A Multidimensional Model of Biological Sex

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

I understand that my thesis may be made electronically available to the public.

Abstract

This dissertation is about biological sex and how we ought to make sense of it. By *biological sex* I mean those elements of an individual's body that are involved in reproduction of the individual's species; by *make sense of it* I mean the way in which the occurrence of these elements and their interactions are conceptualized in our minds. Given certain things that are known about sex and reproduction, I argue in this dissertation that sex, maleness, and femaleness ought to be conceptualized in a specific way: this specific way is what I call *the multidimensional model of sex*.

My argument challenges what I call *the folk understanding of biological sex*, which is (generally speaking) the understanding that most people in most places have about what makes a person male or female. This understanding, I argue, takes the concepts MALE and FEMALE to be logically opposed and atomistic, and constitutive of categories with homogeneous members. I explore three important facts that challenge this understanding: 1) the emphasis on continuity within biological thought, 2) the understanding of sex differences within biology, and 3) the occurrence of intersexuality in human beings.

Some authors have already proposed continuum-based understandings of SEX as a replacement for the folk understanding. I identify and discuss three of these: 1) the basic continuum model (Fausto-Sterling 1993, 2000; Blackless, et al. 2000; Kessler 1998; Preves 2003; Intersex Society of North America 2011a; Organisation International des Intersexués 2011a), 2) the multiple continua model (Stoltenberg 1989), and 3) the hybrid model (Stein 2001; Dreger 1998). Inherent to different degrees within each of these models is the belief that maleness and femaleness are somehow conceptually opposite (which is a belief also shared by the folk understanding). This belief, I argue,

is not borne out in nature, as demonstrated in part by the occurrence of intersexuality in the species *Homo sapiens*, and the occurrence of hermaphroditism in other species. These occurrences, I argue, suggest another way to make sense of sex.

The model of sex that I present is inspired by the occurrence of intersexuality and hermaphroditism, and also by Sandra Bem's (1974) work on the concept ANDROGYNY. Bem reconceptualized masculinity and femininity as dimensions of psychological androgyny. I argue that the concepts MALE and FEMALE, and thus BIOLOGICAL SEX, can be understood in a similar way. I propose a multidimensional model of SEX that includes the concepts MALE and FEMALE as intersecting continua that create a space in which the separate features of an individual's sex are each individually located.

The dissertation concludes by discussing the moral implications of the multidimensional model, as some of our judgments about the rightness or wrongness of a person's actions are related to our understanding of that person's sex. But if the words *male* and *female* come to refer to individual parts of the body and not whole people (as I argue they would, if the multidimensional model were adopted), how would our ideas about the moral acceptability of certain actions and practices change? By examining this general question, I show that adoption of the multidimensional model of sex is important not just because it offers a more biologically accurate representation of sex: it is also important, I conclude, because there is good reason to think that adopting it could improve the quality of life for many.

Acknowledgements

Thank you to Paul Thagard for continually encouraging me and for seeing importance in what I was doing. Thank you to my committee members for carefully considering my ideas and supporting their development. Thank you to all the professors who introduced me to the ideas I discuss in this dissertation. Thank you to my friends, especially Krystan and Natalie, for listening. Thank you to my Mom, for everything. Thank you to my family for always asking when I would be done. Thank you to Chris for enduring. And thank you to little Bub, for all the times she let me do my work.

Dedication

I dedicate this to Ardeth.

Contents

List of Figures

List of Tables

Chapter 1

Introduction

1.1 Questioning the concept BIOLOGICAL SEX

People generally do not like to hear that they are wrong, especially when they have a great interest in being right. They are also less likely to consider the possibility that they are wrong the more people there are who agree with them. Given these general truths about human behaviour, this dissertation is perhaps taking on a quixotic task.

In this dissertation, I will argue that most people are mistaken about something they really want to be right about, and something most people think they *are* right about: biological sex. I believe, and will argue, that most people are mistaken about what the terms *male* and *female* refer to, and what kind of difference exists between people we call *male* and people we call *female*.

This introduction will provide a brief sketch of the main ideas I will criticize in this dissertation, and the main ideas that I will present in their stead. I will

first describe the three ideas that are at the core of most people's understanding of biological sex. These ideas are very likely to be met with a high level of resistance; to address this, I will provide a few considerations to spur the reader on. I will then briefly describe the particular reconceptualization I will be presenting in this dissertation.

1.2 Three beliefs of the folk understanding

I will argue that the dominant understanding of biological sex, what will be called *the folk understanding of biological sex,* involves three basic beliefs about the categories 'male' and 'female.' These three basic beliefs are: (1) that all males are alike with respect to their maleness, and that all females are alike with respect to their femaleness; (2) that whatever makes a male a male and whatever makes a female a female are each only ever possessed in whole and never just in part; and (3) that the concepts MALE and FEMALE are logically opposed to each other.

The first belief, which I will later refer to as *the belief in group member homogeneity*, has to do with the relationships that the folk understanding takes to exist between group members of the category 'male,' and between group members of the category 'female.' The term *group member* just means those things that belong to a particular group. My car, for example, is a group member of the category 'car;' a leaf on the ground is a group member of the category 'leaf.' When people identify someone as a male, they are identifying that individual as a member of the category 'male.' Anyone identified as a female is identified as a member of the category 'female.' As I will argue in a later chapter, the folk understanding of biological sex takes the group members of the category 'male' to be

identical with respect to the quality that makes them male, and group members of the category 'female' to be identical with respect to the quality that makes them female. These qualities can be referred to as *maleness* and *femaleness*, respectively.

The second belief that I will challenge has to do with the nature of the qualities maleness and femaleness. The folk understanding, I will argue, takes these features to be single, simple things that cannot be disassembled. Because there are no "parts" to these qualities, there is no variation between group members with relation to these parts either: there is no having more or less of whatever makes particular people whichever sex they are. I call these associated commitments *the belief in atomistic structure.*

The third main belief of the folk understanding, the belief in logical opposition, has to do with the particular relationship the folk understanding takes there to exist between the concepts MALE and FEMALE, between the categories 'male' and 'female' and the people regulated by them. With the folk understanding, the information {not female} is contained within the meaning of the word *male*, and the information {not male} is contained within the meaning of the word *female*. The same sort of relationship exists between the concepts INTERSECTING LINES and PARALLEL LINES. People who are familiar with these concepts know that lines that fit in the category 'intersecting lines' are not parallel, and that those that fit in the category 'parallel lines' are not intersecting. The folk understanding, I will argue, takes the same sort of relationship to exist between the concepts MALE and FEMALE. Because of the belief in logical opposition, proponents of the folk understanding believe that people who fit into the category 'male' are not female, and people who fit into the category 'female' are not male.

In this dissertation, I will argue that these three beliefs about biological sex are wrong. Stated negatively, I will be arguing: (1) that all people categorized as 'male' are not identical with respect to their sex; (2) that all people categorized as 'female' are not identical with respect to their sex; (3) that MALENESS and FEMALENESS, represented as intersecting continua, create the foundation for the concept SEX; and (4) that the concepts MALE and FEMALE are mistaken if they contain the information {not female} and {not male}, respectively. Stated positively, I will be arguing: (1) that people within the category 'male' differ from one another in relation to sexual features; (2) that people within the category 'female' differ from one another in relation to sexual features; (3) that what makes people the sex that they are is complex; and (4) that the concepts MALE and FEMALE should be represented as co-constitutive, bisecting continua that form the basic foundation of the concept SEX.

1.3 Why someone who holds the folk understanding should read on

Most people are strongly motivated to resist any suggestion that the folk understanding is flawed. This motivation is understandable, given that if the three beliefs just outlined are doubted (or abandoned), then one must be willing to doubt (or abandon) one's own identity as well. Most people believe that to be a human individual is to be, by logical necessity, a *female* human individual or a *male* human individual; furthermore, most people consistently experience themselves as being *either* a male *or* a female throughout their entire lives. For most people, reconceptualizing sex will require no less than reconceptualizing themselves.

People can dismiss alternative views in a number of ways. One could dismiss a different view of biological sex by claiming that it is motivated by the desire to be controversial or provocative, rather than the desire to be accurate. One could dismiss it by claiming that it is obviously not well-reasoned. One could also dismiss it by saying that it is simply irrelevant to how life is actually lived day-to-day. I am drawing attention to these reactions because within the context of this dissertation they could translate into someone not reading beyond this page. I hope that readers will resist the temptation to dismiss, and can offer two reasons for them to do so.

The first reason is, admittedly, rather cheap: sex, whatever meaning it has, is endlessly interesting. Biological sex, having sex, and sexuality are all bound up together, and despite our wishing otherwise at times, people are interested in it. Has any culture ever tired of discussing, representing, managing, or condemning sex? The curiosity most people have about sex will, I hope, spur people on despite their initial urge to dismiss and reject the ideas I will present herein. Another reason to resist the temptation to dismiss is that what I am saying might not be quite as outlandish as it first sounds. In this dissertation I am not claiming that the concepts SEX, MALE, and FEMALE are meaningless; I am, rather, saying that they have meanings other than those that the folk understanding suggests. I am also not claiming that the concepts MALE and FEMALE cannot help us understand people's bodies; I do argue, however, that they relate to bodies in a different way than the one suggested by the folk understanding.

So what *are* the claims that I am making? The next section will provide an introductory sketch.

1.4 Sex as a concept

What does it mean to speak of the concept SEX? To answer this question I should clarify what I mean by the word *sex* and what I mean by the word *concept*. First, by the word *sex* I mean the sex that people *are*, not the sex that people *have*. My argument focuses upon the concepts SEX, MALE and FEMALE, and the categories related to them, not on the concepts SEXUAL INTERCOURSE, SEXUAL ACTIVITY or SEXUALITY and the categories related to them (i.e., 'heterosexual,' 'homosexual,' 'bisexual,' etc.).

So what do I mean when I say I will be speaking about biological sex as a concept? Gregory L. Murphy (2002) explains in his *Big Book of Concepts* that we use concepts to interpret and manage our experiences of the world in a particular way (1). He writes:

> If we have formed a concept (a mental representation) corresponding to that category (the class of objects in the world), the concept will help us understand and respond appropriately to a new entity in that category. (1)

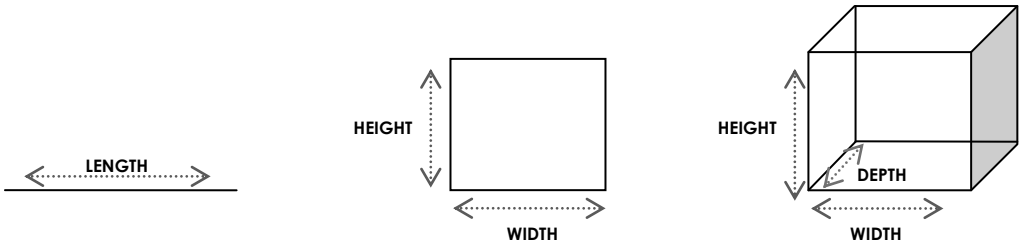
So, when I am speaking about SEX as a concept I am speaking about the representation that exists in people's minds of the sex that exists in people's bodies, and how that representation affects and shapes our interactions with other people.

1.5 How sex can be multidimensional

My argument is fundamentally about how the concept BIOLOGICAL SEX ought to be represented in peoples' minds, and how adopting the reconceptualization I suggest would likely improve interactions between people. An individual's biological sex, I will argue, ought to be

represented as an image created by mapping an individual's sexual features onto the space created by the two intersecting continua $Male_C$ and $Female_C$.

If the suggestion that information should be represented by using shapes and their dimensions seems unfamiliar, it might be worth pausing for a moment to consider that people actually do this quite often. Compare three familiar shapes: a line, a square, and a cube.

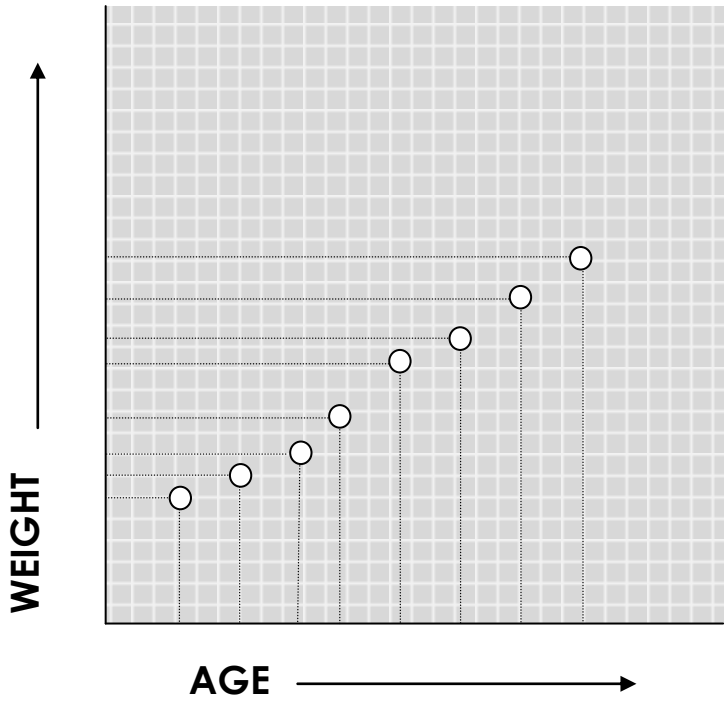


1-1 Three shapes and their dimensions

The three shapes included here (line, square, and cube) are capable of representing different types of information. The more dimensions that a shape has, the more information it can represent.

A line has only one dimension ($Length_D$), a square has two ($Height_D$ and $Width_D$), and a cube has three ($Height_D$, $Width_D$, and $Depth_D$) (see Figure 1-1). Each of these shapes can be used to represent information. A single line is good for representing a single thing, such as the age of a baby. A square shape, because it has two dimensions, provides a good basis for representing the literal *coincidence* of two different kinds of information, such as a baby's age and weight (see Figure 1-2, below). A cube, with its three dimensions, provides the structural basis for the coincidence of three different kinds of information: perhaps the baby's age, weight, *and* height. The more dimensions, the more information that can be represented simultaneously.

By suggesting that biological sex ought to be understood as being multidimensional, I mean that it ought to be understood as referring to the set of coincidences of two different types of information: 1) how male a single feature of an individual's sex is, and 2) how female a single feature of an individual's sex is. The single feature itself will be represented by the coincidence of these two types of information.



1-2 Representation of coincidence of two types of information

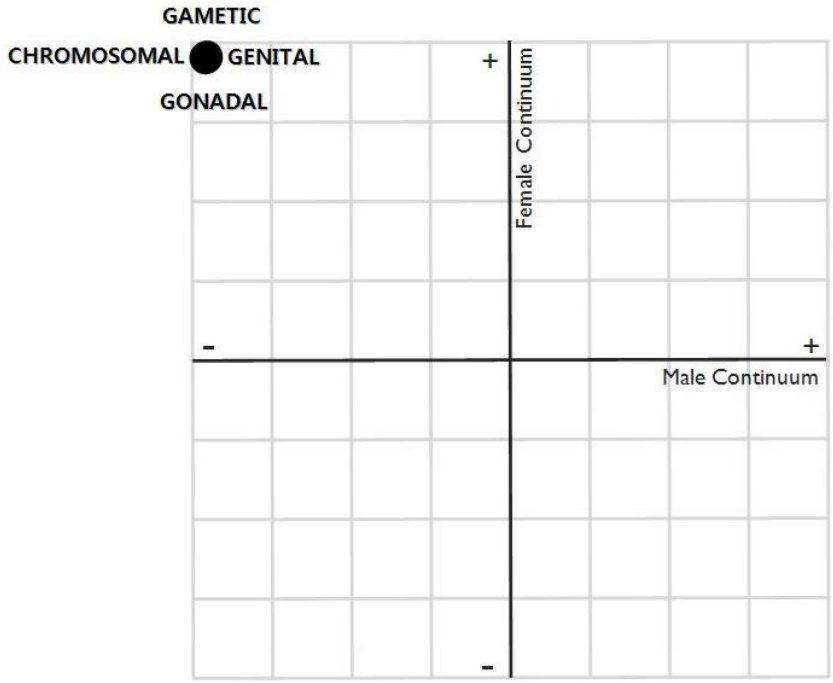
This shape illustrates the coincidence of two types of information using two dimensions (in this case, weight and age).

1.6 Individual sex

Part of my argument will show that an individual's sex is the image created by mapping the relative maleness and femaleness of the components of that individual's sexual system onto the space created by the intersection of $Male_C$ and $Female_C$. Most people are familiar with the existence of different sexual parts, though they might be unfamiliar with speaking of them as "components" of sex. The people identified as males by the folk understanding usually have an XY chromosomal pair, a penis, and testes; people identified as females usually have an XX chromosomal pair, a vagina and vulva, and ovaries. In addition to these physical parts, people identified as males and females usually produce sperm and ova, respectively. The folk understanding overlooks the variation that can occur with these components and instead roughly groups them all together as being either strictly male or strictly female. The multidimensional model I am suggesting considers each of these components individually. The individual's sex can then be conceptualized as the particular grouping created by locating each of these components on the space created by the dimensions $Male_C$ and $Female_C$.

In highly female individuals and highly male individuals, as represented in Figures 1-3 and 1-4 (below), the four elements of biological sex (gonads, external genitalia, chromosomes, and gametes) form a cluster within different areas of the space created by the intersecting continua $Male_C$ and $Female_C$.

In these illustrations (Figures 1-3 & 1-4), the black circles represent the particular expression of the individual's gonads, external genitalia, and chromosomes in terms of both maleness and femaleness. In the case of the first individual (represented in Figure 1-3), each of these four elements are highly female and not male. This person's sex is made up of an XX chromosomal pair, ovaries, and female external genitalia, and the individual



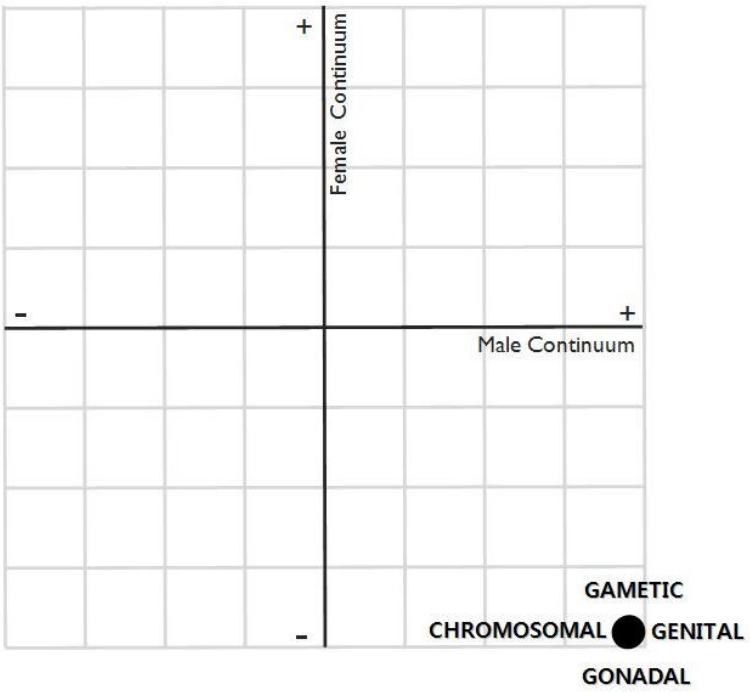
1-3 Representation of prototypical female sex pattern

The components of the individual's sex (gonads, chromosomes, gametes and external genitalia) are mapped on to the multidimensional space created by the intersecting continua $Male_C$ and $Female_C$. Because each component is (1) highly female and (2) not male, this individual's features are each located in the furthest point of the female quadrant.

produces egg cells. The reverse can be seen in the case of the other individual (represented in Figure 1-4), where each of these four elements is highly male and not female. The individual whose sex is represented in Figure 1-4 has an XY chromosomal pair, testes, and male external genitalia, and produces sperm cells. Although it will be discussed later in further detail it must be noted here that these two representations of biological sex are not the only possibilities.

Where exactly each feature is represented in the space will depend on the element itself, and how male and how female it is (in other words, how closely it approximates the prototypical male and the prototypical female versions of

that feature). In most cases, a person's sex will be represented as a group of features in one of two quadrants (either the quadrant representing a combination of maximum maleness and minimum femaleness, or the quadrant representing the combination of minimum maleness and maximum femaleness). There is, however, no guarantee that this will always be the case. Some people, because of the morphology of their sexual anatomy, could require representation in two, three, or all four of the different quadrants, rather than just one.



1-4 Representation of prototypical male sex pattern

As with Figure 3-1, the components of the individual's sex are mapped onto the multidimensional space created by the intersecting continua $Male_C$ and $Female_C$. Since each component of this individual's sex is (1) highly male and (2) not female, they are each located in the further point of the male quadrant.

1.7 Plan of development

The reconceptualization of sex that I am presenting in this dissertation, and which I have just briefly summarized, is obviously in tension with each of the three basic beliefs of the folk understanding of sex. The multidimensional understanding of sex completely subverts the logical opposition and atomism claimed by the folk understanding as it takes maleness and femaleness to be bisecting continua, and a person's sex to be the total composite of individual features located within the space created by the intersection of those continua. The belief in group member homogeneity is challenged as well, as the multidimensional reconceptualization I will present takes the categories 'male' and 'female' to be about components of sex, not whole people.

Given (1) that the multidimensional model is so at odds with the folk understanding, and (2) the fact that almost anyone reading this is likely to be a proponent of the folk understanding, I need to first clarify the precise focus of this argument. To provide this clarity I will first address the concept of GENDER, and the different ways that the relationship between it and the concept SEX have been understood. I will begin here because the difference between these understandings is so great that, if they were left unaddressed, they would become a rich source of confusion and misunderstanding. In Chapter Two I will discuss three perspectives on the relationship between SEX and GENDER. In discussing these different conceptualizations I hope to show that although there is little (if any) cross-perspective agreement about what GENDER is, there is enough agreement about what SEX is to facilitate cross-perspective discussion of this topic. The existence of cross-perspective agreement, I think, means that one can evaluate and discuss the merit of the multidimensional model of SEX no matter what perspective one takes on its relationship to GENDER.

After these clarifications have been made, Chapter Three will provide a detailed presentation of the folk understanding of biological sex, with focus on the three basic beliefs outlined above. In this chapter I will argue that the folk understanding relies on essentialist thinking about sex, meaning that people who espouse this understanding interpret all people categorized as 'male' as sharing some essence of maleness, and all people categorized as 'female' as sharing some essence of femaleness.

Chapter Four presents three challenges to the beliefs of the folk understanding. Two of these challenges stem from biology and focus specifically on the problems with essentialist thinking about sex. These challenges relate to (1) evolutionary theory, and (2) the biological understanding of sex and its emphasis on gamete cells (i.e., egg or sperm cells). The third challenge to the folk understanding stems from the existence of intersexuality, which is the co-presence of male and female sexual parts in a single individual. Each of these challenges, I will argue, suggest that the folk understanding needs to be either revised or replaced.

Chapter Five presents alternatives to the folk understanding that have already been put forward. The public awareness of intersexuality (which some call *disorders of sexual development* and many still refer to as *hermaphroditism*) has greatly increased in the last decade or so, and with it, awareness of the folk understanding's shortcomings.[1] In response to these shortcomings a number of authors have suggested that sex is best understood (at least in part) as a continuum that includes both maleness and femaleness. Chapter Five provides a synopsis of three different versions of this continuum view of sex: (1) the hybrid view (Dreger 1998; Stein 2001), (2) the single continuum view (Fausto-Sterling 1993; Fausto-

[1] I choose to use the words *intersex* or *intersexuality* to refer to these conditions instead of *disorders of sexual development*, for reasons that I outline in Chapter 7.

Sterling 2000; Blackless, et al. 2000), and (3) the multiple continua view (Stoltenberg 1989).

Chapter Six presents the reconceptualization of SEX that I am proposing as an alternative to both the folk understanding and the continuum models that have been suggested as replacements for the folk understanding. The basic features of the multidimensional understanding that have been outlined in this chapter will be fully expanded in Chapter Six.

Chapter Seven explores the moral implications that widespread acceptance of the multidimensional model would be likely to have. Both medical and nonmedical issues are discussed in this chapter, with the general conclusion that whatever reasons one might have to accept the multidimensional model, there is good reason to think that acceptance of this reconceptualization of SEX will make our lives better.

Chapter 2

Sex and Gender

2.1 Introduction

The argument I will present in this dissertation focuses squarely upon the physical, sexual categories of reproduction (i.e., 'sex,' 'male,' and 'female') and the relationships between them. I will not have much to say about social categories related to sex (such as 'man' and 'woman'), nor about social behaviours associated with or expressed by individuals of different sexual types (such as masculinity and femininity). To put it succinctly, my argument is about the concept SEX as it refers to reproductive types; it is not about SEX as an activity, nor is it about the concept GENDER.

The previous sentence will make little to no sense to many people, for many reasons, and without addressing this at the outset, my argument will meet the same fate. Other than the basic agreement that there is some relationship or

other between SEX and GENDER, there are very few (if any) other points of agreement between the various theoretical positions one can take on the connections between these concepts. And there *are* numerous positions one can choose from: one essay, for example, identifies almost thirty different meanings and seven different uses of the word *gender* (Hawkesworth 1997, 650 - 651).

Rich histories of the concept GENDER are available elsewhere (Overall 2003, and Nicholson 1998). In this chapter I will only sketch three positions one can take on the relationship between SEX and GENDER: (1) the earlier conceptualization (found in feminist philosophy), (2) the later conceptualization (also found in feminist philosophy), and (3) the folk conceptualization. Following these presentations, I will argue that the multidimensional model of SEX can and does make sense no matter the general position one takes on SEX and GENDER; to show this, I will provide an argument about conceptual features, disagreement, and communication. This argument will show that people can still have meaningful communication about sex without explicitly speaking about gender, and that they can do so *even if* the participants of that conversation disagree about the connections between the two.

2.2 Three ways to think about sex

2.2.1 Earlier conceptualization: there is sex, and then there is gender

The earlier conceptualization of SEX and GENDER rests on the firm commitment that the two are different things, have different sources, are capable of being thought of and discussed separately, and have different

relationships to human beings. The introduction of these distinctions can, in large part, be attributed to Simone De Beauvoir's (1953) seminal work *The Second Sex*. De Beauvoir's *The Second Sex* provides an analysis of the cultural creation of the concepts WOMANHOOD and FEMININITY and rejects the belief that so-called "feminine" or "womanly" behaviour stems from female biology. Describing the opposite view, *The Second Sex* explains: "Woman? Very simple, say the fanciers of simple formulas: she is a womb, an ovary; she is female – this word is sufficient to define her" (3). De Beauvoir's position is that the answer to what makes a person feminine (i.e., a woman) is itself complex, and cannot be answered simply by referring to that person's biology. Rather than biology, De Beauvoir's work strongly emphasizes the influence of social forces. In what is perhaps one of the most well-known statements in feminist philosophy, de Beauvoir asserts: "One is not born, but rather, becomes a woman" (3).

Commenting upon the influence of de Beauvoir's ideas, Marilyn Friedman (1996) states "[e]arly in the contemporary feminist renaissance, gender was differentiated from sex and much fruitful work ensued" (78). De Beauvoir's ideas were so appealing because they suggest greater possibility and flexibility for human existence than a view that takes people's identity and behaviour to be determined by their bodies. Friedman describes the basic features of sex and gender that are characteristic of this conceptualization:

> "[s]ex" is the biologically given basis of sex identity and sexuality. Biological sex comprises external and internal genital anatomy, anatomically secondary sex-characteristics, and certain hormonal and chromosomal combinations. The words "female" and "male" identify persons in terms of their biologically sexed natures. Gender, by contrast, encompasses traits and behaviours which mark, and are traditionally thought to express, those biological givens in cultural practice. Gender includes

> psychological qualities, intellectual traits, social roles, grooming styles, and other modes of self-presentation. The words "feminine" and "masculine" identify persons in terms of their gender. (78)

Linda Nicholson (1998) also describes sex and gender in terms of their different levels of malleability (289). Generally speaking, it was thought that people could alter gender-related aspects of themselves; they could not, however, change aspects of their sex (289).

