrum' between those identities. Someone who identifies as neither male nor female might prefer the gender-neutral pronouns they/them/theirs, or ze/hir/hirs. The ambiguity of sex/gender is unimportant here since the only relevant factor, for the purpose of creating an inclusive classroom, is gender identity. Well-defined categories are

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also unimportant, since the goal of using preferred pronouns is to respect each student, not to 'correctly' categorize students. The spectrum model is good enough for this situation since it does capture the vagueness of sex/gender, and it might be preferable to the many strands model because it is simple enough to explain quickly on the first day of class.

The discrete categories model is useful when well-defined sex/gender categories are needed and there are reasons to downplay their fluidity. For example, in reporting research that categorizes people by sex/gender you probably should say something about how you defined sex/gender for the purpose of the research you completed. Even if the many strands model informed your research design, a simpler explanation may be preferable when reporting your results. To take a specific case, suppose you want to evaluate how well your school academically supports its students, and you plan to include a section breaking down the results by sub-category, including sex/gender. Although the point of the research is not to study sex/gender directly, it requires well-defined categories. You might begin the project by specifying sex/gender categories using the many strands model, so that your categories suit the context of your research. But you should probably *report* your results in terms of the simpler discrete categories model to keep the focus on the results themselves rather than distracting your audience with too much information about how the categories were defined.

The many strands model is useful when you must categorize others by sex/gender and the consequences are serious. When it really matters, the increased complexity of the many strands model is worth it for its accuracy and flexibility. For example, suppose you must help decide whether your women's college should admit trans women as students. To apply the many strands model to the question, you first decide which aspects of sex/gender are relevant and how heavily each should be weighted. For example, some of the features you might consider are

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whether an applicant identifies as a woman, whether she has been socialized as a woman, and whether gender discrimination is likely to interfere with her education. Once you have ranked people on those criteria, you need only decide where to draw the line between 'women' and 'non-women' for the purpose of admission. Your official policy statement can include a relatively straightforward explanation of the required criteria: these three features count, with this one most heavily weighted in our considerations.

The requirement can be made even more explicit, if needed, by using this formula: $(w_1 \text{ x } d_1) + (w_2 \text{ x } d_2) + \ldots (w_n \text{ x } d_n)$, where d_i is how closely someone conforms to a certain sex/gender-determining criterion and w_i is how much the criterion is weighted. Suppose we use the three features I mentioned above. We might think that identifying as a woman is much more important than the others, and so weight the features like this: $(8 \text{ x } d_1) + (3 \text{ x } d_2) + (3 \text{ x } d_3)$. The values for d_1 – d_3 would be found by assigning a higher number to someone who more completely or consistently has the feature in question. Imagine someone who identifies strongly as a woman, was not socialized as a woman until recently, and is likely to experience gender discrimination in college. Here is how her 'score' might be calculated:

$$(8 \times 5) + (3 \times 1) + (3 \times 5) = 58$$

If a formula like that one is used, the college's official policy might say what minimum score is required to qualify for admission. Potential applicants could then determine in advance whether they qualify.

In sum, the key advantages of the many strands model are its accuracy and flexibility. Its accuracy comes from its representation of the ambiguity and vagueness of sex/gender: it can model the independent variation of as many sex/gender features as needed, and it can model them as varying continuously. It is flexible in that the features of sex/gender it represents or emphasizes change in response to

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circumstances. Since the model provides a general structure without insisting upon particular features as essential, it can be used across times and cultures, it is sensitive to new research, and it can be tailored to a particular circumstance. Unlike analyses of the metaphysics, semantics, or concepts of sex/gender, modelling does not answer questions about the essential features of men and women. But we do not need those answers before settling practical questions about sex/gender – modeling is a useful tool right now.

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Further Reading

For uses of the spectrum model of sex/gender, see: Claire Ainsworth. 'Sex Redefined', *Nature* 518 (2015), 288–91, Audrey Stirnitzke, 'Transsexuality, Marriage, and the Myth of True Sex', *Arizona Law Review* 53.1 (2011), 285–319.

For uses of the discrete categories model, see:
Sandra Lipsitz Bem, 'Dismantling Gender Polarization and compulsory heterosexuality: Should we turn the Volume Down or Up?', *The Journal of Sex Research* 32.4 (1995), 329–34.
Anne Fausto-Sterling, 'The five sexes: Why Male and Female are not Enough', *The Sciences*, March/April (1993), 20–5.

Another sex/gender model, particularly well-suited to self-reflection, is:
Sam Killermann, *The Social Justice Advocate's Handbook: A Guide to Gender* (Austin, TX: Impetus Books, 2013). Or for a quick look at his 'Genderbread Person', see his website: itspronouncedmetrosexual.com.

For a philosophical discussion of how the binary model is imposed upon intersex infants, see:
Stephanie Kapusta, 'Intersex Diagnostics and Prognostics: Imposing Sex-Predicate Determinacy', *Topoi* (2015): http://link.springer.com/article/10.1007/s11245-015-9354-z#.

For more on modelling as distinct from conceptual analysis: Sally Haslanger distinguishes three kinds of conceptual analysis. The most revisionary sort, 'ameliorative analysis', shapes a concept to its typical or most important purpose. This is pragmatic like modelling, but it leaves us with a single, context-invariant concept. See: Sally Haslanger, 'What Good are our Intuitions: Philosophical Analysis and Social Kinds', *Proceedings of the Aristotelian Society*, supplementary volume 80.1 (2000), 89–118.

For more information about how women's colleges are actually handling the question of who counts as a woman for the purpose of admission, see these sources:

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http://www.nytimes.com/2014/10/19/magazine/when-women-become-men-at-wellesley-college.html

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