The division between SEX and GENDER (which could really be described as the recognition of GENDER itself) highlighted the ways that people with female anatomy are *made* or *encouraged* to be feminine, and the ways that people with male anatomy are *made* or *encouraged* to be masculine. To emphasize this point, both Frye (1983b) and Greer (1971) questioned the assumed naturalness of attaining any gender role at all, including those considered sex-appropriate, by comparing the process with gender acquisitions considered to be sex-inappropriate. Greer wrote that "[t]he 'normal' sex roles that we learn to play from our infancy are no more natural than the antics of a transvestite" (29). On the same theme, Frye stated that "nobody goes about in full public view as thoroughly decked out in butch and femme drag as respectable heterosexuals when they are dressed up to go out in the evening, or to go to church, or to go to the office" (29). Frye (1983b) explains that through gender (and not through or because of the anatomy of our bodies) we create "different styles of gait, gesture, posture, speech, humor, taste and even of perception, interest and attention that we learn as we grow up to be women or to be men" (23-24).

By emphasizing the constructed nature of gender, De Beauvoir's ideas suggested that male-identified behavior and female-identified behavior (i.e., masculinity and femininity) were human artifacts, and this was great news for

people who wanted to do away with them. Nicholson explains that although the body's sex is taken to be fixed with this understanding (an idea that itself later came into question, as will be discussed in a later chapter) the physical body is not all there is to the story of what makes people who and what they are. De Beauvoir, and authors who followed, were able to show that there are interrelated but ultimately separate forces at work, and that one of them (i.e., gender) could be changed. The proliferation of writing that Friedman speaks of was generally optimistic and built upon de Beauvoir's suggestion that people, no matter their anatomy, had more control over their lives than they had previously thought. Moving from this idea some authors began to explore the topic of androgyny (a topic that will be discussed again in Chapter 6 of this dissertation). Of this exploration and the interest motivating it, Mary Anne Warren (1982) stated that

> [t]o many feminists androgyny has come to represent escape from the prison of gender – that is, from socially enforced preconceptions of ways in which women and men ought to differ in their psychology and behaviour. (170)

De Beauvoir's suggestion that people *could* change their sex-related behaviour seemed widely accepted, and so some moved on to question how *exactly* one ought to change that behaviour. Joyce Trebilcot (1982), for example, analyzed two forms of androgynism to determine which particular combination of masculinity and femininity would be most desirable for society: a form called "monoandrogyny" (which favours a single standard mix of masculinity and femininity to be adopted by all) or a form called "polyandrogyny" (which allows for whatever mix of masculinity and femininity individuals chose for themselves). Trebilcot concluded that the latter type, polyandrogyny, was the most desirable option of the two, partially because it allows for greater freedom of choice for individuals (168).

The basic beliefs of the earlier conceptualization of the concepts SEX and GENDER, which I have outlined in this section, can be summarized as follows:

> *Earlier Conceptualization*
>
> The concept SEX includes information about a person's anatomy (which is either male or female, and unchanging), while the concept GENDER includes information about one's social identity (as a woman or a man) and behaviour (which is masculine or feminine, and is flexible).

2.2.2 Later conceptualization: gender facilitates knowledge of sex

Although the distinction between SEX and GENDER was accepted (and perhaps even celebrated) some questioned the way that the division had been conceptualized. Marilyn Frye (1983b) for example, argued against particular versions of the earlier conceptualization that took gender to be not much more than "layers of cultural gloss over a biological substratum" (35). Instead, Frye argued that the connections between sex and gender, between bodies and society, should be understood differently. She wrote,

> Socialization molds our bodies; enculturation forms our skeletons, our musculature, our central nervous systems. By the time we are gendered adults, masculinity and femininity *are* "biological." They are structural and material features of how our bodies are. (37, emphasis in original)

Alison Jaggar (1983) argued along the same line in her work *Feminist Politics and Human Nature*. She wrote:

> Feminists have recognized for a long time that many of the psychological differences between the sexes are socially produced, but few have realized that this is also true of many biological sex differences. Biological sex differences

> are in part socially produced both on the level of the individual and the level of the species. (109)

As examples of biological change brought about by social influence, Jaggar discusses such things as the way the clothing an individual wears can shape the body over time, and the way that a species' anatomy can change over time because of social developments in its evolutionary history (109-110).

The later conceptualization that I will focus on builds upon insights such as Frye's and Jaggar's that biological sex or the body can change, and that gender or society can actively influence *how* the body is changed. According to the particular version of the later conceptualization that I will be describing here, gender is a creative force and the human conceptualization of SEX (among other things) is one of its products.

One of the most well-known proponents of what I call *the later conceptualization of SEX and GENDER* is Judith Butler. In her work *Gender Trouble* ([1990] 2006) Butler states,

> [i]f the immutable character of sex is contested, perhaps this construct called "sex" is as culturally constructed as gender; indeed, perhaps it was always already gender, with the consequence that the distinction between sex and gender turns out to be no distinction at all. (9 - 10)

The order Butler suggests here reverses the ontological arrangement proposed by the earlier conceptualization. Those who understand SEX and GENDER from the earlier conceptualization understand the former to be ontologically primary; without biological sex, there never would have been or could have been gender. Butler is suggesting that the reverse of this is actually the case. She explains:

> Gender ought not to be conceived merely as the cultural inscription of meaning on a pregiven sex (a juridical conception); gender must also designate the very apparatus

> of production whereby the sexes themselves are also established. As a result, gender is not to culture as sex is to nature; gender is also the discursive/cultural means by which "sexed nature" or "a natural sex" is produced and established as "prediscursive," prior to culture, a politically neutral surface *on which* culture acts. (10)

The concept GENDER, in Butler's view, involves something much more potent than it does in the earlier conceptualization. For Butler, GENDER involves a sort of cognitive framework that actively *facilitates* and *mediates* a person's experience and understanding of biological sex.

Another example of the later view is expressed by Thomas Laqueur in his work *Making Sex* (1990). In this work Laqueur criticizes the idea that biological sex can be known in the absence of gender, and speaks of the latter as a creative, human force. "Sex" he says, "…is situational; it is explicable only within the context of battles over gender and power" (11). Laqueur's comments suggest that he would think that the attempt to speak about sex in the absence of gender (which is, of course, what this dissertation aims to do) is naïve. Of such an endeavour, Laqueur says,

> [s]ex, like being human, is contextual. Attempts to isolate it from its discursive, socially determined milieu are as doomed to failure as the *philosophe's* search for a truly wild child or the anthropologist's efforts to filter out the cultural so as to leave a residue of essential humanity. And I would go further and add that the private, enclosed, stable body that seems to lie at the basis of modern notions of sexual difference is also the product of particular, historical, cultural moments. It too, like opposite sexes, comes in and out of focus. (16)

Later in this chapter I will present an argument to address this sort of concern about the legitimacy of the reconceptualization I present in this dissertation. For now, however, it is most important to highlight that authors like Laqueur

and Butler actually have very little to say about biological sex except to point out that sex itself (i.e., sex without gender, or sex in the absence of gender) *cannot be known*. Butler explains, saying "[t]he juridical structures of language and politics constitute the contemporary field of power; hence, there is no position outside the field, but only a critical genealogy of its own legitimating practices" (7).

In conclusion, the basic beliefs of the later conceptualization of the concepts SEX and GENDER can be summarized as follows:

> *Later Conceptualization*
>
> The concept GENDER involves a culturally creative force that facilitates any conceptualization of SEX.

2.2.3 The folk conceptualization: gender, also known as sex

Chapter Three of this dissertation will give a detailed description of the folk understanding of biological sex. In this section I will only briefly describe the folk understanding's interpretation of the relationship between SEX and GENDER. This description can be brief because the relationship is uncomplicated: what *gender* refers to, from the folk perspective, *is* sex.

Christine Overall (2003) points out that "the unspecified use of the term 'gender' has come to replace the use of the term 'sex' in ordinary social discourse" (8). What she means is that almost every time people use the word *gender* what they mean is *sex*; the word *gender* refers to the person's physical body and whether or not it is 'male' or 'female' (categories that are also understood through the folk perspective). Overall provides examples of this use, including questionnaires, forms, political speeches, and non-academic publications, all of which use the word *gender* but most probably mean physical, biological sex (8 - 9). Other examples such as the ones Overall

provides can be easily found. A *New York Times* article, for example, refers to a parent as thinking that the recently introduced drug Gardasil was "a gender-specific vaccine for a gender-specific disease" (Hoffman 2008). An article from the Canadian Broadcasting Corporation refers to a test that purports to predict "the gender of a fetus six weeks into pregnancy" (CBC News 2007). This article concludes by saying that a member of the British Medical Association "recommends waiting for an ultrasound or until the baby is born to discover the gender" (CBC News 2007). How does Overall know that the authors of such things most likely mean biological sex and not something else when they use the word *gender*? It seems that she knows this simply because this interpretation makes the most sense (8 - 9). Like the examples that Overall includes in her article, these statements about the gender of babies and fetuses, and illnesses that can be "gender-specific" make sense only if the word *gender* is taken to refer to biological sex: which is exactly the way that the folk understanding conceptualizes the two.

In conclusion, the basic belief of the folk conceptualization of the relationship between the concepts SEX and GENDER can be summarized as follows:

> *Folk Conceptualization:*
>
> The concepts SEX and GENDER both involve the reproductive type of a person's body.

2.3 Comments about the audience

Since the relationship between SEX and GENDER can be interpreted in these three different ways (and maybe in more still), my statement that my argument is about SEX but not GENDER will mean different things to different people.

Someone who approaches these topics from the earlier perspective would likely accept the distinction I make, and think it completely possible that the multidimensional model might have something important to say about sex, but nothing to add to the topic of gender. Someone who espouses the later conceptualization, on the other hand, would most likely deny that I could speak about sex in the absence of gender. In fact, from the perspective of the later conceptualization, my reconceptualization of sex would likely seem to be further proof of the constructive force that its proponents believe gender to be. My proposing a reconceptualization would be taken to be evidence of gender at work. Lastly, someone who understands sex and gender from the perspective of the folk conceptualization would also reject my distinction between the two, but for a different reason. With the folk conceptualization, sex *is* gender (and gender is sex), so my claim that I will be speaking about one but not the other makes about as much sense as to say that I am reconceptualizing bachelors, but have nothing to say about unmarried men.

I can anticipate how proponents of the later conceptualization and of the folk conceptualization would respond to my statement that my reconceptualization is about sex but not gender. Anyone who espouses either of these views would say: No, it is not possible to speak about one and not the other. To them, I would reply: Yes, it is, and the next section will explain how.

2.4 Two features of concepts

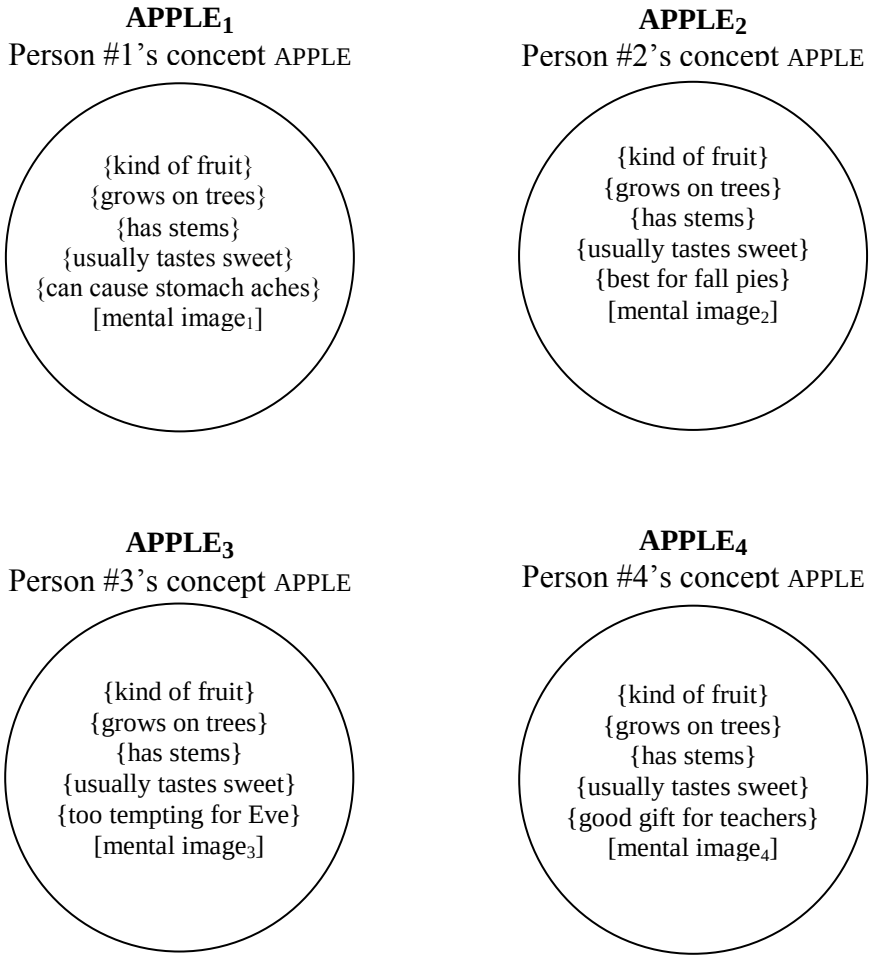
As mentioned in Chapter 1, Murphy (2002) explains that a concept of *x* is that group of information that comes to a person's mind when that person thinks about *x* or encounters a particular *x* (1). My concept APPLE, for example, is the

particular collection of information that I have in mind when I think about apples. It includes such elements as {kind of fruit}, {has stems}, {contains seeds}, {grows on trees}, {usually tastes sweet} and a vague image of an apple. These informational elements, in combination, are my concept APPLE.

When two or more people are engaged in a conversation, the informational elements of whatever concepts are relevant to the discussion can be divided into types: what can be called *shared* and *private informational elements*. If a particular informational element is common to two or more interlocutors' concepts of *x*, then it is a shared element; if the informational element is not shared with anyone else participating in the conversation then it is a private informational element. How a particular informational element will be classified will always depend upon certain features of the conversational context in which the concept is being called to mind: specifically, the informational elements of the interlocutors' concepts.

Consider a group of four people who are discussing apples. If we assume that these four people have all had experience with apples, then each person's concept is likely to include the five informational elements of my concept APPLE (described above), as these elements stem from typical experiences with apples (as opposed to specialist knowledge of apples, or unique experiences, as will be discussed). In this conversation, these five informational elements are shared conceptual elements. If we also assume that each of these four people has had their own non-typical experiences with apples then there is likely to be private informational elements as well. Perhaps one person, like Snow White, became violently ill after taking a bite from an apple. This individual's concept APPLE would contain the informational element {can cause stomach aches}, or something similar. Assuming that only this individual has had this experience, then in this conversational context {can cause stomach aches} is a private informational element. One can imagine

other personal histories that could cause the other three members of the conversation to each have private elements in their concept APPLE, such as {good gift for teachers}, or {too tempting for Eve}, or {best for Fall pies}. These four different conceptualizations are represented in the figure below (Fig. 2-1).

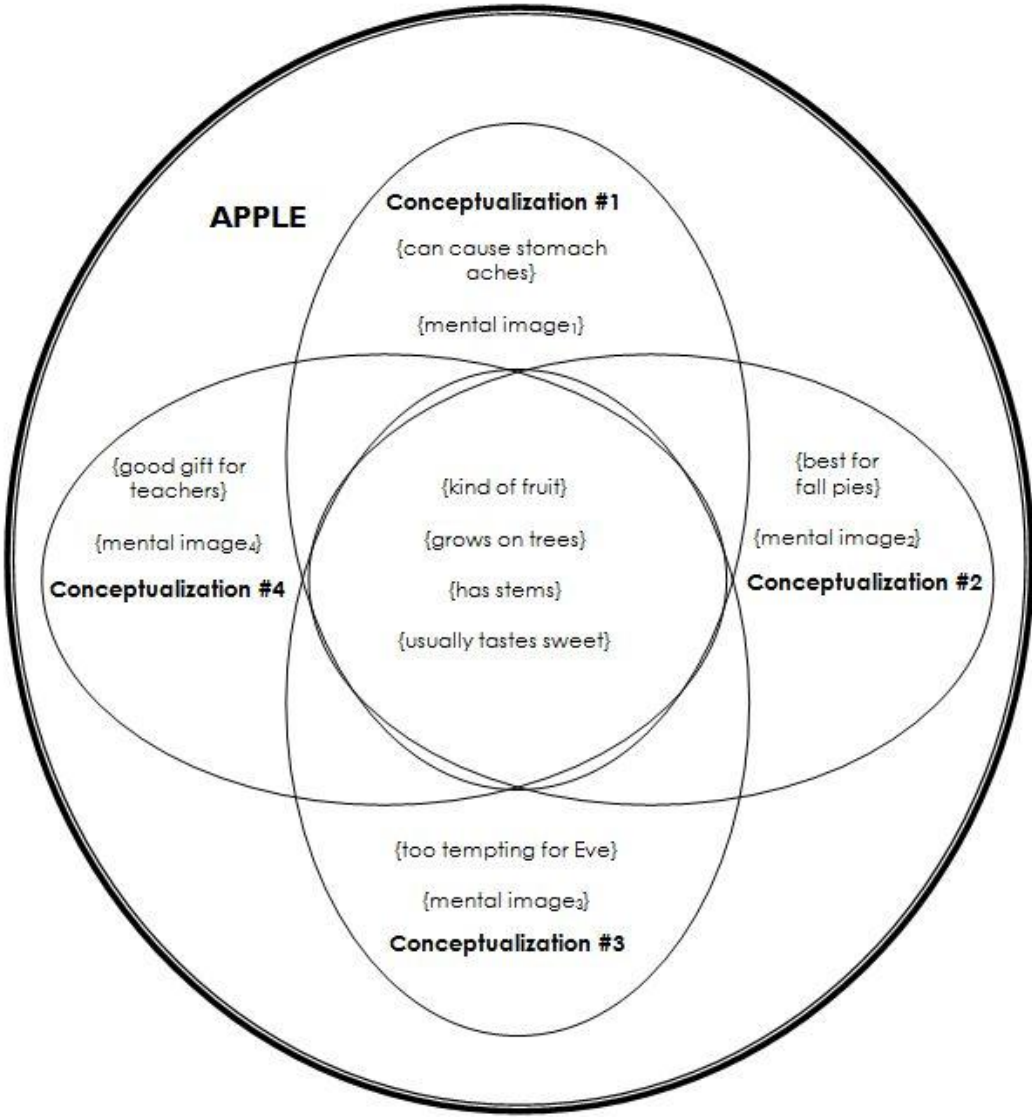


2-1 Four conceptualizations of APPLE

Separate representations of four conceptualizations of APPLE indicating the informational elements each includes.

What would happen if these four individuals became engaged in a conversation about apples? The success of their communication would depend upon the number of informational elements that are shared between these four conceptualizations (see Figure 2-2, below). For two or more people to communicate about apples, then between the different conceptualizations there must be at least one shared informational element. Without at least one shared informational element common to both people's concept of whatever is being discussed the conversation will quickly fizzle and both will walk away shaking their heads, wondering what happened. Without some shared informational elements it will never be clear if two or more people are communicating about the same thing.

Additionally, the more shared elements there are between these two people's conceptualizations of APPLE, the easier communication about apples will be between them. The fact that each person's conceptualization also involves private informational elements may or may not ever affect the conversation, as the conversation might not ever require that these elements be brought up. Any concept that becomes relevant to a conversation between two or more people will have either private or shared elements, or both. This dissertation engages the concepts BIOLOGICAL SEX, MALE, and FEMALE, and must recognize that the way these are conceptualized will not be the same for all. Not being the same *for* all, however, does not mean they are not the same *at* all. In the remainder of this chapter I will show that even if there is disagreement about the relationship between sex and gender (as there obviously is, given the three perspectives described above), there is still enough common ground between the different conceptualizations of sex to facilitate discussion.



2-2 Four conceptualizations of APPLE and the resulting shared features

This image represents the four concepts represented in figure 2-1, but now engaged together. This engagement sorts out the shared informational elements from the private. Shared informational elements for this hypothetical conversation are included in the shared space located in the middle of the picture. Private elements are those which are not included in the overlapping space.

2.5 Is my concept to your concept as apples are to oranges?

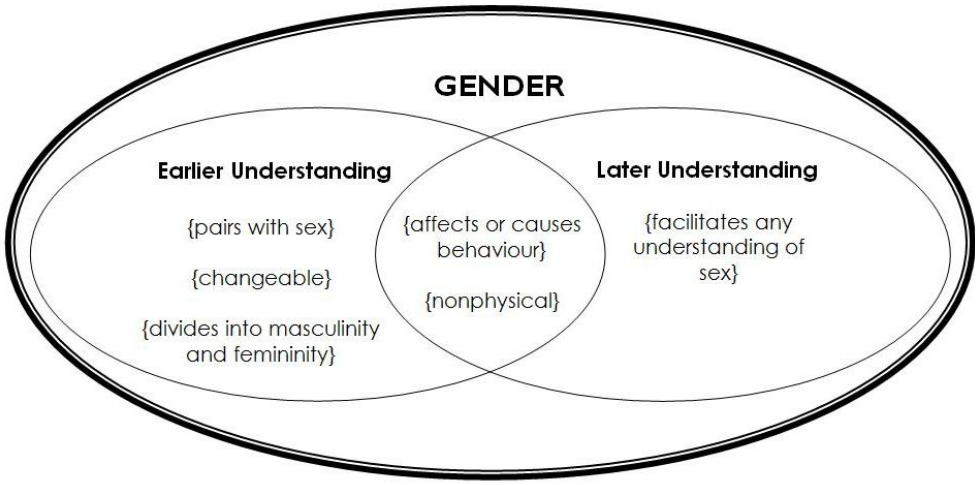
If three people, each holding one of three conceptualizations of SEX and GENDER in mind, were to have a conversation about gender, what would be the shared informational elements of this exchange? With respect to GENDER, I think the answer would be that there are no informational elements that would be shared across all three perspectives. The first step in seeing why this is so is to identify the conceptual elements each would likely associate with the concept GENDER.

Recalling Nicholson's (1998) and Friedman's (1996) descriptions of the earlier conceptualization, one can assume that this understanding would associate informational elements such as {pairs with sex}, {nonphysical}, {changeable}, {affects or causes behavior}, and {divides into masculinity and femininity}.

The later conceptualization would also likely lead to association of the informational elements {nonphysical} and {affects or causes behavior}. It would not, however, lead to the association of {pairs with sex}. The later understanding holds that gender creates or facilitates sex, meaning that it is through a gendered perception that people understand sex at all. This particular idea would introduce an element something like {facilitates any understanding of sex} that the earlier perspective certainly would not. Therefore, it seems that between the earlier and the later conceptualizations only {nonphysical} and {affects or causes behavior} would be shared elements. These two elements constitute the common ground between these two conceptualizations of GENDER (see Figure 2-3, below).

The folk understanding's concept GENDER, it seems to me, would not associate either of these elements. This perspective could not make sense of a conceptualization of GENDER that did not refer to SEX, as the former is

understood to be nothing more than the latter. Upon analysis, it turns out that the folk understanding might actually take gender to be nothing more than an informational element of the concept SEX (see Figure 2-4). As such, it would be incoherent if {nonphysical} were included, and {affects or causes behavior} would be associated only with the understanding that gender *as sex* affects behavior; this understanding is of course at odds with both the earlier and the later conceptualizations of GENDER.

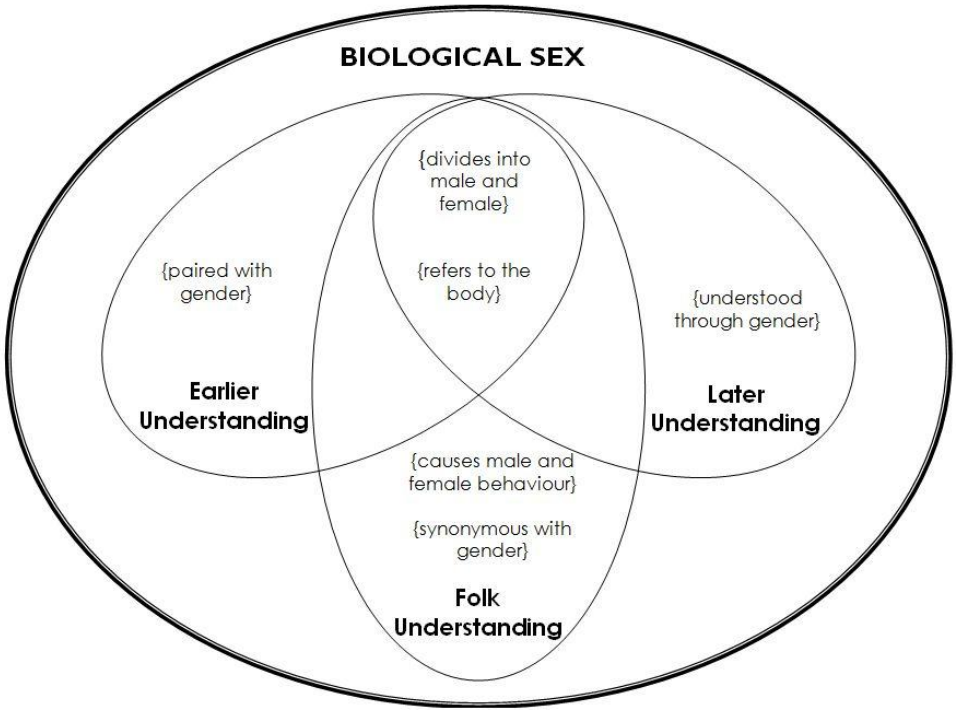


2-3 Conceptualizations of GENDER

Representation of the shared and private informational elements of GENDER as it is understood by the earlier and later conceptualizations. The folk conceptualization is not included here because it would not associate any of these informational elements with GENDER.

One could argue that the different conceptualizations of gender held by the three perspectives share an informational element something like {bears some relationship to sex}. This element, however, does not say much as there is no agreement about what form that relationship actually takes. Without agreement regarding the type of relationship, this particular informational element is not sufficiently unambiguous to pick out gender from all those

things that bear some relationship (any relationship) to sex. This single element, therefore, is not enough to establish that the earlier, the later, and the folk understanding's concept of gender all refer to the same thing.



2-4 Conceptualizations of BIOLOGICAL SEX

Representation of the shared and private informational elements of SEX, as it is conceptualized by the earlier, later, and folk conceptualizations.

This analysis, I believe, suggests that there is no cross-perspective agreement about what gender is. Because of there is no shared understanding, I think it must be concluded that there is no generic conceptualization of GENDER at all.

What I hope this discussion shows is that there *is* a foundation for cross-perspective communication about SEX, and thus, that it is possible for proponents of all of these conceptualizations to communicate about SEX in the absence of GENDER. The existence of just two shared features certainly does not guarantee that communication will be easy or without disagreement, but it does suggest that it is possible for the three perspectives to agree, in general, that they are speaking about the same thing.

2.6 Conclusion

This chapter has presented three conceptualizations of the relationship between the concepts SEX and GENDER in order to clarify the focus of the multidimensional model of SEX. This model does not consider such things as sexual orientation (such as homosexuality or heterosexuality), gender identity (such as man or woman), or any other psychological or social category related to sex. The model focuses on biological sex itself – a focus that means different things to different people.

As this chapter has shown, there are three general conceptualizations of the relationship between SEX and GENDER: (1) the earlier conceptualization, (2) the later conceptualization, and (3) the folk conceptualization. The earlier and the folk conceptualizations could each make sense of a model that focuses exclusively on biological sex, although they would have slightly different interpretations of what this means. For someone who conceptualizes SEX and GENDER in the way that the later conceptualization does, on the other hand, my statement that the multidimensional model is about SEX, but not GENDER, demonstrates my misunderstanding of the relationship between these concepts.

But even if the later conceptualization has it right, and sex cannot be understood in the absence of gender, I think that people can seek to make a

conceptualization more accurate while simultaneously doing their best to manage the influence and distortion of social and cultural forces. And if one believes that this type of management is impossible, or that no concept can ever be more accurate than another, there is still another reason to engage in reconceptualization: instead of conceptual *accuracy*, the process of reconceptualization could be justified on the basis of conceptual *efficacy*. Even if we can never know the relative accuracy of different conceptualizations, we *can* know which particular conceptualizations make our lives better. A person can believe that the comparative accuracy of different conceptualizations is unknowable, while at the same time believing that reconceptualization is important because it can improve human life and increase happiness. This argument will be unpopular with those who think that the accuracy of different conceptualizations *can* be known and judged, but it is not intended for them. My intention with this argument is only to point out that even if people believe that a concept's accuracy cannot be known, they can still think that reconceptualization can be an important endeavour to undertake.

I will have very little else to say about the concept GENDER in the remainder of this dissertation. Although the multidimensional model of sex might have interesting and important implications for GENDER (the number of which will likely depend upon which of the three conceptualizations one espouses) I will not spend any time discussing them. I will be talking about the physical body and its sexual types. I think that the material discussed in this chapter gives good reason to think that it *is* possible to meaningfully discuss biological sex without also discussing gender, no matter what position one holds on the latter. And, in any case, there is reason to think it might be best to avoid discussions of gender altogether. As the previous section demonstrated, there is virtually no assurance that everyone who is speaking about gender is

actually speaking about the same thing. The lack of shared elements between the three major positions shows that there is likely *no* shared meaning between them, and that the meanings themselves might be incompatible. Returning to the concept SEX might actually be the best direction to take.

Chapter 3

The Folk Understanding of Sex

3.1 Introduction

This chapter focuses on what will be called *the folk understanding of biological sex,* which is the understanding of sex that is most at odds with the multidimensional conceptualization I am putting forward. The folk understanding is, simply put, the understanding that most people have of biological sex. In Chapter 1 I very briefly identified and outlined what I see as the three basic beliefs of this understanding, which are again: (1) group member homogeneity, (2) atomism, and (3) logical opposition. These basic beliefs are at the heart of most people's understanding of sex, and this chapter will serve to describe them in detail.

Before beginning this description I want to briefly emphasize that I do not claim to know *exactly* how any one person thinks about biological sex, nor do I claim to know how *everyone* thinks about it. I acknowledge that there may be people who think about biological sex without holding one, two, or any of

the exact beliefs I will describe in this chapter. Because of this possibility, it needs to be emphasized that the beliefs I am about to discuss should be treated as *common themes* within the folk understanding: ways of thought that are held by many, and evidence for which can be found frequently in day-to-day activities.

3.2 Evidence of the folk understanding

One way to gain understanding of the most fundamental beliefs that a group of people have about a particular thing is to study how that group interacts with that particular thing: how they speak about it, what they say about it, and what sort of role it plays in their day to day lives. This is, roughly speaking, how one creates an ethnography of a culture: by immersing oneself within the group and observing and documenting in order to gain an overall understanding of how that particular group of people function, what they value, and why they value it. If a group of ethnographers were to become immersed in Western culture, what evidence would they encounter about how people think about sex? What sort of conclusions could they suggest about general patterns and themes in these peoples' thoughts, and the logic suggested by them? These are the two questions that this section and the next will attempt to answer.

An ethnographer interested in learning about Western society's beliefs about sex would be inundated with information, since our thoughts about the concepts SEX, MALE, and FEMALE are on display throughout society. Frye commented that there is "a great pressure on each of us to *inform* everybody all the time of our sex" (1983b, 23, emphasis in original). She explains,

> Sex-identification intrudes into every moment of our lives and discourse, no matter what the supposedly primary focus or topic of the moment is. Elaborate, systematic, ubiquitous

> and redundant marking of a distinction between two sexes of humans and most animals is customary and obligatory. One *never* can ignore it. (19, emphasis in original.)

Frye discusses various examples of some of the "thousand ways" people in Western culture "mark" their sex including social behaviours, etiquette, and language use, as well as wearing sex-related "gear and accessories" and "badges and buttons" (19 – 29). One need only wander through a shopping mall to see examples of what Frye is speaking about; in our culture we can buy a seemingly infinite number of things to be worn, eaten, placed on the body, used on the body, or given to others all of which send (or are at least *intended* to send) the message "I am female" or "I am male" to others. (In some cases these purchased things might be used to reinforce this message to oneself as well.)

It is important to emphasize, as Frye does in the passage above, that this process of continuous but indirect display of one's sex is closely tied to the assumption that one can display a sex that is *either* male *or* female. This culture does not react well to ambiguity. An article that appeared in *The Toronto Star* told the story about a baby, Storm, whose sex had not been publicized to the general public (Poisson 2011). The author of the article wrote "[w]hile there is nothing ambiguous about Storm's genitalia, they [Storm's parents] aren't telling anyone whether their third child is a boy or a girl" (Poisson 2011). People had strong reactions to this choice. CNN called the family for comment (Newton 2011). Commentators in Canada decided to weigh in (Kay 2011, Sommerville 2011); a newspaper asked a Canadian musician to weigh in (Jenkins 2011). Within a week of its first appearance, it was reported that there were approximately 35000 comments about the story posted across various sites on the internet (Wallace 2011); the story of Storm's

secret ranked 11th on an early list of the stories shared most often on Facebook in the year 2011 (Global News 2011).

In addition to clarity, there is also the expectation that whatever sex one publicizes is the sex of one's own body (again limited to being *either* male *or* female). To "inform" others that your sex is one *other than* what they perceive yours to be can be seen as tantamount to deception; because of this, attempts to change from one category to another are not well-tolerated in our culture at present. One interesting example of this sort of thinking about sex was exhibited in reaction to a case involving sexual categories and pregnancy. A few years ago *The Oprah Winfrey Show* aired an episode entitled "The World's First Pregnant Man." The show's promotion emphasized the case's apparently bizarre biology:

> It's the story that has the media buzzing and people talking. A happily married couple who lives in a normal neighborhood in America are expecting their first child. But, there's a big twist… the husband, Thomas, is the one pregnant. Thomas is here with his wife for their first television interview. How is this possible? Find out as the couple shares with Oprah the details of their pasts, their relationship and their incredible pregnancy. Also, watch as our cameras capture Thomas's ultrasound and take us inside their home to see the plans for the family's nursery (Oprah.com 2008).

One "detail of their past" emerged during the episode: Thomas was a female-to-male transsexual.

Many people reacted negatively to this information about Thomas's biology. One of Oprah's viewers, for example, said of Thomas "[s]he is a woman, and I don't seem to remember gaining a spot on Oprah or any other talk show when I was pregnant with my two sons" (Oprah.com 2008). Another viewer commented "I am not convinced this is the first time a woman has dressed like

a man while pregnant" (Oprah.com 2006). Another viewer facetiously asked "I'm pregnant so if I say I'm a cat does that mean that I'll get to be on Oprah?" (Oprah.com 2008). Speaking of Thomas' sex, Jeff Jacoby (2008) wrote in *The International Herald Tribune*

> [I]t takes more than a mastectomy and hormone treatments to overturn biology. Thomas may be a man in the eyes of the law, but she remains physically a woman, with a woman's reproductive system, a woman's genitals, and a woman's chromosomes.

A well-known Canadian academic often asked for comment on controversial matters, Margaret Somerville, was quoted as saying "It's a very touchy thing, this deconstruction of our biological reality. Where I would do a reversal on this is to say, 'You've artificially made yourself a man. You're not a man, you're a woman and you're having a baby and you're actually having your own baby" (Gardner 2008).

The belief in two mutually exclusive sexes is held so deeply in our culture that in addition to expecting people to publicize their sex, and to be honest about it (within the confines of the two options offered) we also routinely divide people according to their reproductive category. One such practice that has begun to draw attention is the mixing of the two recognized sexes in hospital rooms. People have had mixed reactions to some Ontario hospitals doing this (Hendry 2011), as have others when it has been tried elsewhere in Canada (Dobrovnik 2010). Hospitals in the United Kingdom have also been criticized for placing male individuals and female individuals in the same ward room together (Burnett 2011). The Executive Director of the Registered Nurses' Association of Ontario wrote a letter speaking out against the mixing of people with different anatomies in the same hospital room on the grounds that the practice can threaten "safety, privacy, and dignity" (Grinspun 2010). Beliefs about sex even influence the shape and structure of buildings under

construction. To be lawful and "up to code" builders must take into account the sexual category (again, assumed to be *either* male *or* female) of those who will be using the building (Building Code Act 1992. Ontario Regulation 350/06).

What might be the thinking underlying these interests, reactions, and requirements? What biological and/or social rules, exactly, are the rule-breakers perceived to be breaking? What conceptualizations of SEX, MALE, and FEMALE underlie these attitudes? What basic beliefs do these behaviours indicate? The following three sections will outline three beliefs which, I believe, form the basic assumptions behind the examples just provided.

3.3 Three basic beliefs of the folk understanding

3.3.1 *Belief #1: Group member homogeneity*

The "group members" that the belief in group member homogeneity refer to are those people who are placed in either the category 'male' or the category 'female' by all the sorts of divisions just spoken of. To say that these group members are assumed to be homogeneous means simply that it is believed that all females are the same in terms of their *being* female (i.e., their "femaleness"), and that all males are the same in terms of their *being* male (i.e., their "maleness"). This belief is likely behind the thinking of those who favour sex-separated hospital rooms; the assumption seems to be that any two females can share a room because their femaleness will be the same, and any two males can share a room because their maleness will be the same.

What does it mean to say that individual males are believed to be alike in terms of their "maleness," or that individual females are thought to be alike in

terms of their "femaleness"? By this I mean that any female is thought to be *as* female as any other female, and any male is thought to be *as* male as any other male. If this seems unclear, consider that I am using each of the words *female* and *male* in two different ways here: to refer to a type of individual on one hand, and a type of quality or characteristic on the other. To clarify the different uses, the word *femaleness* can be used to refer to the quality or characteristic of being female. Saying that members of the category 'female' are thought to be homogeneous means that any individual female is thought to have as much femaleness as any other female. (And, of course, the corresponding belief is that any individual male is thought to possess as much maleness as any other male.) According to the folk understanding, if two people are both female, then they are female to the same degree; if they are both male, then they are male to the same degree. Were it otherwise, insistence on same-sex hospital rooms or public washrooms would make little sense. (A likely objection to this characterization is anticipated and discussed in the next section.)

3.3.2 Belief #2: Atomistic structure

The belief in atomism is nothing more than the belief that maleness and femaleness cannot be gauged or measured; they are either completely present or completely absent. Each exists as a single, indivisible quality that a person either does or does not possess.

To better understand what I mean when I say that the folk understanding takes sex to be atomistic, one can try to imagine a quality called "male existence" and another called "female existence." Without knowing exactly what either of these things are, nor whether these qualities are physical, nonphysical, or a combination of the two, one can ask questions about the

possibility of their division. For example, one can ask, can a person have just part of "female existence"? One can also ask, is it possible for a person to have only half of the complete "male existence"? I think most people would say that the answer to both of these questions is no: the general feeling operating within the folk understanding is that any male is a male without qualification, and any female is a female without qualification. Maleness and femaleness, in the folk understanding, are always unmitigated.

The connection between the belief in atomistic structure and the belief in group member homogeneity is easy to see. Because maleness and femaleness are assumed to be simple qualities (i.e., qualities that are indivisible and composed of no parts), anyone who possesses one of them will be thought to possess it just as much as anyone else. All males will be equally male, and all females will be equally female; things cannot be otherwise if the qualities of maleness and femaleness are simple and indivisible.

Some might argue against my description of this particular belief. Someone might ask me: if people assume all females are the same with respect to their femaleness, and that femaleness itself is an all-or-nothing thing, why do *I* recognize some people as being more female than others? (The same question could be asked about males and maleness.) To this concern, I would say that the first important task is to identify and clarify those features that are being considered important when the sex of others is identified. Returning to the three conceptualizations from the previous chapter can help to do this.

Chapter Two outlined three different interpretations of the relationship between SEX and GENDER: the earlier, the later, and the folk conceptualizations. People who espouse the folk understanding of sex will most likely take the third of these perspectives, which does not recognize a distinction between sex and gender. If no distinction between sex and gender

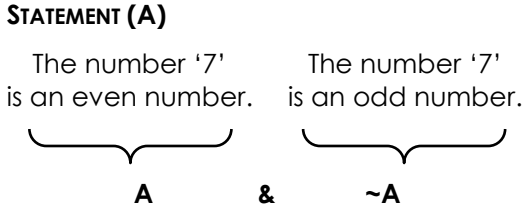
is being made, then any difference between members of the same folk-categories can be attributed to sex and sex alone. However, if one were to take a position more like the earlier conceptualization, a position which takes SEX and GENDER to be different, then one has more options. Once SEX and GENDER are distinguished, it could be seen that what one is observing is a difference in gender (i.e., how manly or womanly, masculine or feminine the person is), but not in sex (i.e., how male or female the person is). There is an important difference between the beliefs that there are more womanly women and more manly men, and the beliefs that there are more male males and more female females. To see this difference, one can consider how one could go about altering these things. To be more "womanly," for example, I could try to take up less physical space, speak with a higher pitch, paint my fingernails and wear pink; but what could I possibly do to become "more female"? It is even more difficult to imagine what I could do to make myself *less* female, or even *not* female. I think that someone who holds the folk conceptualization of the relationship between SEX and GENDER would likely say that there is nothing I can do to accomplish any of these things: I just *am* female, and it is out of my hands.

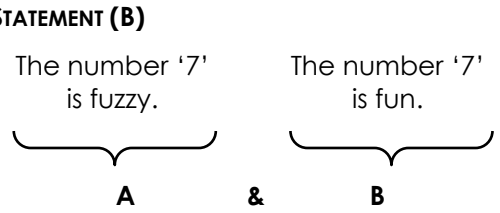
3.3.3 Belief #3: Logical opposition

This third belief of the folk understanding, which will be detailed in this section, is that the concepts MALE and FEMALE are logically opposed. Of the three basic beliefs being presented here, this is the one that is most likely to be explicitly stated by proponents of the folk understanding because it has to do with the relationship between the two sexual categories that the folk understanding recognizes.

According to what is called the *law of non-contradiction,* something cannot simultaneously both be the case and not be the case. For example, if I were to say "Today is my birthday and it is not my birthday" I would be breaking the law of non-contradiction. It is either my birthday, or it is not my birthday today; because of the meaning of the word *birthday*, today cannot be both. The law of non-contradiction expresses this idea more formally by saying that something cannot be both A and ~A at the same time.

Before discussing the law of non-contradiction in relation to sex, I will apply it to different concepts that have a similar relationship as MALE and FEMALE do to each other within the folk understanding: ODD NUMBER and EVEN NUMBER. Consider the statements (A) "The number '7' is an odd number and an even number" and (B) "The number '7' is fuzzy and fun." Statement (A) violates the law of non-contradiction. Although statement (B) is clearly false and might be pure nonsense, it does not violate the law of non-contradiction. To see why this is the case, one must consider the elements of each statement. Statement (A) can be decomposed into the components "The number '7' is an odd number" and "The number '7' is an even number." Statement (B) can be decomposed into the components "The number '7' is fuzzy" and "The number '7' is fun." Once the statements are decomposed in this way, their logical structure can be represented as follows:





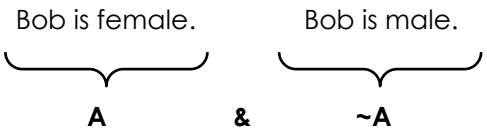
Statement (A) takes the form A & ~A because of the relationship between the meaning of the terms *even number* and *odd number*. Statement (B), on the other hand, ends up having the structure A & B because of the relationship (or lack thereof) between the meaning of the terms *fuzzy* and *fun*. The categories 'odd number' and 'even number' are logically opposed to one another; something that can be categorized as one cannot be categorized as the other as well. If one knows what an even number is and what an odd number is, then one also knows that a number that is even cannot also be odd, and a number that is odd cannot also be even. The categories 'fuzzy' and 'fun,' on the other hand, do not have this type of relationship. One's knowledge of a thing's being fun is unaffected by one's knowledge of a thing's fuzziness, and vice versa. So, if two terms are known to be logically opposed, then it is known that the presence of one signals the absence of the other.

When understood from the perspective of the folk understanding, the categories 'male' and 'female' bear the same sort of relationship to each other as the categories 'odd number' and 'even number' do to one another. The folk understanding takes the categories 'male' and 'female' to be logically opposed, which means that people who understand categories of sex in this way take {not female} to be an informational element of the concept MALE and {not male} to be an informational element of the concept FEMALE.

To illustrate this particular relationship, consider the statement (C) "Bob is female and male." If this statement were decomposed it would have the

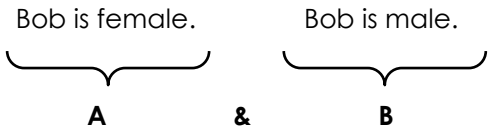
components “Bob is female” and “Bob is male.” Representation of this statement’s logical structure reveals that, in the view of the folk understanding, it is the same as the statement “The number ‘7’ is an odd number and an even number,” which is A & ~A:

STATEMENT (C)



Statement (C) has the same logical structure as statement (A) because they each include a pair of logically opposed categories. However, if the categories ‘male’ and ‘female’ were not taken to be logically opposed (as they are under the folk understanding) then statement (C) would be as acceptable as statement (B) which includes simple conjunction (as is in Statement (D), below).

STATEMENT (D)



This belief that the categories ‘male’ and ‘female’ are opposed has two important implications. First, a person’s sex will be thought to have epistemic import; with the folk understanding, knowing someone’s sex is knowing more than the simple fact that the person “is female” or “is male.” Because of the belief in logical opposition, knowing that a person is male or is female brings with it the knowledge that the person is either *not* female and *not* male, respectively. In the same way that knowing something is an odd number

brings with it the knowledge that it is *not* an even number, knowing a person's sex brings with it the knowledge that that person is *not* of the other sex.

The second important implication is that, according to the folk understanding, no person can be both male and female at the same time (and maybe not even at separate times). Because of the assumption of logical opposition (perhaps in combination with the belief in atomistic structure), the folk understanding of sex cannot make sense of simultaneous maleness and femaleness in the same person. A person being both male and female could only be understood as someone who is both male and not-male, female and not-female, at the same time; to understand a person's sex in this way, of course, is not to understand that person's sex at all (at least by the standards of the folk understanding).

The belief in logical opposition can perhaps explain some of the reactions to Thomas Beattie's situation, which was described above. Although Thomas interpreted himself as a man, others interpreted him as a woman (once they had been told about his history); since one cannot be both a woman and a man (i.e. both male and female) within the folk understanding, someone had to be mistaken. Kate Bornstein's (2003) explanation of transsexual experience in this culture supports this interpretation. Bornstein writes:

> through it's [*sic*] insistence and fierce maintenance of the man/woman dichotomy, the culture puts the prechange transsexual in the position of needing to say a permanent good-bye to one gender, and then and only then say hello to another. While that good-bye/hello is certainly an option, this culture is making it the *only* option. (43)

As will be argued later in Chapter 4, this sort of thinking also reflects essentialist assumptions about biological sex (i.e. the belief that there is a 'male' essence that must be exchanged for a 'female' essence.)

3.4 Conclusion

In this chapter I have provided a description of the most basic beliefs that can be associated with the folk understanding of biological sex. This chapter has aimed to be non-critical of the folk understanding, and whether or not these beliefs are accurate has yet to be answered. A lot depends upon this evaluation. If it turns out that the folk understanding is mistaken about these three beliefs, then there will be a reason to seek alternatives. Given the motivation people have to hold on to their understandings of sex and the risk that reconceptualization poses to personal identity, establishing the *need* to reconceptualise is of utmost importance. The discussion will turn, in the next chapter, to evaluating the accuracy of these beliefs.

Chapter 4

Challenges to the folk understanding

4.1 Introduction

Now that the three basic beliefs of the folk understanding have been described, the question of their accuracy can be addressed. To begin this discussion, I will describe how the folk understanding of biological sex provides a good example of what is called "psychological essentialism." I will then discuss the relationship between psychological and metaphysical essentialism in order to show that an argument against the latter is an argument against the former by virtue of the relationship that exists between them. I will then proceed to present three arguments that aim to show that essentialism about sex, and thereby the three beliefs of the folk understanding, are very likely to be mistaken.

4.2 The folk understanding and essentialism

Susan Gelman describes psychological essentialism generally as "a reasoning heuristic" (2009, 124), and more specifically as "any folk theory of concepts positing that members of a category have a property or attribute (*essence*) that determines their identity" (Gelman 2001). Gelman and Wellman (1991) also describe the essence in terms of its psychological function, saying it "is the unique, typically hidden property of an object that makes it what it is, without which it would have a different identity" (215). Elsewhere, Gelman (2009) describes it as "an immutable feature or substance… that causes category members to be what they are and have the properties that they do" (124).

The thoughts and associated logic I have described in the previous chapter suggest that the folk understanding of sex is a form of psychological essentialism. The three commitments of the folk understanding (group member homogeneity, atomism, and logical opposition) presuppose the existence of *something* that has an atomistic structure, and the possession of which can create a meaningful group of people that is logically opposed to some other meaningful group of people. Within the folk understanding this *thing* that is presupposed by the three commitments is the essence (either of maleness or femaleness).

Many authors note that psychological essentialism is an observation about what people *believe* exists, not an observation or claim about what things do exist (Gelman 2001; Medin 1989, 1477; Gelman and Wellman 1991, 229; Gelman 2009, 124). Belief in something, most people well know, does not establish its existence, no matter the intensity of one's belief in that thing. So, even though the folk understanding's commitment to two distinct sexual essences is strong, the strength of this belief offers no evidence for the existence of such essences. To point out that the folk understanding is an

example of psychological essentialism is only to point out something about how a group (in this case, "the folk") thinks about a certain thing (in this case, biological sex).

While claims about the role that beliefs about essences play in people's understanding of the world are taken up by psychologists, claims about whether or not essences actually do exist are taken up by philosophers. But this is not to say that they agree about this matter. Plato, for one, thought that essences existed. In the dialogue *Parmenides*, for example, Plato (1997) suggests that things "come to be like by getting a share of likeness, large by getting a share of largeness, and just and beautiful by getting a share of justice and beauty" (131a, 364).[2] For Plato, people recognize individual things as being of a certain type of thing because they exhibit essences of those types; for Plato, it is the essence that we recognize. If Platonists were to consider biological sex, they would say that some people are male because they (to use Plato's language) "get a share" of the essence of being male (i.e., maleness), and other people are female because they "get a share" of the essence of being female (i.e., femaleness). Other philosophers would deny the existence of male and female (and any other) essences. Richard Rorty ([1994] 1999) for example suggests what he calls "panrelationalism" in place of essentialism (52). To explain his position, he says, "ask what the essence of the number 17 is – what it is in itself, apart from its relationships to other numbers" (52). Rorty's point is that one cannot attempt to identify the essential feature(s) of number 17 (or of any other number for that matter) without also discussing *other* numbers (53). Rorty, therefore, would deny Plato's suggestion that the number 17 is recognized as such because it "gets a share" of the essence of 17. In a description of his own antiessentialist position and those who share it, he

[2] In his introduction to this dialogue, Cooper (1997) states that "if Plato has a 'spokesman' here, it is Parmenides" (359). This excerpt from the dialogue is spoken by Parmenides.

states: "We suggest that you think of all such objects as resembling numbers in the following respect: there is nothing to be known about them except an initially large, and forever expandable, web of relations to other objects" (53). A similar argument could easily be made with regards to biological sex. It is possible to ask what maleness is "in itself," but is it possible to give an (accurate) answer that does not refer somehow to femaleness, and vice versa? If it is not, then perhaps maleness and femaleness are relationally defined, rather than essentially.

In the sections that follow in this chapter I will present and discuss three reasons to think that male and female essences do not exist. These reasons will also serve to weaken the folk understanding because of the relationship that exists between the type of essentialism Plato and Rorty comment on, and the type of essentialism authors like Gelman are interested in. Beliefs about *x* presume the existence of *x*; but if there is good reason to think that *x* does not in fact exist, then there is also good reason to think that beliefs about *x* are flawed at this most basic level (i.e., at the level of existence). Because this relationship exists between the two types of essentialism, the three reasons I am about to present work against both forms.

4.2.1 First challenge: species, sex, and their evolutionary histories

The most compelling reason to think that essentialist thinking about sex is wrong becomes apparent when one considers the dominant theoretical position in current biological thought. Charles Darwin's theory of evolution and thoughts that have followed from it deny the belief that there are essences that qualitatively delineate living things. In rejecting essentialist thought, Darwin's theory relocated human beings from their elevation *above* all other living things, to a position that placed them *among* all other living things. In

the first chapter of Darwin's ([1879] 2004) *The Descent of Man* he provides an examination of physical similarities between human beings and other living creatures. The goal of that chapter, in Darwin's words, is to show "how far the bodily structure of man shows traces more or less plain, of his descent from some lower form" (22). Darwin provides numerous examples in support of this claim, ranging from a description of baboons sick from drinking too much alcohol the previous night (24), to curious human features such as wisdom teeth (37) and relatively sparse body hair in comparison with other mammals (36). He concludes the chapter by saying:

> Thus we can understand how it has come to pass that man and all other vertebrate animals have been constructed on the same general model, why they pass through the same early stages of development and why they retain certain rudiments in common. Consequently, we ought frankly to admit their community of descent. (43)

Admitting this, Darwin explains, also means accepting that human beings are not descended from "demi-gods" as others before him had thought (43). Consider this statement of Darwin's ((1859) 2006) that he includes toward the end of his *Origin of Species:*

> Hereafter we shall be compelled to acknowledge that the only distinction between species and well-marked varieties is, that the latter are known, or believed, to be connected at the present day by intermediate gradations, whereas species were formerly thus connected. (304)

Darwin is here stating that people's judgment that two presently existing creatures are (and always have been) essentially different species arises from their overlooking the whole history of that species. Put plainly, having one's understanding arrested at the present affects judgments and perceptions about the degrees of difference (and with it, judgments about the likelihood that essences exist).

Although it tends to be overlooked, Darwin had similar things to say about the continuity between maleness and femaleness. In fact sex and sexual activity were two features that Darwin used to draw connections between human beings and other living creatures. Of sex as an activity, for example, Darwin ([1879] 2004) notes that "[t]he whole process... is strikingly the same in all mammals" (24). Of the individual sexes, Darwin writes, "[m]an differs from woman in size, bodily strength, hairiness, &c., as well as in mind, in the same manner as do the two sexes of many mammals" (25). Other passages from Darwin's ([1879] 2004) *Descent of Man and Selection in Relation to Sex* suggest that he rejects essentialism about sex just as he rejects essentialism about species. For example, Darwin states that "some remote progenitor of the whole vertebrate kingdom appears to have been hermaphrodite or androgynous" ([1879] 2004, 189). (In a footnote to the preceding statement, Darwin attributes this idea to Gegenbaur, 1870, s. 876.) Darwin's comments on rudiments related to sex also emphasize continuity between the sexes. He says, "Here we are not concerned with the vestige of a part which does not belong to the species, in an efficient state, but with a part efficient in the one sex, and represented in the other by a mere rudiment" (41). Darwin highlights that the modern human male body contains some rudimentary versions of elements of the female reproductive system, as well as rudimentary mammary glands (41-42, 188-189). In relation to the latter, Darwin suggests that "long after the progenitors of the whole mammalian class had ceased to be androgynous both sexes yielded milk, and thus nourished their young" (190).

Someone immersed in the folk understanding might object that Darwin was speaking, in these passages, about such an enormous amount of time that his comments do not bear on his thinking about the *modern* human sexes and whether or not they are essentially different (and therefore, that these passages ought to have no bearing on *our* thinking about the same). Someone might

argue that whether or not human beings had a hermaphroditic ancestor (Darwin uses the word "androgynous" in the quotation selected here) *millions of years ago* is irrelevant to whether or not males and females are essentially different today.

To address this criticism it is important to note that Darwin viewed the evolution of species as beginning with a common ancestor that branched into different forms, each form developed further and then branched into other forms again, and each of those forms developed further, etc. This branching and developing has been going on for such a long period of time that we, as human beings, have a difficult time appreciating this. If we focus on what is in front of us now, it seems as if there really are essentially different, totally disconnected species. It is, for example, difficult to believe that at some point in the past there existed some living thing that, following one evolutionary path, evolved into a tiger, and following another evolutionary path, evolved into us. What could this common ancestor have been?

It is important to note, however, that what *is* the case is not determined by what can be *understood* to be the case: human history is not determined by the capability of human imagination, nor by what any particular group can appreciate at a particular time. If our mental capabilities were such that we could imagine the larger picture which includes a history that extends further back than the history of our own species, we would see that there are common threads all leading back in time to a shared beginning, and that our impression that species are distinct, is false. Understanding these basic notions of evolution is an imaginative exercise, because we, as human beings, cannot experience all of evolutionary history directly. If the imagination is not used, and immediate experience is all that is given consideration, then one might be misled to think that present-day species are all essentially different.

To better understand the effect that perception can have on the impression of continuity (or discontinuity) between species, one can consider a suggestion made by David Hull (1965a, 1965b, 2001). In his two-part 1965 paper "The Effect of Essentialism on Taxonomy – Two Thousand Years of Stasis," Hull argued that the concept SPECIES cannot be properly defined by an appeal to a single essential property. Hull's (1965b) conclusion in this paper is that SPECIES can be given no better than a disjunctive definition such as the following:

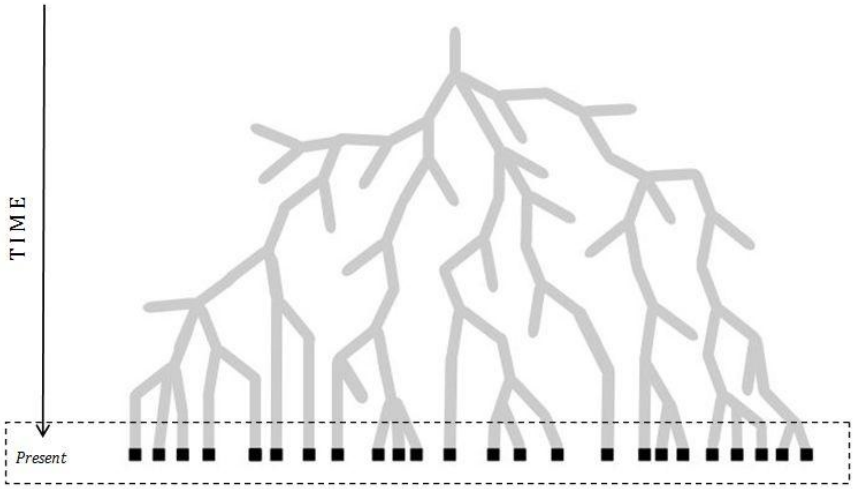
> 1. consistently interbreed producing a reasonably large proportion of reasonably fertile offspring, or
>
> 2. consistently serially interbreed with synchronic populations producing a reasonably large proportion of reasonably fertile offspring, or
>
> 3. do not fulfil either of the first two conditions but have not diverged appreciably from a common ancestry which did fulfil one of them, or
>
> 4. do not fulfil any of the first three conditions because they do not apply but are analogous to populations which do fulfil at least one of the first three conditions. (13)

For this definition, because it is disjunctive, Hull says, "the fulfilling of *any one* of the conditions is sufficient and the fulfilling of *at least one* is necessary" (13, Hull's emphasis). In a later work, Hull (2001) states that this sort of definition is actually not very helpful, as

> [o]nce the amount of labour necessary to use cluster analysis is expended, it works only for *contemporaneous time-slices of those species that exhibit a unimodal distribution* – a single bell curve around a single mean. But many species exhibit multimodal distributions. Which characteristics are 'typical' varies from geographic location to geographic location. Averaging this variation to form a

> single cluster obliterates an important feature of biological species. (206, Hull's emphasis)

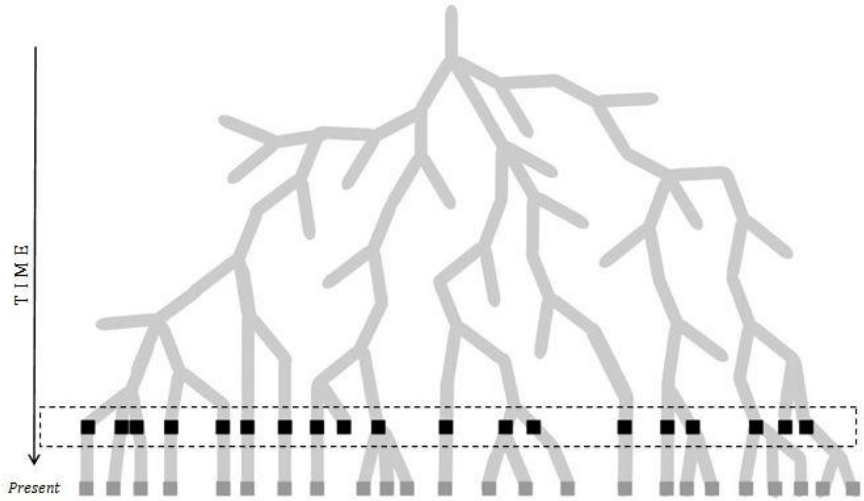
Hull's explanation here focuses on other matters, but his statement about "contemporaneous time-slices" is most important for the current discussion. Figure 4-1 (below) illustrates the importance that looking at a "time-slice" can have on one's understanding of things and the differences between them. Each black square in Figure 4-1 represents a modern species. Because only the present variation of these species is the focus, it appears that these species are distinct from one another. However, if a different "time-slice" were chosen then a different set of species would become the focus, and they would appear to be distinctly different as well (see Figure 4-2, below).



4-1 Present species "time slice"

Representation of a "time-slice" as mentioned by Hull (2001, 206). In this image different species are represented by black squares, and their evolutionary history is represented by grey branches leading back in time. Part of Hull's point seems to be that to recognize a group *as a* species (even disjunctively defined), one must focus on a single point of time (such as the present, as this image does), and disregard the history of those groups. Compare figure 4-2.

A similar case can be made in relation to sex. It is known individual species can evolve both *from* a hermaphroditic state and *to* a hermaphroditic state (Ghiselin 1969, 189; 2006, 368). Along each branch of this evolutionary tree, then, one could find a species that, at some point, was otherwise (sexually speaking). For any species then, the assumption that it is distinctly different from any and all other species, and that its sexes are distinctly different from one another would be weakened substantially if one were able to understand all of its history at once (rather than appreciating just a single "time-slice" of that history).



4-2 Older species "time-slice"

Representation of a "time-slice" view of species, as described by Hull (2001, 206). This image represents the same evolutionary processes as those that are included in figure 4-1. In this image, however, the "time-slice" is further back in time, and so different, and fewer, groups are identified as species. This identification again overlooks the evolutionary past of these groups, as well as their future.

So, to say that the evolutionary past is irrelevant to the present differences between species and sexes is anthropocentric in a way that evolutionary theorists would likely reject. Biological science's rejection of anthropocentrism is not simply methodological, but also epistemological. Biology is not concerned with just human biology nor with just present biology. To arbitrarily choose a "time-slice," and by doing so ignore the evolutionary history of that species, is a way of thinking about the matter that is not compatible with evolutionary theory.

4.2.2 Second challenge: the gametic definition of sex

This section will discuss a second reason to think that essentialism about sex is wrong: specifically, the combination of the facts that the biological understanding of sex takes (1) sexual types to be determined by the gamete cells (sperm or egg) that an individual produces, and (2) the differences between these types of cells to be quantitative.

Unlike the folk understanding of sex, the biological understanding recognizes three different reproductive types. The following are definitions of these types of individuals, from Oxford University Press' *A Dictionary of Biology*:[3]

> Male: (2) (Denoting) an individual organism whose reproductive organs produce only male gametes. (Martin and Hine 2008c)
>
> Female: (2) (Denoting) an individual organism whose reproductive organs produce only female gametes. (Martin and Hine 2008a)

[3] The first and second definitions ("Male" and "Female") omit the first meaning that the dictionary includes because it identifies gamete type, rather than the reproductive type of an individual organism. Gamete types will be covered in the following discussion.

> Hermaphrodite: (1) An animal, such as the earthworm, that has both male and female reproductive organs. (2) A plant whose flowers contain both stamens and carpels. This is the usual arrangement in most plants. (Martin and Hine, hermaphrodite 2008b)

What is particularly interesting about these definitions is that they describe the concepts MALE, FEMALE, and HERMAPHRODITE by reference to the role or potential role that the individual has in reproduction. For the biological understanding, then, sex-as-an-activity is closely related to sex-as-a-type. The sexual types identified by the biological understanding are differentiated according to the gamete cell(s) that each produces (i.e., sperm or egg cells).

To appreciate the problems that a gametic definition of sex causes for the folk understanding, three questions seem to need answers. First, in what way or ways is a sperm cell different from an egg cell? Second, what are the similarities between all egg cells, such that 'egg cell' is a coherent category? And third, what are the similarities between all sperm cells, such that 'sperm cell' is itself a coherent category? The answers to these questions, especially for someone who holds the folk understanding, are probably disappointing. The following are definitions, also from *A Dictionary of Biology* of the different types of cells:

> Female
>
> Denoting the gamete (sex cell) that, during sexual reproduction fuses with a male gamete in the process of fertilization. Female gametes are generally larger than the male gametes and immotile. (Martin and Hine 2008a)

> Male
>
> Denoting the gamete (sex cell) that, during sexual reproduction, fuses with a female gamete in the process of

> fertilization. Male gametes are generally smaller than the female gametes and are usually motile. (Martin and Hine 2008c)

The reason these definitions are likely disappointing is because they pick out no essential property of either MALE or FEMALE. The difference between males and females is based upon the type of cells that each produces, and the cell-types themselves are understood to be relative.

The biological understanding, then, can be said to provide a gametic definition of SEX: if an individual produces sperm, that individual is male, if the individual produces ova, it is female. What is particularly important about the gametic definition is that gamete types are *relatively*, but *not essentially*, different. According to this understanding of sex, male and female gametes can be understood only by their relationship to one another, much like the number 17, as Rorty ([1994] 1999, 52 - 53) suggests, can be understood only by appreciating the relationships it has to other numbers. Because (1) the important difference between gamete types is size, and (2) size is relational, the biological understanding of SEX does not have, and would not endorse, essentialist understandings of MALE and FEMALE.

4.2.3 Third challenge: the occurrence of intersexuality

A final consideration will highlight the likelihood that essentialist thinking about sex is wrong: the occurrence of intersexuality, specifically in humans. There are numerous forms of human intersexuality; Table 1 provides a brief summary of four of these.

One of the basic beliefs of the folk understanding is that the concepts MALE and FEMALE are logically opposed; being one precludes the possibility of also being the other. Another basic belief of the folk understanding is that sex is

atomistic: whatever makes a male a male is indivisible, and one cannot be more or less male. (The same relationship is held with respect to being female.) The existence of human intersexuality undermines both of these beliefs, and with it, the suggestion that MALE and FEMALE are logically opposed.

	Chromosomal Sex	***Gonadal Sex***	***External Genitals***	***Internal Reproductive Organs***
Klinefelter's Syndrome	XXY	Small testes	Small penis and testes	Normal Male
Turner's Syndrome	XO	Streaks of ovarian tissue	Normal female	Underdevel-oped uterus and fallopian tubes
True Hermaphrodite	XX or XY	Testes and ovaries [or an ovotestis]	Variable	Variable
Androgen Insensitivity Syndrome	XY	Undescended Testes	Normal female genitals and a shallow vagina	Neither male nor female internal structures

Table 1 Four types of human intersexuality

This table was created by condensing and combining "Table 10.2: Characteristics of Klinefelter's Syndrome and Turner's Syndrome" (298) and "Table 10.3: Ambiguous Sex Characteristics Resulting from Hormone Abnormalities" (299) in (Miracle, Miracle and Baumeister 2003).

One might object to this line of argument by saying that intersexuality is so rare that it does not reveal anything about the accuracy of essentialist thought about sex. Blackless, et al., (2000) estimate that intersexuality occurs in just under 2% of the human population. With this criticism someone might have

in mind other congenital abnormalities and their inability to affect our concepts of normal human development. Someone might ask, why think that the occurrence of intersexuality suggests that the folk conceptualizations of MALE and FEMALE are flawed if one does not also think that a child being born without two arms, or without a brain, do not affect our concepts of normal human development? In response to this criticism I would emphasize that being born with fewer than two arms, or without a brain, are *not* conditions that combine two normal forms of human development. Intersexuality, on the other hand, *is* such a state. Human beings are normally born with all-male or all-female reproductive parts (something that, to my knowledge, has never been at issue). But the very possibility that a child might be born in a state that combines the two does indicate something about the relationship between these two normal types.

The infrequency of intersexuality does matter for a different reason though: namely because it helps to maintain the folk understanding of atomism. Under this assumption, sex is indivisible: one either has all of it all at once, or none of it. Because intersexuality does occur so infrequently, most people have no personal experience with it (or are unaware that they have). To put this positively, most people have experience with *only* homogenous collections of sex features (individuals with all-male components and individuals with all-female components). People base their beliefs, in large part, on the experiences that they have, and in regards to sex most people have experience only with sets of homogeneous features, i.e., sets of 'purely' male features and sets of 'purely' female features. They conclude from this that maleness and femaleness themselves have pure structures. Intersexuality obviously poses a problem for this assumption of the folk understanding. Intersexuality makes it plain that sex is no simple thing, and that its atomist structure is just an illusion – a faulty inference based on infrequency.

4.3 Conclusion

As this chapter has shown there is good reason to question the accuracy of the folk understanding because the belief in the existence of a female or a male essence might be just that: a belief. If the proponents of the folk understanding do in fact have more than mere belief, and could actually identify those features that are taken to establish the essence, there are still at least three good reasons to think that the whole essentialist venture in relation to sex (and other things) is flawed. If the folk understanding is flawed, as I have argued that it is, what understanding of sex could be taken up in its stead? The next chapter will examine different versions of the continuum view of sex that have been suggested as a replacement for the folk understanding.

Chapter 5

Alternatives to the Folk Understanding: Three Views

5.1 Introduction

The previous chapter argued that the occurrence of intersexuality undermines the assumption that the categories 'male' and 'female' are logically opposed. But does intersexuality illuminate anything else about the relationship between these concepts? In other words, what sense can be made of MALE and FEMALE, given intersexuality? Edward Stein (2001) identifies two possibilities. He writes, "we might give up the implicit premise that there are simply two sexes and say that there are *three* sexes: male, female and intersex" (29).[4] Alternatively, he suggests that "we might hold on to the picture that there are two sexes by giving up the implicit premise that there is a

[4] This option is one also suggested by Friedman (1996).

clear cut line between them" (29). The views of sex discussed in this chapter are built upon the second of these options.

Three different versions of the continuum view will be presented in this chapter. These are what I call: (1) *the basic continuum view*, (2) *the parallel continua view*, and (3) *the hybrid view*. Like the folk understanding each of these three views represents maleness and femaleness as opposites: the key difference between these views and the folk understanding is that they take these opposites to differ *continuously* from one another rather than *absolutely* as the folk understanding proposes.

5.2 The basic continuum view

Most of the support for the basic continuum view can be attributed to the works of Anne Fausto-Sterling. In a 1993 paper Fausto-Sterling suggested three new sexual categories that would classify the different types of intersexuality. In this paper she wrote:

> [T]he standard medical literature uses the term *intersex* as a catch-all for three major subgroups with some mixture of male and female characteristics: the so-called true hermaphrodites whom I call herms, who possess one testis and one ovary (the sperm- and egg-producing vessels, or gonads); the male pseudohermaphrodites (the "merms"), who have testes and some aspects of the female external genitalia but no ovaries; and the female pseudohermaphrodites (the "ferms"), who have ovaries and some aspects of the male external genitalia but lack testes. (21)

This paper is arguably the strongest statement of the basic continuum view of sex. In her later work *Sexing the Body*, Fausto-Sterling (2000) states that with

her suggestions of these categories she "had intended to be provocative, but had also been writing tongue in cheek" (78). Fausto-Sterling acknowledges that this point was lost on many (78 - 79).

Regardless of the intent behind her suggestion of the new categories 'merm,' 'herm,' and 'ferm,' Fausto-Sterling was undoubtedly committed to a continuum view of sex. In her 1993 paper, Fausto-Sterling stated "that sex is a vast, infinitely malleable continuum" and that "[b]iologically speaking, there are many gradations running from female to male" (21). Fausto-Sterling argued the same in later works as well. In *Sexing the Body* (2000) she writes:

> [I]f the state and legal system has an interest in maintaining only two sexes, our collective biological bodies do not. While male and female stand on the extreme ends of a biological continuum, there are many other bodies... that evidently mix together anatomical components conventionally attributed to both males and females. (31)

In response to the sex-testing that takes place in some professional sports (and which assumes, like the folk understanding, that the categories 'male' and 'female' are logically opposed), Fausto-Sterling (2000) writes: "A body's sex is simply too complex. There is no either/or. Rather, there are shades of difference" (3). Fausto-Sterling's co-authored paper "How Sexually Dimorphic Are We? Review and Synthesis" (Blackless, et al. 2000) also represents and speaks of sex as being on a continuum (162). In a simple visual representation included there, maleness and femaleness are represented as ranges along a single continuum; the space in which they overlap is indicated as representing intersexuality (162).

Other authors support the basic continuum view, but in lesser detail. Sharon Preves (2003), for example, states: "[D]istinctions between female and male bodies are actually on more of a continuum rather than a dichotomy. The criteria for what counts as female or male, or sexually ambiguous for that

matter, are human standards" (2 - 3). She also writes, "Because sexual anatomy occurs on a continuum, diversity and variety are to be expected" (157).

Suzanne Kessler (1998) also speaks of a continuum view of sex. In the following passage Kessler discusses continuity in terms of the normal occurrence of sexual features:

> We can think about variations in two very different ways. The first way is to note that most measurements of a feature cluster around the mean, thus creating a norm. The conventional medical view of intersexuality is that knowing the norms of a feature like phallic size, and knowing that most measurements cluster around the mean, validates the existence of underlying pathology when norms are not met. According to this view, genitals that vary from the norm mark a disorder... and treatment involves correcting both the deficiency and the marker. (8)

Kessler suggests the continuum view as an alternative: "A second way to think about variation is to see it as validating the continuum of the feature, thus providing proof that there are arbitrary categories and subjective markers of acceptability" (8). In these passages Kessler is speaking about variation in general, not sexual variation in particular. In terms of biological sex, variation simply means that some body parts are bigger in some people and smaller in others, some body parts are nonexistent in some people, combined in others, and singularly present in others still.

Intersex activist groups have also supported the basic continuum view. A particularly detailed description of this view appears on the website of The Intersex Society of North America (a group that is no longer active). In a section of their website that addresses questions about intersexuality, they include the following:

> Intersex is a socially constructed category that reflects real biological variation. To better explain this, we can liken the sex spectrum to the colour spectrum. There's no question that in nature there are different wavelengths that translate into colours most of us see as red, blue, orange, yellow. But the decision to distinguish, say, between orange and red-orange is made only when we need it...
>
> In the same way, nature presents us with sex anatomy spectrums. Breasts, penises, clitorises, scrotums, labia, gonads – all of these vary in size and shape and morphology. So-called 'sex' chromosomes can vary quite a bit, too. But in human cultures, sex categories get simplified into male, female, and sometimes intersex, in order to simplify social interactions, express what we know and feel, and maintain order. (Intersex Society of North America, 2011a)

The Organisation International des Intersexués (OII) also uses the continuum view in their description of their position on healthcare: "Our societies have accepted a binary construct between male and female which does not reflect Nature and the enormous variety of possible sexes which overlap one another in various gradations on a spectrum with male at one end and female at the other" (2011).

The image included below illustrates the basic continuum view (Figure 5 -1) based on Fausto-Sterling's (1993, 2000; Blackless, et al. 2000), Preves' (2003), Kessler's (1998), ISNA's (2011) and OII's (2011) statements about biological sex, and the folk understanding of biological sex that it replaces (Figure 5-2).

5-1 The basic continuum view, based on various descriptions

Representation of the basic continuum view of biological sex. In this conceptualization, MALE and FEMALE form opposite ends of the single continuum upon which all forms of sex are to be located.

5-2 Representation of the folk understanding

Basic representation of the folk understanding of biological sex according to which the concepts MALE and FEMALE are taken to be logically opposed. Unlike the continuum view represented in Figure 6-1, this conceptualization does not allow for gradation between MALE and FEMALE.

It should be noted here that Leonard Sax (2002) disagrees with Fausto-Sterling's estimate of the frequency of intersex conditions in the human population, as well as her description of sex as a continuum. It is also important to note that Sax sees the two as connected. Using his own, more conservative definition of intersexuality, Sax estimates that the frequency of intersex is actually 0.018% (177). Sax makes the contentious statement that "Fausto-Sterling's argument that human sexuality is a continuum, not a dichotomy, rests in large measure on her claim that intersex births are a fairly common phenomenon" (175). Sax concludes, "[t]he available data support the conclusion that human sexuality is a dichotomy, not a continuum. More than 99.98% of humans are either male or female" (177).

There are two reasons to question Sax's conclusion. The first of these is that the existence of fewer people with intersexual conditions does not undermine

a continuum representation of sex; all it does is reduce the "grey area" between the two sexes. And what Sax perhaps fails to notice is that the existence of any overlap at all *does* undermine the existence of a dichotomous difference. Furthermore, it is not clear that Fausto-Sterling's continuum view depends at all on the frequency, or even the occurrence, of intersexuality. Even without intersexuality the categories 'male' and 'female' can still each represent a range of configurations which, at one extreme, resemble each other.

5.3 Sex as a set of parallel continua

While proponents of the basic continuum view generally speak of sex as occurring on a single continuum that has MALE and FEMALE at opposite ends, the multiple continua view suggested by John Stoltenberg (1989) emphasizes the composite nature of sex, and the fact that its elements can vary independently.

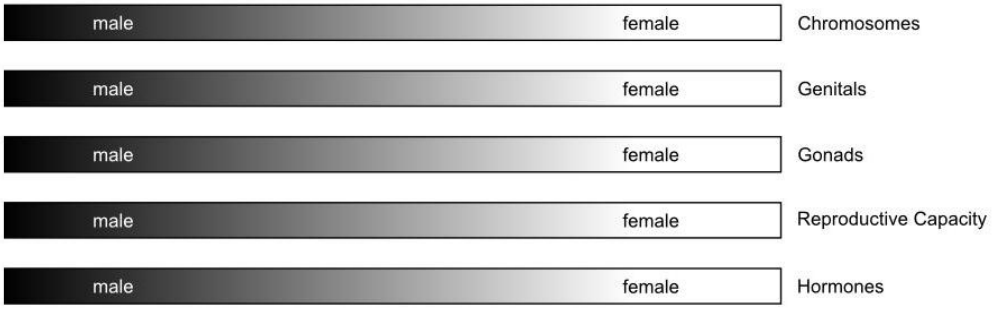
Stoltenberg asks us to imagine "creatures" which "know that they have been born in an infinite variety" (25). These beings "delight in the fact that they are not divisible into distinct categories" (26). Stoltenberg explains that these "creatures" have awareness of the existence of sexual variation among themselves (25 – 26). Of variety with respect to external genitalia, Stoltenberg explains, "Between their legs are tissue structures that vary along a continuum, from clitorises with a vulva through all possible combinations and gradations to penises with a scrotal sac" (26). Stoltenberg says that "[t]hey *have* sex. They do not have *a* sex" (27, emphasis in original). The point of this thought experiment is to demonstrate the social construction of the folk understanding

of sex. Stoltenberg states: "These creatures, in fact, *are us* – in every way except socially and politically" (28). He writes:

> We are born into a physiological continuum on which there is no discrete and definite point that you can call "male" and no discrete and definite point that you can call "female." If you look at all the variables in nature that are said to determine human "sex," you can't possibly find one that will unequivocally split the species into two. Each of the so-called criteria of sexedness is itself a continuum – including chromosomal variables, genital and gonadal variations, reproductive capacities, endocrinological proportions, and any other criterion you could think of. Any and all of these different variables may line up in any number of ways, and all of the variables may vary independently of one another. (28)

Figure 5-3 illustrates the conceptualization Stoltenberg describes. Each element Stoltenberg mentions has been placed on its own continuum, and together the set of parallel continua constitutes BIOLOGICAL SEX.

Using this model of sex, an individual's sex would be represented as a set of elements that each occur somewhere on the continuum that exists between MALE and FEMALE. The fact that this view allows for independent variation offers an important improvement over the basic continuum model, which uses just a single continuum to represent a person's sex. A single continuum will work for an individual whose features are *all* male or *all* female. The sex of an individual with a mixture of features, such as someone with Complete Androgen Insensitivity Syndrome (see Table One, Chapter Four) for example, would be given a misleading representation if it were represented by a single point somewhere between the two extremes. The parallel continua view that Stoltenberg speaks of can address this because it allows for the different features to vary independently. As the next section discusses, however, there are still reasons to think that this model could be improved.



5-3 The parallel continua view of sex, based on Stoltenberg's (1989) description

Representation of the Multiple Continua View of Sex, as suggested by Stoltenberg (1989). With this conceptualization, individual components of sex are *each* represented on a continuum individually, allowing for independent variation. The continua themselves place MALE and FEMALE at opposite ends and allow for gradation between the two.

5.4 The hybrid view

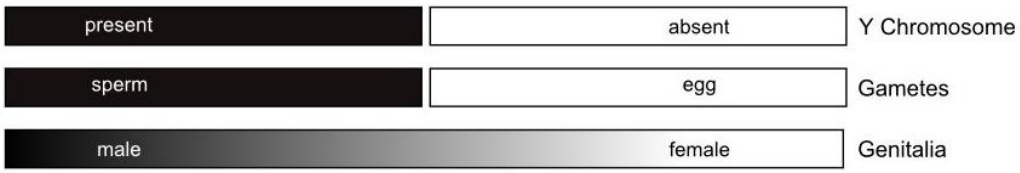
Comments made by Edward Stein (2001) and Alice Dreger (2004) offer yet another variation on the continuum view: what I call "the hybrid view." Stein suggests external genitalia as an example of a feature that can be represented upon a continuum, and the Y chromosome (which is associated with fetal development of male qualities) as an example of a discontinuous feature (p. 29 – 30). Alice Dreger's (2004) work *One of Us: Conjoined Twins and the Future of Normal* suggests a similar understanding of SEX. For example, she writes:

> [A]lthough the most widespread notion is that there are only two sexes, and although there obviously is one common cluster of anatomical variations we categorize as male and another we categorize as female, nature doesn't tell us where to draw the lines. Nature doesn't decide *how small a penis has to be before a newborn counts as intersexed instead of male*, and nature doesn't decide *that testes and a Y-chromosome makes an individual a male* even though androgen insensitivity makes the person look more

> classically womanly than most women. Search all you want for some particular gene, some particular chromosome, some particular hormone or brain-cell cluster – the fact is, *people* decide who will be grouped in what sex category, because it is important to do so for social reasons. (150, first and second emphases added)

I take these comments to suggest a view that I call *the hybrid view* of sex. I have called it this because this view seems to express a combination of the folk understanding's representation of sex, the basic continuum view, and the multiple continua view. Like the basic continuum view, the hybrid view allows for quantitative differences between the male and female variations of certain sexual elements. Like the multiple continua view, the hybrid view also allows individual features to be represented individually (and thus to *vary* individually). Unlike either of these views, however, the hybrid view takes certain features to be discontinuous. Because of the discontinuity that exists between the different sexual versions of these features, they are represented in the same way that the folk understanding takes sex itself to be represented.

Figure 5-4 presents a representation of this understanding of SEX.



5-4 Hybrid view, based on Stein's (2001) & Dreger's (2004) descriptions

Representation of the hybrid view of biological sex, which includes a mixture of both dichotomous features and graded features. Like the multiple continua view, this representation allows for sex to have components that vary independently from one another. Unlike both the basic continuum and the multiple continua view, this conceptualization allows some of those elements to differ qualitatively from one another, while recognizing that others will differ quantitatively. All elements are placed within a space that places MALE and FEMALE (or their corresponding characteristics) as opposites.

5.5 Conclusion

The three views summarized here represent alternatives that have been offered as replacements to the folk understanding of sex and its commitments to atomism, logical opposition, and group member homogeneity. If one is convinced that essentialist thinking about sex is flawed (as the previous chapter argued), then any of the three alternatives just summarized can be taken up in its stead.

As I will try to show in the next chapter, however, these three views are not the only alternatives possible. The next chapter will not only present a fourth alternative, the multidimensional model of sex, but it will also point out that each of the three views outlined here has important limitations.

Chapter 6

What is Sex?

6.1 Introduction

The preceding chapters have attempted to describe the basic beliefs of the folk understanding of sex, how they are flawed, and what alternatives have already been suggested as its replacement. In this chapter I will present my suggestion for replacement: a multidimensional view of sex.

Before presenting the model I will provide discussion of an important background idea: the similarities between intersexuality and androgyny, and Bem's (1974) reconceptualization of the latter.

6.2 Intersexuality and androgyny

Chapter 4 introduced the topic of intersexuality, a physical state in which an individual has both male and female sexual components, or a single sexual component that has both male and female characteristics, or both. To state the

point negatively, intersexuality occurs when the components of an individual's sexual system are not homogeneously male nor are they homogeneously female.

There are important and interesting similarities between intersexuality and androgyny. The similarities are so strong that the two concepts are often confused and conflated, much in the same way that the concepts SEX and GENDER themselves are confused and conflated by the folk understanding. Before highlighting the similarities between these two concepts, one must bear in mind a key difference between INTERSEXUALITY and ANDROGYNY: the terms *intersexual* and *androgyne* do not pick out the same people. It could happen that a person is both intersexual and androgynous, but being intersexual does not necessarily or even frequently entail being androgynous, nor does being androgynous entail or indicate intersexuality. To see why this is so, it is important to understand that androgyny relates to biological sex in a very different way than intersexuality does.

There are two general types of androgyny. One of these types has to do with appearance. People who have been called "androgynous men" (such as Boy George, David Bowie, and Prince) are individuals whose sex is not in question (as "men" here means "males"), but whose appearances are not strictly "masculine," by the judgment of society; similarly, people who have been called "androgynous women" (such as Marlene Dietrich, Madonna, and k.d. lang) are thought to be unquestionably female, despite their incorporation of 'masculine' elements into their wardrobe and other non-feminine adornments. In these cases, the combination of the person's sex (assumed to be strictly male or strictly female) and appearance (judged to be more masculine than it ought to be for females, or too feminine for males) is the basis for that person being described as androgynous.

The second general type of androgyny has more to do with personality than with appearance; as with the first type, however, people can be considered androgynous though their sex is thought to be clearly male or female. In other words, one does not need to know if a person is male, female, or some combination of the two before being able to say that that person is psychologically androgynous. A person's psychological state can be determined to be androgynous without any knowledge of the structure and arrangement of their sexual parts.

Because androgyny is a mental or behavioural state a person whose sex is clearly male or female (by the standards of the folk understanding) can be androgynous. Table 2 (below) summarizes some of these important differences between intersexuality and androgyny.

Intersexuality	**Androgyny**
Sex	Gender
Physical	Mental or Behavioural
Body	Mind or personality, appearance
Combination of both 'maleness' and 'femaleness' (either within the system, or within a component of the system)	Combination or expression of both 'masculinity' and 'femininity' (either in behavior or in appearance)
"Intersex Person" or "Intersexual"	"Androgynous Person" or "Androgyne"

Table 2 Comparison of intersexuality and androgyny

The work of social psychologist Sandra Bem (1974) on psychological androgyny has inspired the multidimensional model of sex I am presenting in this dissertation. Bem's work relates to the second type of androgyny mentioned above (psychological androgyny). Bem's paper begins by discussing the common understanding of psychological gender that she was about to challenge:

> Both in psychology and in society at large, masculinity and femininity have long been conceptualized as bipolar ends of a single continuum; accordingly, a person has had to be either masculine or feminine, but not both. (155)

Bem points out that since this conceptualization represents "an inverse relationship between masculinity and femininity" it cannot recognize androgyny as another possibility; androgyny is unintelligible (155). Bem's concern with a single continuum representation of psychological gender is that it is unable to make sense of androgyny, much as a continuum running from cold to hot is unable to represent something's being *both* cold *and* hot simultaneously. Christopher Kilmartin (2000) represents this understanding in Figure 6-1.

6-1 "A Bipolar View of Gender Role Identity" from Kilmartin, 2000, 35.

Bem sought a way to conceptualize masculinity and femininity that did not presume this sort of relationship; the "Bem Sex Role Inventory" (BSRI) is the psychological test that corresponds with this reconceptualization. The BSRI uses a set of psychological traits to determine whether a person is

psychologically masculine, feminine, or androgynous. Bem (1974) explains that,

> [t]he Masculinity and Femininity scores of the BSRI are logically independent. That is, the structure of the test does not constrain them in any way, and they are free to vary independently. (159)

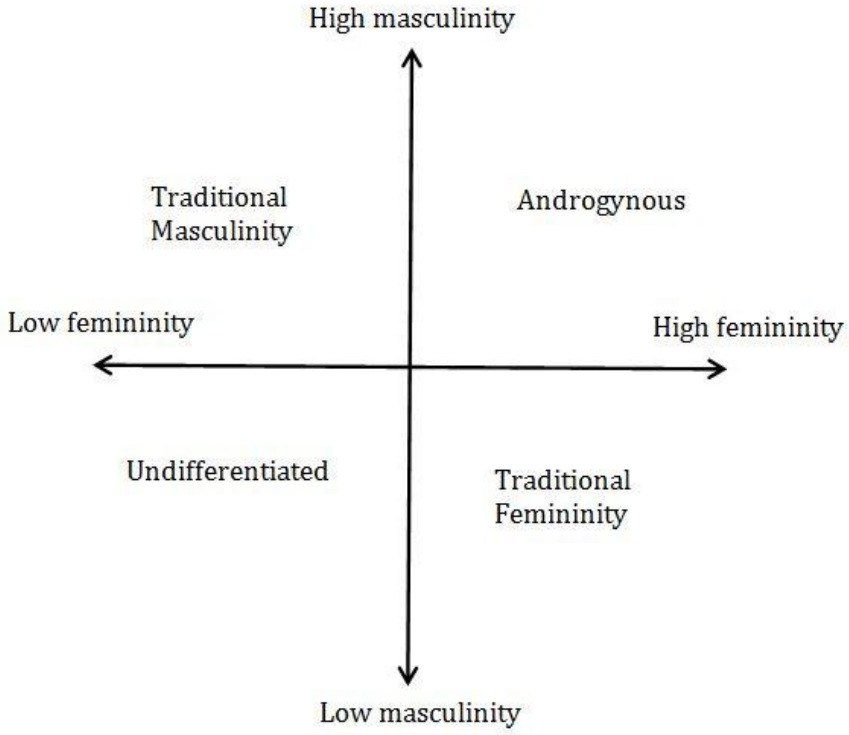
What Bem means by this is that the new reconceptualization meant a person no longer had to become *less* feminine in order to become *more* masculine, or *less* masculine in order to become *more* feminine. Masculinity and femininity were no longer related to each other in the way that HOT is related to COLD; instead, they were related to each more in the way that the concepts HEIGHT and WIDTH are related to one another. A thing can become wider or narrower without its height necessarily changing; also, knowing that a thing's width has changed does not also provide the knowledge that its height has changed as well. The two might happen to be related on some occasions, but they are not related by necessity.

Kilmartin (2000) provides an image to represent the way that Bem reconceptualized androgyny, and the relationship between masculinity and femininity at work therein (See Figure 6-2). Bem argued that the relationship between a person's psychological traits determines that person's category:

> the BSRI characterizes a person as masculine, feminine, or androgynous as a function of the difference between his or her endorsement of masculine and feminine personality characteristics. A person is thus sex typed, whether masculine or feminine, to the extent that this difference is high, and androgynous, to the extent that this difference is low. (156)

Although Kilmartin's image includes the category 'undifferentiated' this was not suggested by Bem in her initial writing on psychological androgyny. Spence, Helmreich & Stapp (1975) proposed this important modification to

the BSRI; they suggested persons who possess only a few of each type of psychological trait be categorized as "undifferentiated" (35). In a later co-authored paper, Bem accepted this modification, stating "the term *androgynous* should henceforth be reserved only for those individuals who score high in both masculinity and femininity" (Bem, Martyna and Watson 1976, 1023). More recently Woodhill and Samuels (2004) suggested that the categories be further refined to reflect that there is "desirable androgyny" and "undesirable androgyny" since masculine and feminine traits can themselves be positive or negative.



6-2 "Masculinity and Femininity as Independent Dimensions" from Kilmartin, 2000, 35.

The basic conceptual structure that Bem describes and Kilmartin represents also suggests a new way to understand biological sex: an understanding that, once the structure is modified in certain ways, can represent an individual's sex as a pattern of components that occur within a space created by the intersecting continua $Male_C$ and $Female_C$.

6.3 A multidimensional model of sex

6.3.1 Basic structure

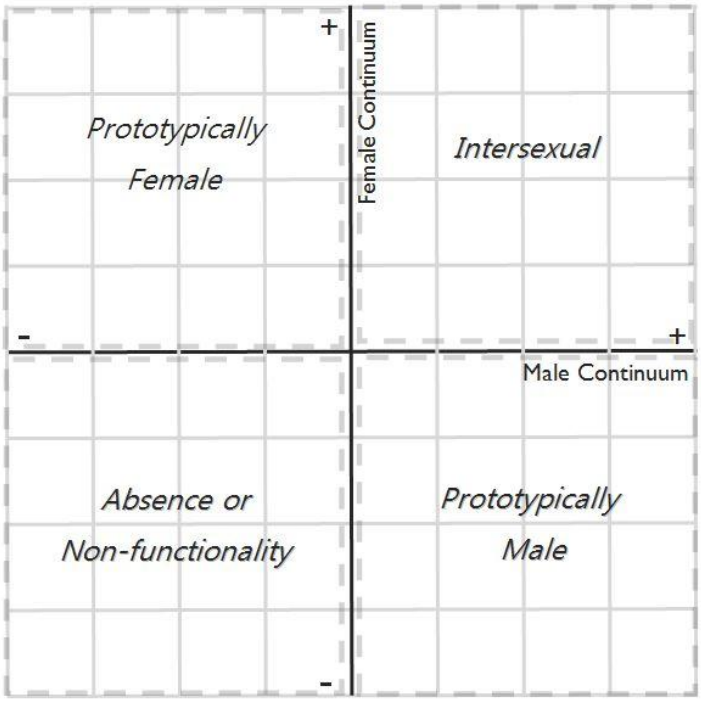
A multidimensional model of sex inspired by Bem's reconceptualization of psychological androgyny will represent sex as occurring within the space created by the intersection of male and female continua (see Figure 6-3), just as Bem's reconceptualization represented androgyny as being located within the space created and divided by masculinity and femininity. Separating maleness from femaleness allows the two to be measured independently, as masculinity and femininity were by Bem; doing so also simultaneously rejects the folk understanding's assumption of logical opposition. Changing the meaning of the two dimensions also changes the meaning of the quadrants they create. The quadrants created by intersecting male and female continua are (1) prototypically female (2) intersexual (3) prototypically male and (4) absence, or non-functionality.

Along with changing the meaning of the continua and the quadrants they produce, a major difference between the two models is that Bem's reconceptualization identifies a person's psychological type by *a single point* located somewhere within the space bound by the dimensions of masculinity and femininity. Biological sex, on the other hand, is not simple; it is not just one thing that can be given just one measurement or just one representation.

An individual's sex will be the complete image created by the representation of each component within the model. Using this model, an individual's sex can be understood to be *multidimensional*: as being the composite of separate points represented on the space created by two intersecting continua, one which represents the continuity between presence and absence of femaleness, and the other which represents the continuity between presence and absence of maleness. No single point is itself the person's sex, and each point of the composite will simultaneously represent both the presence or absence of maleness *and* the presence or absence of femaleness exhibited by that single feature.

Individual components themselves could be represented by a single point. Where this point is located depends upon the characteristics that the particular component expresses. In relation to individual components, the same sort of method as that which Bem used in relation to androgyny could be used to determine the proper location of the component. If, however, it turns out that a particular component has two different values (say, if a person has both a male gonad and a female gonad), then this single feature could be given double representations, in order to indicate that the individual simultaneously has *both* a prototypically male gonad *and* a prototypically female gonad. What is important to note is that along with a double-representation such as this, it is also possible to represent a single feature as *simultaneously* male and female (as may be best for the representation of an organ such as an ovotestis, described as "an organ with both ovarian and testicular attributes" [Dreger 1998, 36]).

All of this being said, in many species, including *Homo sapiens*, it will frequently appear as if an individual's sex can be represented by a single point. This representation will occur whenever each individual component of a set



6-3 Basic structure of a multidimensional model of sex

Representation of the different spaces created by the dimensions $Male_C$ and $Female_C$. Where femaleness is highest and maleness lowest (upper left quadrant), elements that are prototypically female will be represented. Where maleness is highest and femaleness is lowest (lower right quadrant), elements that are prototypically male will be represented. A feature that is both highly male and highly female will be represented in the upper right quadrant. If a feature is neither male nor female, or if it is absent, or non-functioning, it will be represented in the lower left quadrant.

has the same combination of male and female characteristics. In such cases, the multiple points will occur in the same space, and could suggest that the individual's sex is a single, simple thing, just as the folk understanding conceives of it. Bearing this in mind while trying to use the model will help to avoid the conceptual oversimplification of sex, a system of interrelated but independently varying components, even when it *appears* that an individual's sex is just one thing. As discussed in Chapter 4, what frequently appears to us

to be the case, and what we strongly believe to be the case, might actually turn out to be otherwise.

6.3.2 What components should be represented?

Components of an individual's sexual system will be represented within the space created by the intersection of the two continua $Male_C$ and $Female_C$. What are the components that are to be given representation? In this chapter I will limit my discussion to a species-specific representation of sex, and so, I will focus on those components found in the sexual system of *Homo sapiens.* (The components included in the systems of other species may be different.) I believe that, at a minimum, the representation of a person's sex ought to include individual representation of external genitalia, gonads, chromosomes, and gamete type on the chart. These components ought to be included because they are known to have either male or female features or both, because they are known to co-function, and because they are each known to be importantly related to reproduction. Should it turn out that some other feature is found to be important, it can also be represented.

I should note here that I have consciously chosen not to include secondary sex characteristics (such as the distribution of body and facial hair, typical muscle strength, height, weight, and general body shape) in my discussion of the multidimensional model. I have made this choice because such characteristics, I believe, are very unlikely to be considered to be determinants of a person's sex whether sex is understood from the folk understanding, any of the continuum understandings, or the multidimensional understanding.

6.3.3 *Expected ranges of variation*

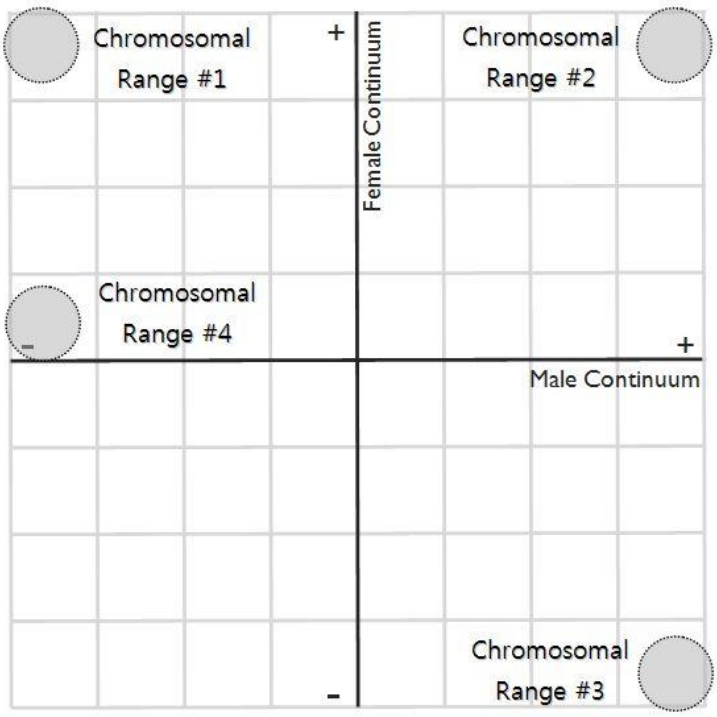
Although this model provides a new way to represent sex, it does not *reinvent* sex. In other words, use of the multidimensional model would not require people to change all of their expectations about sex. Dreger (1998) for example, says, "Certainly we can observe some basic and important patterns in the bodies we call 'male' and the bodies we call female" (9). Because there is such regularity around us, people can also predict, with a high degree of accuracy, what they are likely to see in relation to each of the components just suggested.

Of the four components just suggested, the representation of chromosomes and gamete cells will likely display the least amount of variation between the prototypical male and female varieties. The word *chromosomes* refers to the possession of an XX chromosomal pair (categorized as 'female') and an XY chromosomal pair (categorized as 'male'). Figure 6-4 represents the areas within the model where one can expect a person's chromosomes to be represented. XY chromosomal pairs are represented in the lower right quadrant, exhibiting a high degree of maleness, and a low degree of femaleness; XX chromosomal pairs are represented in the upper left quadrant, exhibiting a high degree of femaleness, and a low degree of maleness. Individuals with Klinefelter's Syndrome may have their "sex" chromosomes, which are XXY, represented in the upper right quadrant, meaning that they are highly intersexual (which is, because of the structure of the model, simultaneously saying that they are both highly male and highly female). Individuals with Turner's Syndrome may have their "sex" chromosomes, which are XO, represented at the midpoint of the female continuum, and at the lower end of the male continuum; such placement would indicate that the chromosomal pair is not male, though also not prototypically female.

Someone might argue that in cases of intersexuality that involve chromosomal variation, such as that which occurs with Klinefelter's Syndrome and Turner's Syndrome, the chromosomes ought to be given a double representation. If this were the case, the chromosomes of someone with Klinefelter's Syndrome would be represented in both the prototypical male and prototypical female quadrants; the chromosomes of an individual with Turner's Syndrome would be represented in both the prototypical female quadrant and in the quadrant reserved for absent or non-functioning components.

The reason that chromosomes should not be given a dual representation is because to do so would overlook the fact that such chromosomes interact. An individual with Klinefelter's syndrome does not have both male and female chromosomal pairs, but instead has a trio of sex chromosomes; to represent the trio as if they were really two pairs would artificially divide them.

A different concern can be expressed with regards to dual representation of the chromosomes of individuals with Turner's Syndrome. If each chromosome were given a single representation, then the chromosomal pair XO would be represented as prototypically female and absent. Applying the same principle to the representation of the chromosomal pair XY, however, would also mean it is identified as both prototypically female (in relation to the X) and prototypically male (in relation to the Y). Because of puzzling results like this, I do not think that artificially dividing the chromosomal pair, and providing separate representations for each chromosome would be functional within this model. The representation of gamete cells will also involve minimal variation, but will be more straightforward than chromosomal representation. The female gametes (ova) and the male gametes (sperm) will

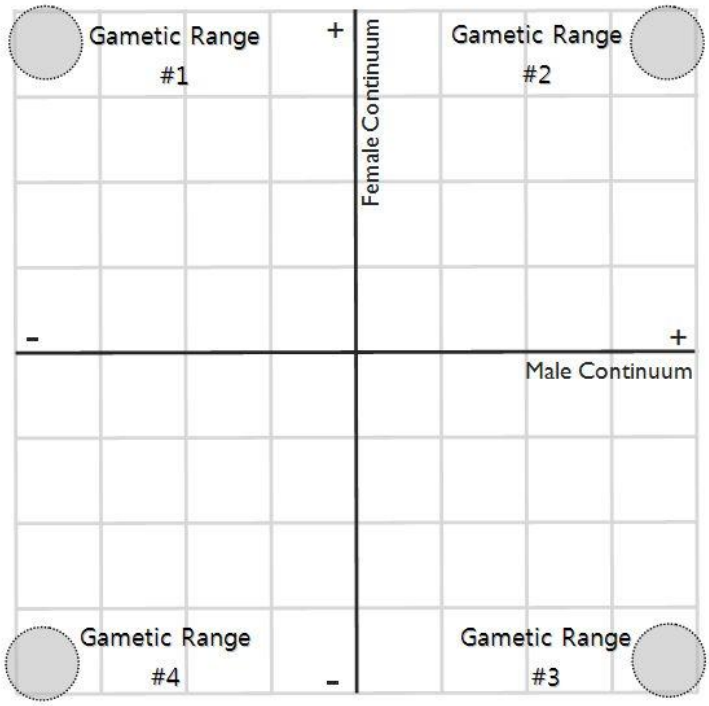


6-4 Expected chromosomal ranges

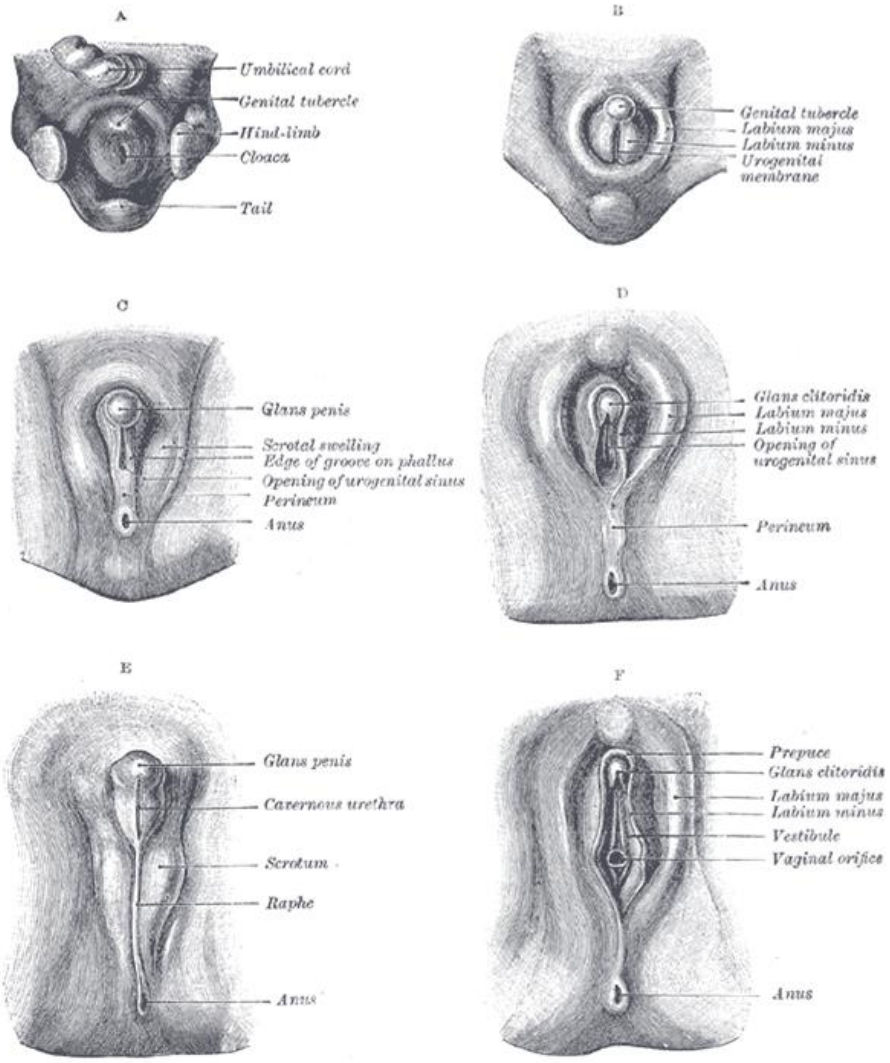
be represented in the prototypically female and prototypically male quadrants, respectively. Should a person produce both sperm and ova, this could be represented in both the prototypically female and the prototypically male quadrant. If the person did not produce any gamete cells, this would be represented as absence in the lower left quadrant. These ranges are represented in Figure 6-5.

Much more variation can be expected in the representation of the external genitalia and the gonads. Prototypically female external genitalia, including labia minora and majora, clitoris, and vagina, would be given a single representation in the upper left quadrant. Prototypically male external genitalia, including a penis and scrotum, would be given a single

representation in the lower right quadrant. It is highly unlikely, if not impossible, that the configuration of an individual's external genitalia would result in representation in the upper right, intersexual quadrant. This unlikelihood is due to the fact that a continuum *does* exist between the typical female variation and the typical male variation of external genitalia; in just the case of the external genitalia (though *not* in relation to other components under consideration), it makes sense to infer that the *more male* external genitalia are the *less female* they are, and vice versa. This continuum exists because female and male external genitalia began *in utero* as the same thing (see Figure 6-6), and more regularly than other sexual components, do not completely differentiate into the prototypically male or female types.

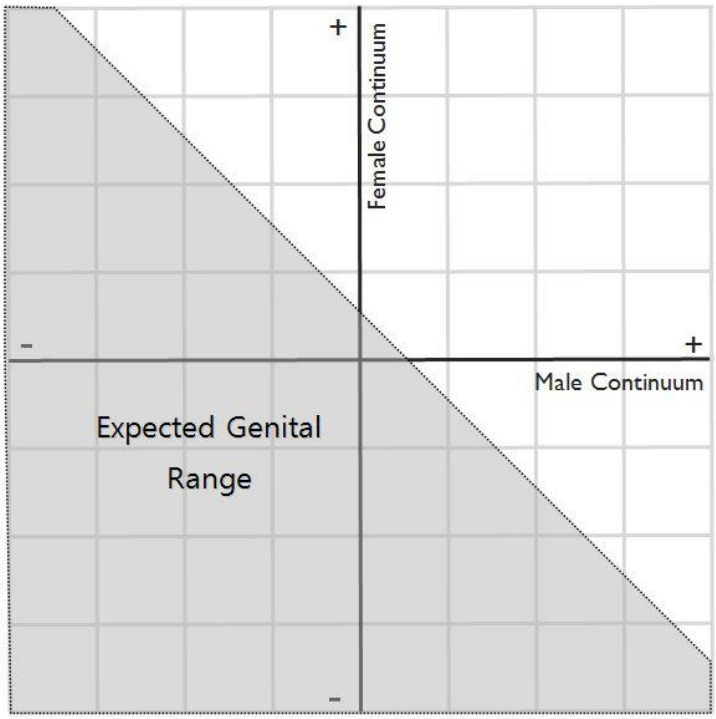


6-5 Expected gametic ranges



6-6 "Stages in the Development of the External Sexual Organs in the Male and the Female" (Gray [1918] 2000).

Drawings from Henry Gray's ([1918] 2000) *Anatomy of the Human Body* illustrating the differentiation, *in utero,* of common tissue into either male or female external sexual organs.



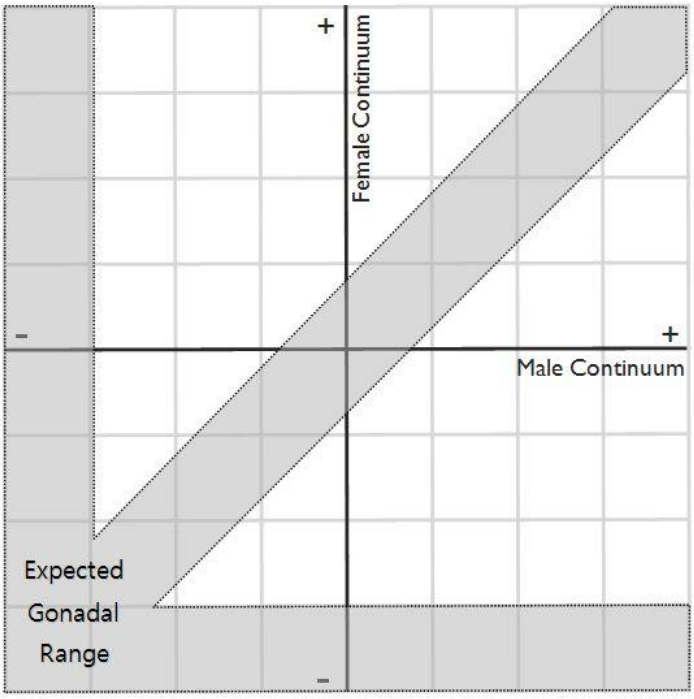
6-7 Expected genital range

Given the common origin of the female and male external genitalia the range of variation expected for this feature will extend from one extreme end of prototypicality to the other, in addition to the range that represents absence and nonfunctionality (see Figure 6-7). Should an individual's genitalia vary from the two most typical configurations, they almost certainly will exhibit a mid-state somewhere between the two rather than a combination of the prototypical varieties of the two.

The fourth component, gonadal type, can be expected to exhibit the most variation out of the set (though variation of this component will likely occur less frequently than in others). The prototypical male and female gonads, testes and ovaries, would be given representation in their respective quadrants.

If an individual has a single ovotestis, this would be given representation in the upper right hand corner, as that gonad would be both highly male and highly female. Should an individual have a poorly functioning, underdeveloped gonad of any type, this will be indicated somewhere in the lower left quadrant; where exactly will depend upon the relative male and female qualities of the gonad. If the individual has no gonads whatsoever, this will be represented in the lowest and leftmost point in the lower left quadrant (see Figure 6-8).

In cases where an individual has both an ovary and a testicle, the same question arises as to whether or not the gonads should be treated as a single entity and given a single representation, or as separate components each with its own representation. When this question arose before, I argued that chromosomal pairs should be given a single representation; with regards to gonads, however, it seems to make the most sense to provide a single representation when the items of the pair 'match' (i.e., are both female, both male, or both are ovostestes), and a double representation when they do not. The reason for this difference is found in the relationship between the items of the chromosomal pairs, and the relationship between the items of the gonadal pair (if there is such a pair) when these occur in their prototypically male and female forms. The difference that *makes* the difference is this: in their prototypical occurrences gonadal types will match, but the same is not true of prototypical chromosomal pairs. With chromosomal pairs, the quality of 'matching' is characteristic of the female type, while being *mis*matched characterizes the male form.

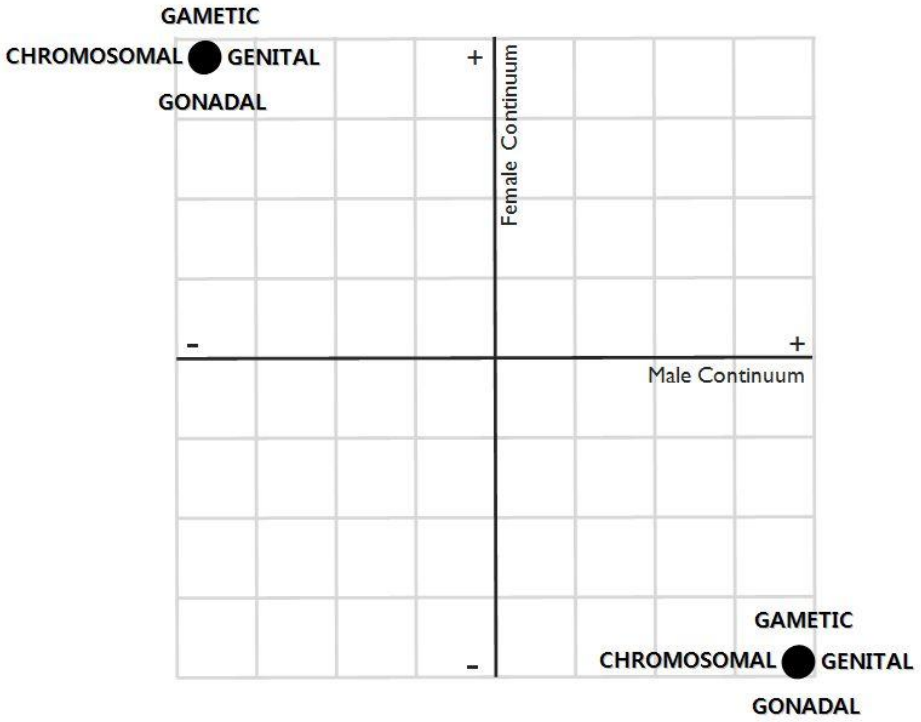


6-8 Expected gonadal ranges

6.4 Examples

This section of the chapter will discuss three examples in order to show how the outlines discussed above might be applied to actual individuals. Before considering examples of non-ordinary sex, it will help to reconsider the prototypical male and the prototypical female representations (see Figure 6-9). These representations show how the alignment of components can give the impression of atomism: the fact that the chromosomes, gametes, external genitalia and gonads of each individual's sex neatly group together in these representations obscures the fact that they are actually separate components. It is when these components occupy different spaces in the model, when the

prototypical versions of sex disintegrate, that the necessity and advantages of a multidimensional model are revealed.



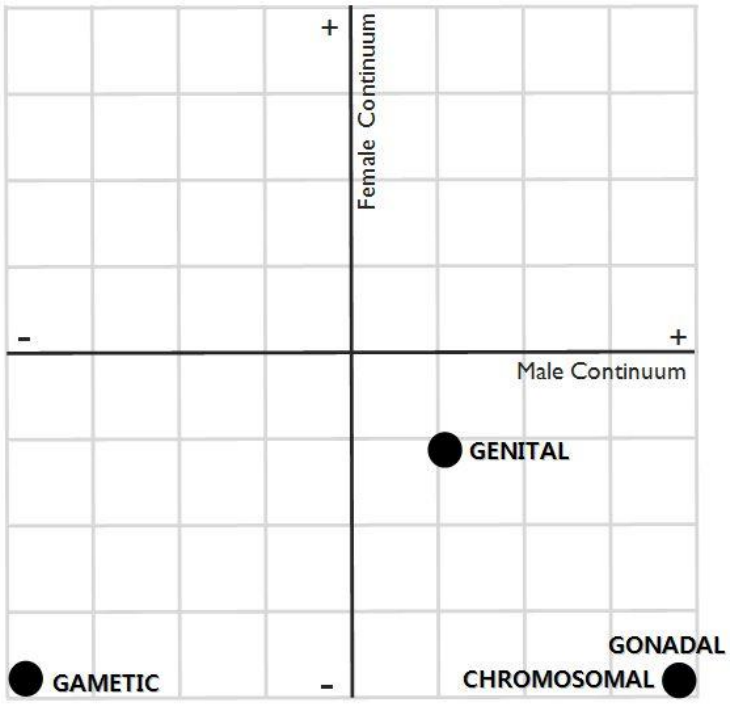
6-9 Prototypical male and prototypical female sex represented on the multidimensional model

The first example (Figure 6-10) represents the sex of an individual who has a condition called "Partial Androgen Insensitivity Syndrome" or "PAIS." Dreger (1998) describes the mechanism behind this syndrome as follows:

> In AIS [Androgen Insensitivity Syndrome], the testes produce the usual androgens effective in male development. The body lacks a key androgen receptor, however, and so the body cannot "hear" or "read" the androgen ("masculinizing") messages. Therefore, rather than developing along the typical masculine developmental pathway, the tissues develop along more "feminine lines." (38)

With *Partial* Androgen Insensitivity Syndrome individuals "can have normal female sex characteristics, both male and female sex characteristics, or normal male characteristics" (U.S. National Library of Medicine 2008). The representation displayed in Figure 6-10 would be accurate for an individual who has XY chromosomes, testicles that do not produce gametes and a mild form of what is sometimes called "feminized" genitalia; this individual's penis may be small, the scrotum may not be completely fused, and the urethra may be somewhere *other* than at the end of the penis. If the individual had more severe "feminization," (say, if the scrotum were only very slightly fused, and the penis were very small) then a representation closer to the prototypical female representation (and simultaneously *further* away from the prototypical male representation) may be more appropriate. It should be noted that at some point it becomes unclear whether what is being described is "feminized" male genitalia, or "masculinised" female genitalia, a so-called "micropenis" or a case of "cliteromegaly." Fausto-Sterling discusses this in *Sexing the Body* (2000, 56 – 62) and the Intersex Society of North America (2011b), for example, states in a their description of Partial Androgen Insensitivity Syndrome that "the clitoris is large or, alternatively, the penis is small."

When the level of insensitivity involved in AIS is said to be "complete" affected individuals will "have the external sex characteristics of females, but do not have a uterus and therefore do not menstruate and are unable to conceive a child" (U.S. National Library of Medicine 2008). Dreger (1998) explains that individuals with this form of AIS "seem to fit the dominant feminine ideal in the United States today better than most medically 'true' females" (38). Figure 6-11 represents the sex of an individual who is affected by this form of AIS. As with the previous example, chromosomal pair and gonads are represented as being prototypically male: XY and testes.

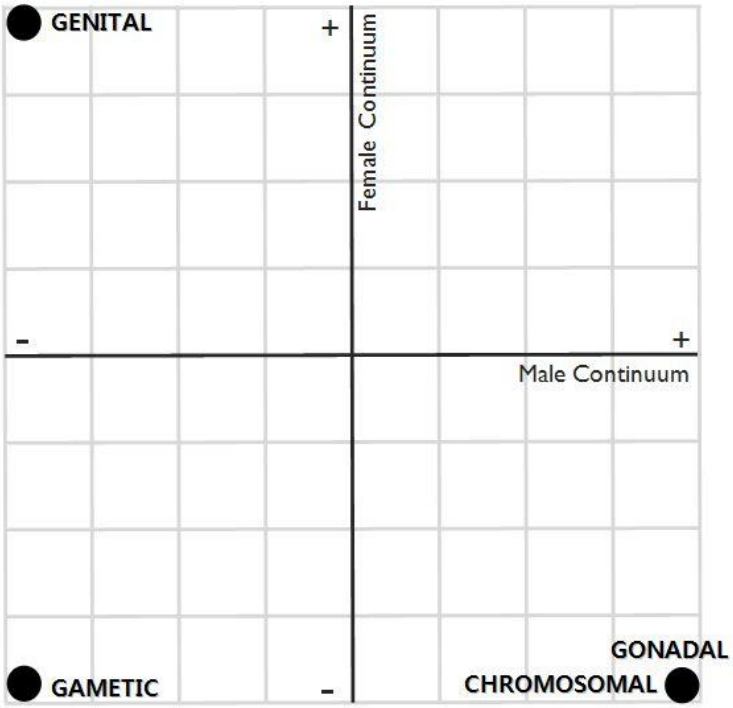


6-10 Example 1 - Individual with partial androgen insensitivity syndrome

This individual has both testes and an XY chromosomal pair, which have been located in the lower right quadrant. Because this hypothetical individual has ambiguous external genitalia that exhibit some female and some male qualities, this is located still in the lower right quadrant (assuming that the genitalia are, overall, more male than female), but closer to the intersexual and prototypically female quadrant. Since this individual does not produce gamete cells, gametic sex is located at the furthest point in the lower left quadrant.

Again it is assumed that the testes do not produce sperm, and so gametic sex is represented in the lower left quadrant. This individual's genitalia would be prototypically female, and represented in the corresponding quadrant, since this individual has complete androgen insensitivity syndrome.

The final example to be discussed in this section is the representation of sex given for an individual who has "feminized" male genitalia (i.e., genitalia that resemble the prototypical male version more than the prototypical female

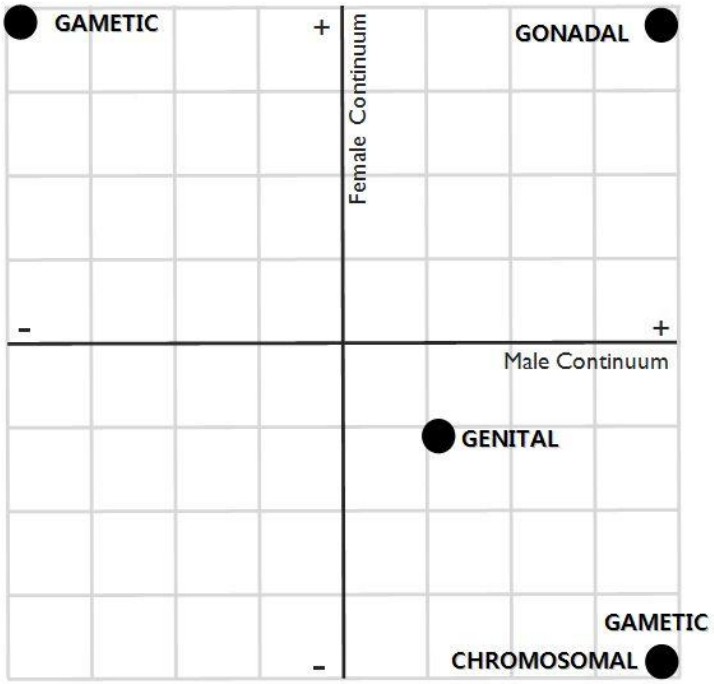


6-11 Example 2 - Individual with complete androgen insensitivity syndrome

The sex of this individual is identical to the sex of the individual represented in figure 6-10 except for the representation of external genitalia. This individual's external genitalia are represented at the furthest point of the top left quadrant because they are prototypically female.

version, but are, taken together, not prototypically male), an ovotestis that produces both sperm and ova, and the prototypically male XY chromosomal pair (see Figure 6-12). Two things set this example apart from the previous two, as well as from the ordinary male and female groupings. This individual's gonadal sex is represented by a single point in the intersexual quadrant; having only one gonad, and this gonad being itself a both male and female, it is properly represented in the upper right hand quadrant. Since it is assumed in this case that this gonad produces both types of gametes, these are represented by separate points in the two prototypical quadrants; there is no

single gamete that is somehow both egg and sperm so as to justify giving the gamete cells of this individual a single representation.



6-12 Example 3 - Individual with functioning ovotestis and feminized male genitalia

Because this hypothetical individual has a functioning ovotestis, gametic sex will require double representation. Gonadal sex, because in this case it refers to a single organ (rather than an ovary and a single teste) would require a single representation at the further point of the intersexual (top right) quadrant. If this individual had had an ovary and a testicle (instead of an ovotestis), then this could have been represented the same way as gametic sex in this example.

6.5 Discussion of the model

6.5.1 Parts, not people

According to the folk understanding, sex is a whole-person category; the word *female* is applied to people at the same level as words like *parent* or *scientist* or *artist*. Discussing sex as if it were a whole-person category presumes that there is such a thing as "*a* female" and "*a* male." Such an understanding, I think, is based upon the flawed beliefs in atomism and logical opposition: people are thought to be one or the other, and whichever one they are, they are that type *completely*.

The multidimensional model of sex I have just described does not presume that the words *male* and *female* have meaning *beyond* the individual components that they describe. In other words, there is no sexual type that is greater than the individual parts. If an individual has components that are all accurately described as prototypically female (i.e., ovaries, external female genitalia, XX chromosomal pair, and ova) then that is the total of the person's sex: the components of the set do not create some higher-level meaning once they are grouped together.

The prevalence of the folk understanding, as well as the fact that there is generally a one-to-one correspondence between consciousness and human bodies, likely work together to create the impression that there is a property that emerges from the combination of the parts themselves. We, as human beings, experience the world from inside one body, and in almost all cases, that body will have sexual components that are homogenously male or female.

So, the question remains: can the multidimensional understanding of sex described above make sense of statements like "Sue is a female" or "Bob is a male"? The answer, I think, is no. Using the multidimensional model, the

concepts MALE and FEMALE apply to individual features; the fact that most people have parts that can be similarly described does not justify the further conclusion that there is some type of which that person, as a whole, is. There is, I believe, no sex that is more than the sum of its parts: there are just the individual parts that are themselves best described as "male," "female," or "both" (i.e., intersexual).

6.5.2 Interspecific use

Not only people have biological sex, of course. Sex, maleness, and femaleness all exist in non-human forms in non-human individuals. Could the non-human forms of sex be effectively spoken of using the multidimensional model? Can someone who is speaking about non-human biological sex successfully use a model that suggests maleness and femaleness be spoken of at the level of parts or features, but not at the level of the individual?

I think that the multidimensional model, if widely adopted, would be capable of effectively and successfully representing the biological sex of any species that reproduces sexually. To demonstrate why I think this is the case, two topics need to be considered: 1) what reasons there are to think that the multidimensional model can be used beyond human versions of biological sex, and 2) how it might actually be used to do so.

There are at least two reasons to think that an understanding of sex that speaks of maleness and femaleness at the level of parts rather than at the level of individuals could be used effectively in biology. The first of these reasons stems from the definitions of *male, female,* and *hermaphrodite.* In Chapter 4 definitions of these terms were provided which identified sex by the type of gametes produced by an individual's reproductive organs (Martin and Hine, 2008a, b, c). What these definitions suggest is that when the focus of

discussion is not on a single species, sex is *already* spoken of in biology at the level of individual features (i.e. the type of cell produced) not at the level of the individual (i.e. the individual that produces those cells). Secondly, when biologists do speak of a single individual as being "a male" or "a female" or "a hermaphrodite" they are using these terms with a species-specific meaning in mind. To clarify this statement, consider the following discussion of sex categories:

> Typically we refer to males and females as different sexes. There are many differences between the sexes, for example, in size, colouration, sexual organs, and parental care. Yet none of these are consistent differences across the range of animal and plant species. The only consistent difference between the two sexes is size of the gametes: males produce small gametes (sperm or pollen), whereas females produce large gametes (ova or more technically oocytes) (Hurst 2003).

What this definition suggests is that whatever is being claimed beyond gamete type about "a male" or "a female" is going to be a statement about the particular species under consideration, and not about sex as it exists independent of that species; this is to say that when a biologist speaks about "a male" or "a female" *of* a species, they are also speaking about "a male" or "a female" *for* that species. Since the conceptualizations already being used in biology categorize sex based on the possession of certain parts by that individual (i.e. parts that produce sperm or ova at a minimum), and since any further statements about maleness and femaleness are going to be species-specific, it is likely that biologists could use the multidimensional model without any great adjustments to theory or practice.

How *would* the model be used if biologists were to use it? Its exact use would have to be determined by those familiar with the species being represented, and how sex is configured within the bodies of individuals of that

species. For example, what would count as "normal" external genitalia for a particular species would have to be determined by those who study that species. Consider, for example, the following description of the female external genitalia of certain non-human primates that,

> have an exaggerated clitoris that can be as long as or even longer than the penis, and, in these cases, is pendulous like a penis. The clitoris is, just like the penis, perforated by the urethra in the centre… The clitoris is especially similar to the male penis in *Varecia Variegata* and *Galago Crassicaudatus.* The similarity of the clitoris and the penis makes a visual sex determination at a distance almost impossible. (Ankel-Simons 2007, 523)

Clearly what is prototypically female for these primates is not what is prototypically female for human primates. The multidimensional model could represent this, as those familiar with the particular species under consideration would be the ones to judge what *is* prototypically male or female *for* that particular species.

Those familiar with other species might use the model to show that there is no prototypically female or prototypically male groups of features in that species. Consider, for example, *Caenorhabditis elegans (C. elegans)*, a worm species in which there is no individual with only female features (Herman 2005). In addition to individuals with only male features, *C. elegans* also has hermaphroditic individuals, described as,

> a modified female that in the fourth larval stage makes and stores sperm to be used later to fertilize oocytes produced within the gonad of the same animal after spermatogenesis is finished. (Herman 2005)

Were biologists to use the multidimensional model to represent the sex of members of this species, some features might be represented within the

prototypically female quadrant, but no single *individual's* sex would be completely represented there.

For other species chromosomal sex might be of very little importance, or of different importance than it is in the representation of human sex. The Y chromosome in *Drosophila*, for example, is not involved with 'maleness' in the same way that it is in human beings, since in that species "it is not involved in determining sex" (Gilbert 2000). As another example, one can consider *C. elegans* again, which has two chromosomal sexes: XX (in the case of the hermaphroditic, or "modified female" individuals) and XO (in the case of individual with only male sexual features) (Zarkower 2006). For use with any particular species the model would have to be tailored to reflect what sex is like for the species being represented; and our knowledge about what sex is like for that species could change as well. For example, one can consider an article by McLachlan and Storey (2003), who suggest that sperm in mammals (which will determine the chromosomal sex of offspring) might be susceptible to temperature effects; this sensitivity, if it does exist, could shed light on what they call the "distinctly odd" reality that male gonads in human beings (and other animals) are normally located *outside* the body, unlike any other organ (71-72). If it could be shown that McLachlan and Storey are right, then perhaps the multidimensional model's representation of human sex would have to be adapted in order to show that the chromosomal pairs are not, by themselves, prototypically male or female.

So although the suggestion that sex be spoken of at the level of parts rather than at the level of the individual might seem uncomfortable, especially to biologists, it needs to be recognized that this is much like the way they speak about these things already. To call an individual of a particular species "a male" or "a female" is really just a shorthand way to say that the individual has those parts that in that species usually go along with the production of

sperm or ova, respectively. The multidimensional model's further suggestion that this underlying meaning be made explicit would, I would think, be a reasonable request.

6.5.3 The multidimensional model maintains maleness and femaleness

Someone might ask why the two continua that form the foundation of the multidimensional model are still named "male" and "female," if they do not mean male and female in the way that the folk understanding understands them. The concern might be described as follows: if the folk understanding is mistaken, and it takes male and female to be the only two possible categories of sex, why use the words *male* and *female* to refer to the basic structures of the multidimensional model? Would it not be better to adopt a new name that is not weighed down by these connections with the folk understanding?

This sort of concern is much like one that feminist philosophers who were arguing in favour of androgyny faced. Speaking about this possible criticism of ANDROGYNY Mary-Anne Warren (1982) wrote:

> It might be argued that the concept of psychological androgyny is self-defeating; while it suggests the elimination of the sexual stereotyping of human character, it is in itself formulated in terms of the very concepts of "femininity" and "masculinity" which it urges us to abandon. Is it not at least mildly paradoxical to urge people to cultivate both "feminine" and "masculine" virtues while at the same time holding that virtues ought not be sexually stereotyped? …To go on calling these traits "masculine," even in the process of urging women to develop them, seems to risk encouraging the assumption that it is, after all, easier and more natural for men to do so. (181)

One could frame a question about the multidimensional model in much the same way. One might suggest that the multidimensional model requires

people to reconceptualize SEX but the reconceptualization itself makes use of the same concepts (i.e. MALE and FEMALE) that are fundamental to the understanding that the multidimensional model seeks to replace.

To respond to this objection it is important to emphasize that the reconceptualization I have suggested *revises* the categories 'male' and 'female' but it does not eliminate them, and it does not *intend* to eliminate them; in fact, the concepts MALE and FEMALE are necessary to the multidimensional model itself, and it could not exist without them. It is important to bear in mind that the words *male* and *female* continue to have meaning in a mental scheme that makes use of the multidimensional model of sex: the important difference, however, is that these meanings are different from those that are given to them by the folk understanding. The multidimensional model, actually, could make no more sense of SEX without MALE and FEMALE than the folk understanding could.

It is possible that someone might have an even more complex concern about the names of the continua that underpin the multidimensional model. Someone might reason that if (1) maleness and femaleness constitute the foundation of the multidimensional understanding of sex, and if (2) individual parts are to be represented within the space created by the intersection of Male_C and Female_C, and (3) there is no maleness or femaleness beyond the parts themselves, why are these continua still called *maleness* and *femaleness*? In other words, what makes the groups [XY chromosomes, male external genitalia, testes, and sperm] and [XX chromosomes, female external genitalia, ovaries, and ova] internally coherent? How does being closely located within the some space created by the intersecting continua make these groups of *male* features or of *female* features? How is an XY chromosomal pair *like* a penis, such that they are both accurately categorized as 'male'? And, how is an ovary like vulva, such that they are both accurately categorized as 'female'?

This more complex concern is much more difficult to address. I can, however, suggest one way to address it. This concern can be addressed, I believe, by knowledge about the species whose sexual features are being represented by the model at the time that the concern is raised. To see how this happens, consider again the two particular groups of features just considered. The coherence of these groups stems from two things: 1) their being groups of *human* features, and 2) the fact that in human beings *these groups of features* form a prototypically male grouping or a prototypically female grouping. In other words, an XY chromosomal pair and a penis, and an ovary and a vulva are alike (respectively) in the sense that the features in each pair typically go together in the formation of the prototypical male and prototypical female groupings in the species *Homo sapiens* (respectively). In keeping with the definitions already discussed, which grouping is male and which is female will be determined by which produces sperm and which produce ova, respectively. If it were the sex of individuals of another species under consideration the full groups [XY chromosomes, male external genitalia, testes, and sperm] and [XX chromosomes, female external genitalia, ovaries, and ova] very well might *not* be coherent. The meaning of maleness and femaleness and the coherence of the groups of features identified as belonging to each will likely have to be determined on a species-by-species basis.

6.5.4 Representing changes

In her work *Sexing the Body* Fausto-Sterling (2000) discusses the various ways in which a person's sex can change in the span of a lifetime. She says, "We take for granted that the bodies of a newborn, a twenty-year-old, and an eighty-year-old differ. Yet we persist in a static vision of anatomical sex" (242). Fausto-Sterling explains that such things as "changing patterns of diet

and exercise" as well as "disease, accident, or surgery" can all change a person's sex from what it was at an earlier point in time (242).

One advantage that a multidimensional model of sex has over the folk understanding is that it is able to represent a person's sex as non-static. According to the folk understanding, a person is either male or female, and that is the end of the story. With this understanding, the only change that is possible to represent is *absolute* change: ceasing to be a member of one sex and simultaneously becoming a member of the 'opposite' sex. Although this change is possible to conceptualize using the logic of the folk understanding, it is unlikely that a person who holds this understanding will think that such a change is *actually* possible: the folk understanding has little imagination, and is highly inflexible.

Continuum understandings *could* represent change as well, but the new and old representations would continue to suffer from the same problems as any other representation using a continuum understanding: it either reduces sex to a single representation (as the basic continuum view does), or it artificially divides sexual features in order to represent simultaneous maleness and femaleness (as all continuum views would be forced to do). And it would also continue (as discussed above) to endorse the view that the relationship between MALE and FEMALE is like the relationship between the concepts HOT and COLD, rather than as being like the relationship between the concepts WIDTH and HEIGHT.

The belief in the stability of sex that Fausto-Sterling identifies could be attributed to the also mistaken belief that there is some sex-type that exists beyond or above the sexual components themselves; if one thought that such a thing did exist, then it seems likely one would also think that such a thing could survive change at the component level. But if we no longer assume that

there is a meaning to sex that is beyond the components of sex, we can appreciate that an individual's sex, the components of their sexual system and their relative maleness and femaleness, may go through a series of changes in the time between birth and death.

A few examples will illustrate how these changes could be represented by the multidimensional model of sex. Figure 6-13 represents the sex of an individual who, at the age of 75, has prototypically female external genitalia as well as prototypically female chromosomes. In this example, the person has undergone a complete hysterectomy at some point in the past, and thus gametic and gonadal sex are represented in the lower left quadrant. Also in Figure 6-13 is the representation of the sex of this same individual, but at some earlier point in time. In this representation, all sexual components are present and prototypically female, and are thus represented in the upper left hand corner of the grid.

Fausto-Sterling also mentions change in sex that is undergone by "surgical transsexuals" (p. 242). The multidimensional model could give these occurrences representation: Figure 6-14 suggests a way to represent the sex of an individual who has undergone sex reassignment surgery.

Cases of sex reassignment surgery raise interesting and important questions to do with authenticity, as do the surgical treatments performed on children with intersexual conditions. (The moral implications of the multidimensional model on the latter type will be discussed in detail in Chapter Seven.) Even if the multidimensional model could adequately represent surgical sexual change, which I believe it can, questions of authenticity would likely become a debate. *Should* a surgically fabricated penis be given the same representation as a naturally occurring penis? *Should* more prototypically female genitalia be given a different representation than less prototypically female genitalia, even

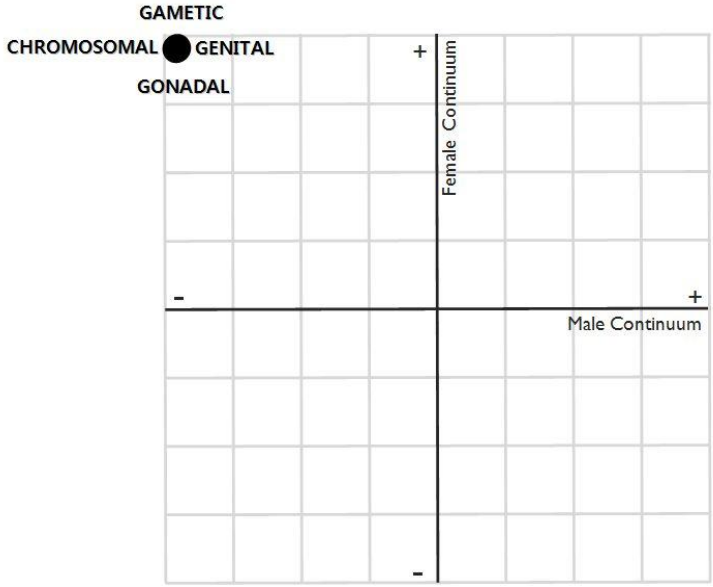
if the former is surgically created and the latter is naturally occurring? Questions such as these are rich and interesting, but are also beyond the scope of this current project. In brief response I can say that the answers to these questions will likely depend upon the connection that one assumes to exist between the natural, spontaneous occurrence of a sexual feature and that feature's prototypicality. Someone whose notions of prototypical maleness and prototypical femaleness involve the presupposition that these naturally occur will not be satisfied with a representation that does not somehow disambiguate naturally occurring and surgically formed features. On the other hand, someone whose understanding of prototypicality does not presume any connection to naturalness would not require such disambiguation between surgically created and naturally occurring features (though they could require it for some *other* reason). This connection would need to be revisited before the multidimensional model could be used in a clinical setting.

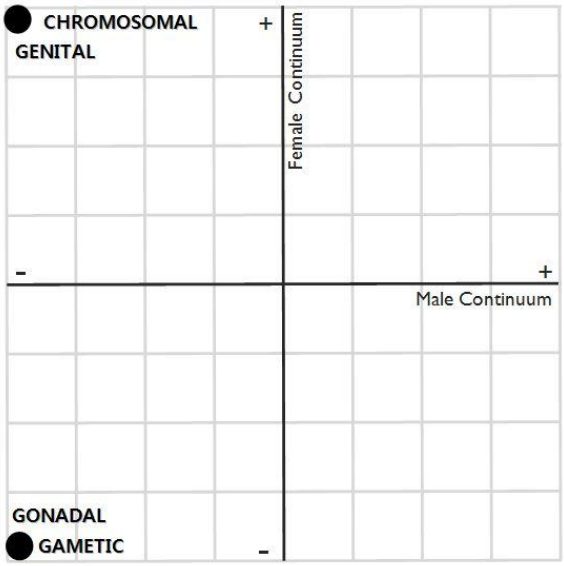
The examples of "disease, accident, and surgery" (Fausto-Sterling, 242) just discussed use different charts to represent different times; it should be noted, in conclusion, that a single chart could be used to represent change over an individual's life. The chart could then become a timeline of sorts, identifying such things as menopause, surgical removal, and transplants.

6.6 Conclusion

Chapter 1 mentioned the fear that some people might have about abandoning the folk understanding of sex and adopting something in its stead. Specifically, people might fear that in giving up the folk understanding and its basic beliefs, they must also give up their understanding of themselves. The multidimensional model can address this fear. Sex is still *something* under the

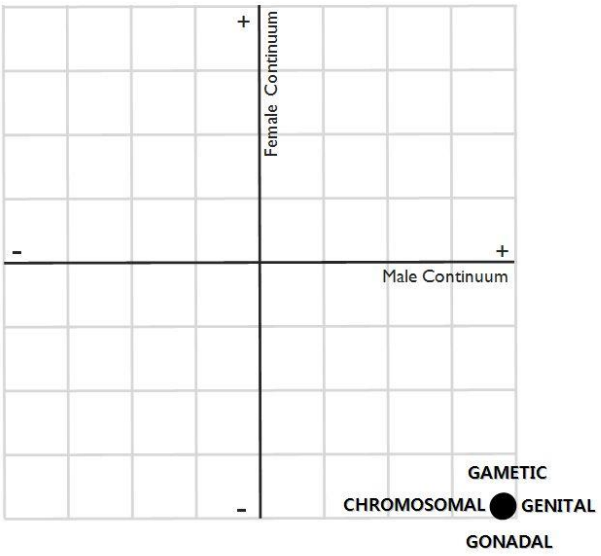
multidimensional model, and it is still something to which the descriptors *male* and *female* apply. It is not, however, a whole-person category. As the next chapter demonstrates, however, there are good reasons to think that life might be better if people were not understood as being females or males, but rather as people who have parts that can be described as male, female, or both.

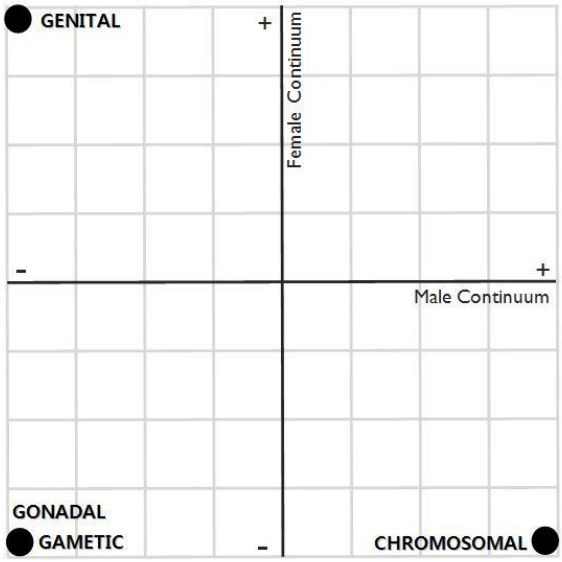




6-13 Example 4 – Individual at younger and older age

Both of these representations relate to a single individual, but at different points in time. In this example 50 years separate the two representations. The upper representation depicts the individual at the age of 25, at which point all components are prototypically female; the lower representation depicts the same individual later in life. Because of a hysterectomy, this individual's gametic and gonadal components are given a different representation.





6-14 Example 5 – Sex Reassignment Surgery

These representations depict the sex of an individual before (upper representation) and after (lower representation) undergoing sex reassignment surgery. This example assumes that surgically created genitals would be represented in the same way as those that naturally occur.

Chapter 7

Moral implications and conclusions

7.1 Introduction

In the first chapter of this dissertation, I acknowledged the propensity people have toward rejecting *any* reconceptualization of sex. One of my responses to this resistance was to highlight that reconceptualizing sex does not mean *rejecting* sex as something that is conceptually important, or as something that exists in the world. Sex undeniably exists; the reconceptualization I have offered simply illustrates that it exists in a different way than what most people think.

I realize that asking people to critically examine their own understanding of SEX is asking more than a little. The concepts MALE and FEMALE are very important, as we use them to make sense of everyday experiences. It is a challenge to think of a person without thinking of that person as male or

female. In addition to this importance, the most common understanding of sex (i.e., the folk understanding) seems obviously accurate; every day of our lives we encounter example after example of apparent evidence in favour of it. Anyone who chooses to critically examine this understanding of sex is undertaking a labour intensive endeavour. So, why do it? Why take on the work associated with reconceptualizing sex? I can suggest two reasons.

First, the work associated with the reconceptualization of sex should be taken on because sex unquestionably exists in the "real world," the world in which people live, love, and have to pay the bills. No matter one's view on the details of the relationship between MALE and FEMALE, I think everyone can agree that in modern Western society (and other societies as well), the combination of (1) one's biological sex and (2) the dominant understanding of sex within one's culture affects numerous aspects of an individual's life.

Secondly, people ought to take on the work of reconceptualization because the concepts MALE and FEMALE are closely tied to ideas about right and wrong: in other words, many common ideas about morality are importantly tied up with ideas about males, females, men, women, girls and boys, and the differences between them.

In this concluding chapter I will identify some of the practices in Western society that exhibit the juncture between sex and morality, and I will suggest the ways in which adoption of the multidimensional conception of sex would affect how these practices would be perceived. I will present the general argument that widespread social acceptance of the fact that maleness and femaleness are qualities that occur at the level of *parts*, not at the level of *people* (a commitment inherent to the multidimensional model), would be likely to produce dramatic changes in the reasoning and actions associated with moral issues related to sex. Moreover, because sex exists in everyone's

everyday life, these changes in thought would likely change how we think about each other, and how we think we ought to live our lives.

7.2 Medical moral issues

Changing one's understanding of sex involves changing one's understanding of diseases and medical processes related to sex. In the examples discussed below I will try to show that changing one's conceptual basis also reveals moral concerns about these diseases and processes.

7.2.1 Intersexuality

Under the folk understanding, a person with an intersex condition is simply illogical, given the meanings this understanding attributes to males and females. Intersexuality is as puzzling as other combinations of contradictory concepts: under the folk understanding, the notion of a *male female,* or *female male* (the first word in each pair being used as an adjective, and the second in each pair being used as a noun) makes about as much sense as the notions of *immoral justice* or *static motion.* As just discussed, the common reaction to intersexuality is to dismiss the importance of the occurrence, not the conceptualization of sex it contradicts. Considering these other contradictory combinations, it is easy to see why people react in this way. Most people encountering instances of these contradictions (i.e., something that is moving in a static way) would likely conclude that there is something not right with either the situation or their perception of it. Very few people, I think, would think that there is something wrong with the concepts involved. Widespread adoption of the multidimensional understanding, on the other hand, would *require* people to reconsider their concepts. As the following discussions will argue, understanding the concepts MALE and FEMALE from the perspective of

the multidimensional understanding would likely lead to substantial change in the medical treatment currently given to individuals with intersex conditions and their families.

7.2.1.1 Should intersex conditions be considered disorders?

In 2006, two professional associations of endocrinologists (the Lawson Wilkins Pediatric Endocrine Society and the European Society for Pediatric Endocrinology) published their "Consensus Statement on Management of Intersex Disorders" (Hughes et. al. 2006). In this publication, the groups suggest using the name "Disorders of Sex Development" in place of older terms including "intersexuality" (554). Table 3 (below) is reproduced from this consensus statement, and summarizes the specific changes it suggests.

The inclusion of the word "consensus" in the title of the document might have been misleading: actually, there were a number of reactions. Within the intersex community there was both guarded acceptance and outright rejection. The Intersex Society of North America (ISNA), some members of which were involved with the development of the new name, officially supported the name change, as well as other aspects of the Consensus Statement. Specifically, ISNA identifies the statement's "[p]rogress in patient-centered care," its "more cautious approach to surgery" and "getting rid of misleading language" as benefits (Intersex Society of North America 2011c). Regarding the third of these benefits, they state, "By getting rid of a nomenclature based on 'hermaphroditism,' our hope is that this shift will help clinicians move away from the almost exclusive focus on gender and genitals to the real medical problems people with DSD face" (Intersex Society of North America 2011c). The Organisation Internationale des Intersexués (OII) responded differently. OII published a "Statement of Dissent," in which they argued against the

"pathological definitions of our bodies and our identities" as well as the suggestion itself that an agreement was ever reached about this issue (Organisation Internationale des Intersexués 2008).

Previous	**Proposed**
Intersex	Disorders of Sex Development (DSD)
Male pseudohermaphrodite Undervirilisation of an XY male Undermasculinisation of an XY male	46, XY DSD
Female pseudohermaphrodite Overvirilisation of an XX female Masculinsation of an XX female	46, XX DSD
True Hermaphrodite	Ovotesticular DSD
XX male or XX sex reversal	46, XX testicular DSD
XY sex reversal	46, XY complete gonadal dysgenesis

Table 3 "Proposed Revised Nomenclature" reproduced from "Consensus Statement on Management of Intersex Disorders" (Hughes et. al., 2006, 155).

There was a range of responses from academics as well. Elizabeth Reis (2007) suggested the name "Divergence of Sex Development" instead of "Disorders of Sex Development." She states that "[u]sing *divergence*, intersex people would not be labeled as being in a physical state absolutely in need of repair" (541). Milton Diamond argued that the word "difference" (2009) or "variation" (Diamond and Beh 2006) be used instead of the word "disorder." Ellen K. Feder and Katrina Karkazis (2008b) argue that the suggestions that "variety" or "divergence" be used instead of the word "disorder" are well-meaning, but also potentially dangerous (35). They write: "The new

nomenclature brings with it the possibility of focusing on genuine medical needs while – *and this must be the ongoing challenge* – understanding different anatomies that are symptomatic of these conditions as mere variations" (35, emphasis added). In another paper Feder and Karkazis (2008a) are still optimistic, but speak of the new name as provisional, rather than permanent. Again they state that the new name can "refocus our attention away from interventions aimed at providing a coherent gender to those that improve health and wellbeing" (2017). They also state, however, that "it is [their] hope that as these [intersex] conditions come to be treated as disorders like many others, the individual diagnoses will be regarded alongside conditions that genuinely share clinical features" (372). Feder (2009) states elsewhere that the new name "may thus promote the transformation of the conceptualization of intersex conditions from 'disorders like no other' to 'disorders like many others'" (136), phrases that Karkazis and Feder also use in their earlier paper, (2008b, 35).

In my writing I have consciously chosen to continue to use the word *intersex* rather than adopt the term *disorders of sex development*. There are two reasons that make me think that popular adoption of the multidimensional model of sex would lead others to do the same.

First, using the name *disorder of sex development* to describe intersexuality seems rooted in the folk understanding, although this has more to do with the way that the word *disorder* works than with the folk understanding itself. To say that something is disordered is to say that its current state is not what it would be if it *were* ordered. Absence of a thing makes sense only when we can imagine the thing being present. It makes little to no sense, for example, to claim that water molecules in a glass or ash particles in a campfire are disordered. These statements would make no sense because we do not have a good idea of what it would mean for them to be ordered. We can make sense

of disorder only in those cases where we can imagine order; we will recognize something as disordered only when we have the expectation that it will be ordered.

In relation to intersexuality, these revelations mean that recognition of disorders of sex development are possible only if what it would be for sex development to be ordered can be imagined, and is expected. If this is the case then I can imagine that most people can have no other "order" in mind than that represented by the folk-concepts of MALE and FEMALE. The folk categories represent the order against which intersex conditions are judged to be *dis*ordered. The folk understanding of sex, therefore, seems to play an important role in the characterization of intersex conditions as "disorders of sex development," even if this is not the intention of those who suggest and support the use of this name. Further evidence for this conclusion is that the term *disorder* seems to be applied only in those cases where maleness and femaleness are somehow mixed; I have not encountered any arguments suggesting that such things as possession of two uteri, two vaginas, two penises, "tubular" breasts, or inverted nipples ought to also be considered symptomatic of "disorders of sex development" although they must presumably be considered examples of disordered sex development if anything is. This leads me to the conclusion that the name "disorders of sex development" is reserved specifically for those conditions that affect sex *in such a way* that maleness and femaleness are mixed (which is, of course, a logical impossibility for the folk understanding).

The second reason I have not adopted the use of the name "disorders of sex development" is because its recommendation comes with expectations about use that are, in all likelihood, too high. Feder and Karkazis (2008b) write "[t]he new nomenclature brings with it the possibility of focusing on genuine medical needs while – *and this must be the ongoing challenge* – understanding

different anatomies that are symptomatic of these conditions as mere variations" (35, emphasis added). The expectation seems to be that people adopt and use the word *disorder* to refer to intersexuality, but resist thinking of the end-state of the disorder (i.e., the individual's sex) as being disordered itself. In a society dominated by the folk understanding, this seems too much to ask. Curiously, even Karkazis (2008) herself seems to express doubt about this possibility in her work *Fixing Sex*; in this work she writes, "[a]lthough some may be able to rethink the meaning of genital variability and the profound entanglements between genitals and gender, most clinicians and parents are either unprepared or unable to do this" (259). In addition to being weighed down by the folk understanding, most people will not be used to using the word *disorder* in the way suggested. For most people a name such as "Disorder of *X*" indicates that in people who have that disorder, *X* is disordered. And to say that *X* is disordered is to say it is not as it ought to be. The strange feature of Feder and Karkazis' argument is that it turns out that the word *disorder* in the name *disorders of sex development* is not the problem: the word *sex* is. For, if the elements of the person's sex are actually just variation (and not disordered states) what unifies these disorders such that they make a coherent group? In a different context, Karkazis (2008) herself writes, "I ask, if one postulates bodies (including genitals, gonads, chromosomes, and hormones), what more does the word *sex* buy us?" (13).

If acceptance of the multidimensional model would lead to rejection of the name "disorder of sex development," as I have just argued, how could or should one refer to such conditions? To answer this question, I turn to a suggestion made by Sharon E. Preves (2003). She writes, "In order to improve the quality of life not just for those labeled intersexed, but for us all, we must remove or reduce the importance of gender categorization and the need for gender categories, including the category of intersex itself" (154).

Preves suggests that instead of focusing on a biomedical condition as an *intersex* condition, the specific elements of that condition that affect the individual's health ought to be of concern to doctors (154). Preves' suggestion is consistent with the multidimensional model. If people were to reduce or eliminate sex categories (which would effectively be done in any case if the multidimensional model were adopted), intersex conditions would be identified by their health-related aspects: the probability that the tissue will become cancerous, or physical difficulties related to urination or menstruation, or issues to do with fertility (if fertility were a concern for the individual). This is to say that intersex conditions would not be identified as conditions related to sex, and so there would be no motivation to speak of them as disorders of it. Intersex conditions would become identified by their relationship to those processes that they disrupt (if they do indeed disrupt anything). Such a radical change in medical focus would lead to changes in medical practice as well, as I discuss in the following two sections.

7.2.1.2 Is informed consent possible?

Right now, most parents who find out their new baby has an intersex condition will interpret the situation from the perspective of the folk understanding. They will have expected a child that is either male or female, and their minds will have difficulty understanding how the child can both combine elements of the incompatible categories, but be neither. These parents can still surely love their child, but the child's sex will be, in many ways, a riddle. Most of these parents (if not all) will turn to health care providers for help. Many of these health care providers (if not all) will also be making sense of the child from the perspective of the folk understanding.

Reflecting on this situation from the perspective of the multidimensional model reveals that aspects of this exchange are morally concerning even if they go unnoticed by those involved. Specifically, the notion of informed consent becomes problematic with the acceptance of the multidimensional model. In *Principles of Biomedical Ethics*, Beauchamp and Childress (2009) identify disclosure as one element of informed consent (120 - 121). Beauchamp and Childress have the following to say about this feature:

> Professionals are generally obligated to disclose a core set of information, including (1) those facts or descriptions that patients or subjects usually consider material in deciding whether to refuse or consent to the proposed intervention or research, (2) information the professional believes to be material, (3) the professional's recommendation, (4) the purpose of seeking consent, and (5) the nature and limits of consent as an act or authorization. (121)

There is disagreement about how elements (1) and (2) ought to be determined; Beauchamp and Childress explain that the doctor could use the "Professional Practice Standard," the "Reasonable Person Standard," or the "Subjective Standard" (123 - 124). Each of these standards suggests a different person that doctors ought to have in mind when they are determining how much information they ought to disclose (i.e., other doctors, rational people, and patients, respectively) (124).

Acceptance of the multidimensional model reveals that the major obstacle created for informed consent in relation to intersex is that the dynamic at work between doctor and patient (or the person making decisions for the patient) does not fit the classic scenario assumed to exist in cases where informed consent is required. In the classic scenario, doctors have expert knowledge and must decide which elements of that knowledge to share with the person who needs to make a decision about medical care. In the classic scenario,

patients could have a range of knowledge about their health and the procedure being considered, but since they are not medical experts like the doctors, their knowledge will always be incomplete. Doctors are morally required to consider their expert knowledge against the patients' incomplete knowledge and determine (by one of the three standards Beauchamp and Childress describe) how much and what information they have the duty to disclose. Acceptance of the multidimensional model reveals that things are unlikely to occur this way in cases of intersexuality, for two important reasons: (1) in all likelihood the doctor does not have all of the knowledge required to provide complete disclosure, and (2) in all likelihood the parents are unaware, and may never become aware, that there is any other relevant non-medical information to be had. Put more succinctly, in almost all situations involving intersexuality neither the doctor nor the patient will be in an epistemic position where informed consent is even possible.

The doctor's epistemic position related to intersexuality will be determined by medical training related to the topic. While medical training might suffice to provide the epistemic position required for adequate disclosure related to things like kidneys or lungs or digestion, it is inadequate to provide the epistemic position necessary for morally complete disclosure about issues related to sex. Biological sex is (as this dissertation demonstrates) a highly debated topic and medicine is *but one* discipline *among many* that purport to possess knowledge about it.

An important difference between medicine and these other disciplines, of course, is that medicine has the power to work directly on the bodies its ideas are about. Doctors and surgeons can change and rearrange tissues in addition to having theories about what those tissues and their arrangement mean. Disciplines such as sociology, history, philosophy, and women's studies do not have this power (and I do not mean to imply that they want it). It must be

noted that the power to directly effect physical change is not an indication of the intellectual rigour of a particular position, nor of its wisdom. It should also be noted that the opportunity for doctors and surgeons to act as experts about sex, and to be placed in a position of epistemic authority over patients and parents, might be a matter of happenstance. It is true that most parents who have a baby that does not fit folk-categories turn to medicine, but it is also true that most patients and parents are already in that environment. When almost all babies are born in hospitals, almost all babies with intersexual conditions are born into the hands of a doctor. Things would likely be very different if these babies were born into the hands of philosophers, or sociologists. *But this would never happen*, someone would likely object, *because philosophers and sociologists do not have the knowledge required to deliver babies.* But why assume that doctors or other medical professionals have the knowledge required to understand and explain all the dimensions of intersexuality, some of which are sociological and some of which are philosophical?

So, the concepts MALE and FEMALE are not under the sole intellectual jurisdiction of medicine, and it is unlikely that the doctor will be able to provide parents with the information they need to make a *truly informed decision* about their child. What further confounds the situation is that the parents are also likely unaware that there exists any salient information beyond the medical information that the doctor provides to them. Unless parents had time to research different conceptualizations of SEX, GENDER, and INTERSEXUALITY, they would likely be unaware that the doctor is unable to provide them with the information that they require to make an informed decision about whether or not to proceed with any medical intervention.

Unless members of the medical community become aware that they are unable to provide the complete disclosure necessary to obtain informed consent, or the parents and patients involved become aware that there are other

interpretations of the medical situations involved and different answers to their questions, things will continue as they are and the ones to protest will be those on the outside of the exchange (such as the sociologists, historians, and philosophers). But if one of these groups, or both, were to become aware that the situation could be improved, morally speaking, what sorts of changes would be suggested by the multidimensional understanding?

Making consent related to intersex *truly* informed would have to involve at least two things. First, the role of medicine would have to be reduced to dealing with the health aspects of the situation (which would *not* include establishing the sexual category the patient falls into). Second, parents would have to be given the opportunity to discuss the issue and their questions with other non-medical experts. Many hospitals now employ clinical ethicists, and parents might benefit from consultation with that person. Whether or not the ethicist would be able to provide the information required for an informed decision would depend upon how much training that person has in the areas of sex and gender. If the ethicist on staff has little to no training in this area, the hospital should have other people (perhaps respected scholars who work on these topics and have a good bedside manner) available to speak with the parents, if the parents so choose.

Arranging for all of this communication would not be easy, and it would certainly take up time and resources, but if true informed consent is to be secured then it must be done. Practically speaking, the hospital staff would also have to ensure that they are putting parents in contact with individuals who are able to appreciate the parents' situation, and respond to it with sensitivity and consideration. Clinicians might want to shelter parents from the further stress and loss of privacy that involving others might cause, but this is not a morally defensible reason for denying them their right to complete information. In fact, clinicians can ensure that parents know their rights by

being transparent about the fact that, if there is no medical concern related to the child's sexual presentation, then there is no need for the parents to involve the clinicians either.

7.2.1.3 Should surgery be performed for intersex conditions?

Even if concerns about informed consent were set aside, acceptance of the multidimensional model would still suggest other reasons to be concerned about the medical treatment of children with intersex conditions. This section will discuss the ways in which acceptance of the multidimensional model would be likely to affect decisions made about surgical interventions on children with intersex conditions.

It must first be recognized that most parents of children with intersex conditions will understand biological sex from the perspective of the folk understanding; because of this, most parents who are faced with decisions about their child's condition will be trying to make sense of both the condition and the treatment from *within* the folk understanding. As mentioned previously, making sense of intersex from within the folk understanding is an impossible challenge simply because of the logic of the folk understanding. The ways that MALE and FEMALE are conceptualized within that understanding do not allow for any comingling of the two; in fact, from the perspective of the folk understanding, an intersex state is as illogical as any other state that violates the law of non-contradiction. Commenting on this sort of shock, Zeiler and Wickstrom (2009) state that when a child with an intersex condition is born "[p]arents suddenly realize that not all children are born as either a girl or a boy. What they previously took for granted, the division of humans into two sexes, i.e., the two-sex model, is shattered" (360). How is surgery

perceived when the birth of a child with an intersexual condition causes this sort of conceptual crisis and disruption?

Zeiler and Wickstrom explain that for many parents of children with intersex conditions "[n]ot letting one's child undergo surgery becomes conceptualized as a way to make the child stand out and not be in line" (369). Understanding a parent's choice in this way implies that surgery is perceived as offering a benefit to the child (i.e., the chance to "be in line" with others whose bodies uphold the beliefs of the folk understanding). Surgery might also offer a benefit for the parents; as Dreger (2006) explains, "medical and surgical intervention is the primary means of demonstrating caring for many clinicians, patients, and family members" (78). If consenting to surgery is thought to offer these children a chance to have their differences erased or minimized and become like their soon-to-be peers, and if it also provides parents with an opportunity to express their affection for their beleaguered child, then it seems clear that, at least with respect to these two motivations, the folk understanding can see such surgery as morally justified.

What I wish to point out here is that acceptance of the multidimensional model would not lead to acceptance of these motivations. Dreger (2006) states "[w]hat you think intersex is determines how you think you're supposed to treat it, and what you think the ethical issues are" (81). If Dreger is right, then acceptance of the multidimensional model would alter the conceptual background against which parents encounter and understand their newborn child, and thereby alter the range of morally acceptable medical treatments for that child. Surgery would be among those medical treatments that would be reconsidered. How would acceptance of the multidimensional model alter one's perception of the moral acceptability of surgery for intersex conditions? I would argue that parents who accept the multidimensional model of sex, when compared to parents who accept the folk understanding, would be less

likely to provide consent for non-medically necessary surgery on their children for reasons related to intersexuality.

One reason I think that parents would be less likely to consent to surgical treatment is because acceptance of the multidimensional model would do away with the dramatic conceptual disruption that can accompany the child's birth, as mentioned earlier. The child would still have a body unlike most other people's, but that body would no longer be an exception to the folk rules of sexual categorization, simply because the old rules would no longer be in effect.

In addition to this benefit, the multidimensional model would offer families the opportunity to see the complexity of different abnormalities, and the ways in which their child's body can simultaneously exhibit both normality and abnormality with regards to sex (which, under the multidimensional understanding would be understood as prototypicality and non-prototypicality, respectively). Rather than the blunt treatment provided by the folk understanding, according to which one is either male, female, or simply unexplainable, the multidimensional model can help to provide a thorough explanation of the ways in which the child's body is like other people's bodies and how it is simultaneously unlike other people's bodies This capacity of the multidimensional model, I believe, would help to relieve some of the initial shock and despair that parents are likely to experience once their child's non-prototypical sex is known.

If the birth of a child with an intersexual condition did not cause conceptual disruption and was not accompanied by intense shock and despair over the child's abnormality, would non-medically necessary surgery be justified for some other reason? On the face of it I cannot see how someone who accepts the multidimensional model could claim that such surgery is justified while

also remaining committed to the basic features of the understanding. All major justification for non-medically necessary surgery seem to be reliant on the folk understanding itself, and specifically its commitments to logical opposition and atomistic structure. But if these beliefs are no longer held, and instead one sees male and female as ways to describe individual parts, and sex itself as composed of a number of features, it is difficult to see what non-medical reason one could have to consent to have their child's sex surgically altered.

7.2.2 Breast cancer

Breast cancer occurs most frequently in people who have exclusively female reproductive parts. It also currently occurs in a society dominated by the folk understanding, which identifies female reproductive parts with femaleness, and femaleness with femininity. It is not surprising then that breast cancer has become a feminized disease, meaning that its representations in society tie it up with gender stereotypes. The quintessential feminine colour, pink, has come to represent the disease and research campaigns associated with it. The Breast Cancer Society of Canada (whose website is overwhelmingly pink) has co-ordinated with a retailer of women's clothes for an annual fundraising activity: a walk through a mall scheduled close to, or on, Mother's Day (Breast Cancer Society of Canada 2011; Mother's Day Walk 2011).

These feminized representations of the disease are misleading, partly because more than just folk-females can and do develop breast cancer. The fact is that *anyone* with a breast (or two) can develop the disease. Some groups have tried to correct the misleading femininization of the disease, but they have done so from within the folk understanding as well. For example, one group has modified the pink ribbon related to breast cancer support by

adding a gradient change to blue (John W. Nick Foundation Inc. 2011), and another by laying a blue ribbon over top of the pink ribbon (Male Breast Cancer Awareness 2011). Blue is, of course, the quintessential masculine colour, and the message is that both men *and* women can develop the disease.

The multidimensional model takes the concepts MALE and FEMALE to apply at the level of parts, not people. Breast cancer is therefore not "a female disease" nor is it "a woman's disease," but not because it is *also* "a male disease" or "a man's disease." There are no sexes to own the disease in this way; there are simply people with breasts, and some of these people will be more likely to develop the disease than others. This is not just a conceptual point, because the way a disease is represented to the public can have moral implications, especially in a society that sanctions deviance from gender stereotypes *and* takes "males" and "females" to be opposite. Men in our society are strongly encouraged to avoid the colour pink; they are also led to believe that in being men they are the opposites of women (speaking generally again). The feminization of breast cancer, then, creates an image of the disease as if it is something that is *not to do with them*, despite the fact that breast cancer can occur in anyone with breast tissue. The feminization of breast cancer that occurs in connection with the folk understanding not only affects the messages that folk-males receive, but it can also affect the care they receive. In April 2010, it was reported that an American man who suspected that he had developed breast cancer (as his father had) was denied services at a breast cancer facility in the state of North Carolina because it "only serves women, aged 40 to 60" (James 2010).

Accepting the multidimensional model would lead to rejecting both the idea that breast cancer is a woman's disease, and the secondary idea that it is more accurate to claim it is *also* a man's disease. Because 'male' and 'female' are not understood to be categories of people from the perspective of the

multidimensional understanding, it provides no reason to speak of a disease (or anything else) as if it were exclusive to, or more likely to develop in, people of one type or the other. From the perspective of the multidimensional understanding, breast cancer would be represented and conceptualized as a disease that develops in breast tissue, and those individuals with more female sexual parts (in both quantity and degree) are more likely to develop it.

7.2.3 Preconception sex selection

If the multidimensional model of sex were accepted the medical procedure called "preconception sex selection" would also be considered morally problematic. What follows is part of the Genetics & IVF Institute's description of the "Scientific Basis" of sex selection by sperm sorting:

> The MicroSort Technology is based on the fact that the X chromosome is substantially larger than the Y chromosome... Since chromosomes are made of DNA, human sperm cells having an X chromosome will contain approximately 2.8% more total DNA than sperm cells having a Y chromosome. This DNA difference can be measured and the X- and Y-bearing sperm cells individually separated using a modified flow cytometer instrument. (Genetics and IVF Institute, 2011)

But since this technology has been created with the folk understanding of sex in mind, obtaining a sperm with (just) an X chromosome or a Y chromosome is to secure more than a haploid cell with a certain feature. From the perspective of the folk understanding, obtaining a sperm with a Y chromosome is to secure a sperm that will produce a male baby who will become a boy who will become a man. Obtaining a sperm with (just) an X chromosome is to secure a sperm that will produce a female baby who will become a girl who will become a woman. X and Y chromosomes, in the folk

understanding, are just indicators of the total package to come. Their predictive value arises from the atomistic nature and the epistemic import that the folk understanding takes biological sex to have. If one knows the sex chromosomes one knows the whole sex, and if one knows the sex one also knows what type of person that person will be.

The multidimensional understanding, of course, has a different interpretation of what this technology is actually capable of doing. The multidimensional understanding takes sexual parts to be interrelated in the sense that they affect each other in important ways, but it also takes them to be independently variable. A person might have all female parts, but some might be more prototypical than others; alternatively, a person might have some combination of male and female parts. From the perspective of the multidimensional understanding, this technology helps to distinguish X chromosome bearing sperm from Y chromosome bearing sperm, but nothing else can be claimed of it with certainty.

It is worth mentioning again that the multidimensional model would not deny common sense. Choosing a sperm with an X chromosome is more likely to result in a child with more female reproductive elements, and choosing a sperm with a Y chromosome is more likely to result in a child with more male reproductive elements. Nevertheless, the multidimensional model highlights that choosing a particular sperm does not guarantee anything about the sex of the person it might produce.

The important moral question, then, is how does the failure to realize that sperm sorting offers no guarantees to do with sex (for reasons beyond the use of a "wrong" sperm), affect the people who use this technology and the babies produced by it? Parents who wish to conceive a child using sperm sorting technology instead of leaving the sex of the baby up to chance very likely have

strong motivating reasons. If parents who use the technology do have such strong motivations, then at least some of them are also likely to have expectations of that child that go beyond sexual features themselves. Is it morally desirable to conceive a child with sex-based expectations in mind? (The parents might not realize that they do have such expectations: what the multidimensional model interprets as expectations, the folk understanding interprets as certainty.) What is most important, morally speaking, is what happens if the child does not meet the parent's sex-based expectations. What reactions might parents have if the child conceived from a Y bearing sperm is not so prototypically male (as could happen, for example, if the individual conceived has some degree of Androgen Insensitivity Syndrome)? What reactions might they have if the child conceived by the Y bearing sperm tends to favour more stereotypically feminine toys and clothes? Because these parents are likely to have strong motivations to use sperm sorting technology, they are also likely to have strong reactions if it fails to produce the type of child they thought they chose.

Someone could argue that *most* parents have the same reactions and expectations of their children, though they are based upon the child's external genitalia rather than chromosomes. I think that such an observation is correct. The belief that sex has epistemic import – that if one knows another's sex, one knows more than *just* that other's sex – is always morally problematic. I think that, at least on a *prima facie* basis, we ought to resist any simplification of the individual to flawed folk-categories that are wrapped up with gender stereotypes. And so I do not think that the general existence of parental expectations related to sex mitigate the moral concerns raised by conceptual shifts about sex and sperm sorting technology; they just reveal that sperm sorting provides a unique occasion for them to be implemented. However, I do think the risk of harm to the child is even greater when a haploid cell is

actively selected from the others because the parents believe it will produce "a boy" or "a girl."

My highlighting of these concerns should not be taken to suggest that I think that sperm sorting is not morally permissible, or that it ought not ever be used. The moral problems I have mentioned have to do with expectations placed on the child conceived by the selected sperm. If the expectations were altered to reflect the fact that the sperm having an X or a Y chromosome guarantees nothing more than that the child will have an X or a Y sex chromosome, then the hesitancy I have expressed would be addressed.

7.3 Non-medical moral issues

7.3.1 Sex segregated social spaces

Outside of the area of medicine, the folk understanding also motivates the creation and maintenance of sex-specific spaces in society. In many cultures throughout the world one can find sex-specific washrooms, change rooms, schools and classrooms, as well as certain living areas such as shelters, camps, prisons, and college and university housing. Since these spaces are created with the folk understanding in mind, they are designated as 'male' or 'female' spaces.

As discussed earlier in this chapter, acceptance of the multidimensional model brings with it rejection of the idea that all human beings can be divided into just two sexual types. This rejection does not necessarily mean that someone who holds the multidimensional view will be opposed to sex-segregated spaces, even if that segregation is based on folk categories. All things being equal, one who accepts the multidimensional model will want to

promote it over the folk understanding. But all things might not be equal: there could be good reasons, morally speaking, to continue to segregate spaces using folk-categories *if* using those categories somehow secures certain moral goods for society. Even though the multidimensional and folk understandings of sex are at odds with one another about most things, they could still agree that the practical effects of one are better, morally speaking, than the other's. To see if dividing spaces by folk-sex categories is something society ought to continue to do even after the multidimensional model is accepted, we first need an understanding of the moral goods it is claimed to promote.

To narrow the scope of this discussion, I will focus here on just one example of sex-segregated space: shared washrooms. With the words *shared washrooms* I simply mean those facilities that are designed to be used by more than one person at a time.

What are the moral justifications? It is difficult to find a well-reasoned argument, or any argument at all, that clarifies the moral justification behind sex-segregated washrooms. But the justification should not be taken for granted, especially once the underlying categories upon which the segregation is based have been reconceptualized. To gain an idea of what the apparently self-evident moral justification is, I looked for Canadian legal cases that involved access to sex-segregated washrooms. The most informative one that I found was the Ontario Human Rights Tribunal case *Seguin vs. Great Blue Heron Charity Casino* (2007) that specifically identifies three moral values related to sex segregated washrooms: privacy, safety, and public decency. In the discussion that follows, I have chosen not to evaluate the claim that sex-segregated washrooms ensure public decency. The notion of "public decency" is itself highly contentious, and I do not wish to enter that debate here. In addition to this, a moral justification is simply inconsistent if it appeals to both privacy and public decency. If it is *not* inconsistent, then it seems there must

be some reasoning that engages the idea that the similarity of external and internal genitalia affect a situation's relative private or public nature. Since most people, I would guess, would favour sex-segregated bathrooms for reasons of privacy rather than for reasons of public decency, I have chosen to address the former.

To evaluate the effect of the multidimensional model on the moral justification of sex-segregated washrooms, the question then becomes whether or not privacy and safety are actually promoted by sex-segregated washrooms *given that* the folk categorization is flawed. To answer this question, the first point to note is that many people do fit nicely into the folk categories, and most people fit well enough to have their differences unacknowledged or unnoticed by others. I will assume for the present that sex segregated washrooms *do* promote safety and privacy for those people who embody or approximate the prototypical male or female forms. Does it do the same for those whose sex is less prototypical? There are individuals whose variation *does not* go unnoticed or unacknowledged, even if they consider themselves unambiguous. There are also individuals who have modified sexual features (either voluntarily or not), and these modifications might take them out of these prototypical categories. There are also those who are born with a sex that combines male and female features. There is good reason to think that for all of these people, sex-segregated shared washrooms are actually likely to violate both privacy and safety.

First, the people whose bodies emphasize the complex and multidimensional nature of sex are overlooked by the simple division between "males" and "females": when they enter a space designated as "male-only" or "female-only," they are entering a space that quite literally was designed without them in mind. Segregated washrooms reify the folk understanding; from the belief that there are *only two sexes* comes *only two spaces*. The concrete reality does

not match up with the flesh and blood reality. If they wish to, or *must* use the sex-specific space, at least two things must take place. They must first make themselves fit the folk categories, meaning that they must identify as one or the other. Following this, the other people already using the washroom must accept them by providing tacit approval. This approval can be given either by not noticing anything at all or by choosing to look the other way (perhaps literally). Failure to receive this acceptance is likely to cause psychological harm, and perhaps physical harm as well, as will be discussed shortly.

So, people who exhibit difference are forced to use spaces that do not acknowledge difference. Is this morally wrong in and of itself? Not necessarily. The practice could still have good effects for the majority of people, and come at little to no cost to the minority. The fact is, though, that there is a cost to those who do not easily fit the folk categories. I would argue that for anyone who has a less than typical appearance with respect to gender, using a sex segregated shared washroom actually poses risks to both safety and privacy. They pose this risk because shared washrooms, despite all the discussion about privacy, are *not* usually very private; they can only ever be as private as a shared space can be (which, obviously, is not likely to be very private at all). Whenever people share a space they gather information about others and make conclusions about them, even without trying. Everyone has experienced this. One needs only to think back to the last time other people were observed, maybe at the doctor's office or a bus stop. Human beings are notorious for drawing conclusions about others from various information, such as the other people's clothes, the subject of their conversations, what they are reading or otherwise doing to pass the time, and who they are with. The same process of information gathering and conclusion-making happens in washrooms. People see each other on the way in, on the way out, and while they are washing their hands; and more than a little can be gleaned about a

person just from being in the adjacent stall (especially if that other person is accompanied by a child who is inquisitive, or talkative, or likes to open the door, or likes to see who is on the other side of the partial wall). Shared washrooms are shared spaces and being in shared spaces always involves a loss of privacy.

For the person whose sexual parts are not prototypically male or prototypically female, this loss of privacy has the potential to be greater than for those who have a prototypical sex, or pass as having it. More of their privacy is at risk because the standards for maleness and femaleness increase in any sex-segregated space. Ambiguity that might be unnoticed, overlooked, or unquestioned in non-segregated spaces will face greater criticism and scrutiny in a sex-segregated space. By the social rules based on the folk understanding, when people enter a sex-segregated shared washroom they are sending the message that they are 1) of one sex and not the other, and are 2) identical to anyone already in the washroom (assuming they have all followed the social rules as well). In addition to being forced to make a self-declaration which then must be validated by others already in the washroom, the individual's privacy could be further compromised by others observing a "mismatch" between what that person does in the washroom and what behaviour is expected of someone of that sex. For example, a person may observe someone enter the women's washroom and thereby identify as a female, and then enter a stall and urinate with feet facing toward the toilet. Or, a person may observe someone enter the men's washroom, and thereby identify as a male, and then enter a stall (perhaps bypassing the available urinals) and urinate with feet facing away from the toilet. In both of these cases, the "passive" observer will learn a lot more about that individual than what could reasonably be expected to be learned from people with more prototypical sex configurations.

Therefore, sex segregated shared washrooms will always pose a greater loss of privacy for those whose sex is non-prototypical, because the segregation is itself based on the assumption of prototypicality. Because of this greater loss of privacy, and because of the public's general tendency to react negatively to ambiguity about sex, sex-segregated shared washrooms have the great potential to become unsafe places for individuals whose sex is not prototypical (or even if their appearance suggests this). To use these spaces, the individual could be subjected to such things as curious looks, insensitive questions, disdainful comments, physical harm, and maybe worse. Valerie Bustros was attacked for using the women's washroom at a club on the York University campus in Toronto; those who attacked her thought "she was using the wrong washroom" (CBC News 2011). Chrissy Lee Polis, a transgender teenager from Maryland, was beaten to the point of seizure for using the women's washroom at a McDonald's restaurant (McCabe 2011). The moral values of privacy and safety, therefore, do not seem secured for all by the practice of sex-segregating washrooms.

I can anticipate a possible objection. Someone might say that individuals whose bodies are exceptions to the folk understanding could minimize the risk to their privacy and safety by choosing to use a non-shared, sex-neutral washroom, or by choosing only to use the washrooms in their homes or other places they assume to be safe. As well as being impractical, these suggestions help to illustrate how sex-segregation based on the folk understanding is oppressive for those who fall outside of the categories. Marilyn Frye (1983a) used the concept of the "double-bind" to help explain how oppression functions:

> One of the most characteristic and ubiquitous features of the world as experienced by oppressed people is the double bind – situations in which options are reduced to a very few

> and all of them expose one to penalty, censure or deprivation. (2)

Frye discusses examples of this phenomenon as women encounter them:

> If one dresses one way, one is subject to the assumption that one is advertising one's sexual availability; if one dresses another way, one appears to "not care about oneself" or to be "unfeminine." If one uses "strong language," one invites categorization as a whore or a slut; if one does not, one invites categorization as a "lady" – one too delicately constituted to cope with robust speech or the realities to which it presumably refers. (4)

The suggestion that non-prototypical people can simply choose *not to use* sex-segregated shared washrooms fits the pattern of the double bind. People can either use the sex-segregated shared washroom and risk safety and privacy, or can deprive themselves the use of such washrooms altogether and accept the presence of a barrier in their public lives that nobody else in society has to experience. The suggestion that certain individuals can choose to avoid certain potentially harmful situations by instead choosing to do something that brings with it is own type of harm does not go a long way in addressing the underlying problems with sex-segregated, shared washrooms.

The previous discussion has argued that sex-segregated shared washrooms pose risks to both privacy and safety for individuals whose sexual parts are not prototypical, and has concluded that the practice is potentially harmful for them. If one is concerned with equality and justice, then these realizations will be enough to show that sex-segregated shared washrooms are morally problematic. But people who are most concerned with other moral values might remain unconvinced; these people might maintain that some degree of harm is acceptable if the practice secures some moral benefit for the majority. So, do sex segregated washrooms really promote and ensure safety and privacy, even for those whose sex is more prototypical than others'?

Christine Overall (2007) addresses many arguments in favour of sex-segregated washrooms, including the appeal to safety and the appeal to privacy. Concerning the former, Overall states, "the concern for safety should be an argument *against* segregation" (82, emphasis in original). Her reasoning is that sex segregated washrooms actually create settings for violence by increasing isolation (82). "Assailants are less likely to act" she says, "in an environment where they can easily be seen and heard" (82).

Overall also rejects concern for privacy as a moral justification for sex segregated washrooms:

> It is not clear that there is anything inevitable or necessary about defining personal privacy by reference to one's genitalia. Nor is there anything inevitable or necessary about the practice of preserving privacy by grouping people on the basis of their putative sameness of genitalia. (80)

I agree with Overall on both of these points, and I think that the multidimensional model can help strengthen them by revealing the illusion that is at work in this sort of reasoning. Treating sexual variation as if it were dichotomous gives the impression that everyone using a certain washroom (assuming no one has broken social rules about using the "wrong" washroom) is identical with respect to sex. This impression, however, is false. Even if nobody ever entered the washroom of the "opposite sex," using the washroom of "your own sex" does not guarantee that everyone else in that washroom will be identical with respect to sex. The complexity of sex in combination with the folk understanding's requirement that everyone identify as one sex or the other means that people who call themselves female will do so for different reasons, as will people who call themselves males. The social rules regarding sex-segregated washrooms require individuals to identify as one sex or the other, and enter the washroom of the sex with which they identify. (Usually this is thought to be the sex that one *is*, and the element of choice – or perhaps

coercion – is itself not even recognized.) The multidimensional model reveals that everyone's adherence to the social rules will ensure nothing more than that all people in a space identify as the same sex: adherence to the social rules does not ensure that everyone has identified themselves that way for the same reason.

Therefore, if sex-segregation is not accomplishing those things it was thought to, then the suffering and hardship of a minority (those who are category outliers under the folk understanding) cannot be overshadowed by the privacy and safety that others are said to appreciate through the practice. To my mind, this means that sex segregated washrooms are morally questionable based on concerns about equality and justice for a minority of people, as well as by concerns about the truth of the moral goods claimed for the majority. But what would be an alternative?

When it comes to sex-segregated washrooms, society apparently has two options: have them, or don't. It seems that society ought to consider the possibility of non-segregated, shared washrooms. As was pointed out earlier, acceptance of the multidimensional model reveals that the creation of two separate spaces does not reflect the biological reality of sex; because of this, what we experience now is already not what most people tend to think it is. Additionally, Overall argued that non-segregated washrooms might actually help to increase safety (82); I think they might also help to increase privacy as well. A non-segregated washroom will tend to be busier than a sex-segregated one, and with an increased number of people there is usually an increase in privacy.

7.3.2 Sex segregated sports competitions

Sexually segregated sports competitions are probably the best known and the least criticized example of sexual segregation in our society. Most people, I would think, do not think twice about the moral justification of creating two pools of competitors based on sex. But what *does* justify this? Why is sex-specific competition a morally good thing?

From the perspective of the folk understanding, males as a type of human being generally have greater strength and athletic skill than females, a distinctly different type of human being. For many people who endorse the folk understanding, I think, limiting competition to individuals of the same sex is thought to help promote fairness: every individual has a fair shot at doing well as each is competing against only those human beings of the same sexual type, and thereby, the same athletic skill level as well. This reasoning of course implies that mixed-sex competitions would be inherently unfair because of the natural tendency for one type to excel over the other in matters related to athletics.

In sports competitions, then, people are divided into two sex-based groups that are thought to encompass all human beings, and this division is done in the interest of ensuring fair competition. The multidimensional model highlights that this division is based on but two possibilities. Acceptance of the multidimensional model would require reconsideration of this reasoning. If human beings are not either male or female (because these describe parts, not people), then what is actually happening when human beings are divided into these two ill-conceived, sex-based groups? The answer to this question will determine whether an appeal to fairness can justify continuing to behave as if the segregation of athletes on this basis could be done.

When people use the folk understanding to divide the whole human population into just two sexual categories, what they are really doing is (1)

choosing to include those individuals whose sexual features all appear at the far ends of the male and female quadrants of the multidimensional model, and (2) overlooking variation by fitting classificatory outliers into one of these two groups. (This particular point will be returned to in discussion of other practices as well.)

Keeping these in mind, the question to be addressed is, does dividing athletes as if there were only two sexual types help to promote fair competition? It appears not to, as this division creates a situation in which people are judged by their sex first (understood as male or female) and their athletic ability second. In similar but separate cases, South African runner Caster Semenya and Indian runner Santhi Soundarajan had to have their sex "verified" to ensure that they really *should* have been competing with females, as they had, and not males (The New York Times 2009; AFP 2007). Canadian cyclist Michelle Dumaresq, a male-to-female transsexual person, had the authenticity of both her sex and her first-place victory questioned by some of her fellow competitors, most notably Danika Schroeter who wore a shirt with the message "100% woman" to accept her second-place award (The Vancouver Sun 2006). At the 2010 Olympic winter games ski jumpers identified as female were not allowed to compete, but ski jumpers identified as male were (The Canadian Press 2009). These athletes' ability to compete, and in some cases their results, were scrutinized on the basis of their sex: a feature that is related to atheltic ability, but irrelevant to the purpose of competition which is to determine who from a pool of competitors has the greatest athletic ability in a particular sport. The maleness and femaleness of a person's sexual features are related to athletic ability, but so are other features such as height and weight. Given the purpose of athletic competition, it seems unfair to preemptively create separate pools of competitors, and perhaps altogether deny some people the opportunity to participate, based on something other

than what the competition is actually interested in measuring and comparing. And from the perspective of the multidimensional understanding, it is even more questionable when this division is based on faulty conceptualizations.

So what would the multidimensional model suggest in relation to competitive sports? The first thing is that whether one's sexual parts can be described as male, female, or both, seems unimportant in the attempt to determine how one's athletic ability measures up against someone else's. The existence of different athletic abilities is what motivates competition. The fact that maleness and femaleness of sexual parts tends to produce differences in athletic ability needs to carry with it no more meaning than the fact that having large lungs and long legs do as well. Certain facts about one's body will affect one's athletic ability; one's sex (i.e., the maleness and femaleness of one's sexual parts) is just one of these.

In competitive sports there can be unfair advantages and there can be unfair *dis*advantages; the natural state of one's body, which includes the maleness and femaleness of one's sexual parts, cannot cause either of these. So dividing by sex artificially divides people prior to comparing athletic ability; once one lets go of the idea that there are just two sexual categories, the rationale behind sex segregation in sports seems to undermine the main purpose of competitive sports (which, of course, is competition).

These conclusions, I admit, are uncomfortable. The automatic response would probably be something like "But without sex segregation females would never get to compete in higher level competitions, and surely that's unfair." Assuredly, it *does* seem unfair, and perhaps unwise, to stop a practice that allows more people to compete. I think this automatic response, however, has its roots deep within the folk understanding.

Someone with the multidimensional understanding in mind would first ask what is meant by the word *female* in the statement of the criticism. If one is thinking from the multidimensional understanding, then the existence of an identifiable, homogeneous group referred to by the word *female* is itself problematic. From the perspective of the multidimensional model, the criticism refers to a non-existent group.

But perhaps this response is semantic fussiness. Using the multidimensional conceptualization, the criticism highlights the fact that, without continued attempts at sex-segregation, those individuals with parts that are more female than male will be less likely to be successful in higher-level athletic competitions with other human beings. It is crucial to notice, however, that this is true of *anyone* with less athletic ability, no matter the cause of it. The multidimensional model takes maleness and femaleness to apply at the level of parts, and so competition is simply between *people*; some of these people have parts that are more male, others have parts that are less male, some have parts that are more female, others have parts that are less female, and some might have both. Unless it is assumed that there is some sort of inherent moral equality between male and female parts, the sexual type of parts that an athlete has is irrelevant to athletic competition.

The deep fear behind this criticism, I think, is that if sports were not sex-segregated males would always be the winners (and females would always be the losers), which seems distinctly unfair. But again, who does one have in mind here? Someone who approaches the issue with the multidimensional understanding in mind would not see things this way. This person would not recognize "males" and "females" as stable, identifiable groups of people in the first place. Someone who holds the multidimensional understanding would only see that winners are those people with greater athletic ability.

In conclusion it must be noted that doing away with attempted sex segregation in sports does not necessarily mean that anyone with less athletic ability (the majority of whom, I agree, may have more female than male sexual components) will not be able to play sports. People can engage in sports for reasons other than competition, including such things as team building, community involvement, recreation, and physical exercise. All of these, like competition, would remain equally open to everyone even if the activities were no longer segregated on the basis of sex.

7.4 Conclusion

This chapter has attempted to show that this conceptual shift can make important differences in the lives of many people, and not just those whose sex is something other than the standard folk-female or folk-male types; the chapter has also attempted to show that these important differences would occur both within and outside of the medical realm.

The second chapter stated that even if concepts are never thought to be more or less accurate than those that come before them, there can still be good reason (i.e., the improvement of human life) to participate in the activity of reconceptualization, and to adopt a reconceptualization that is offered. One could be interested in conceptual efficacy along with (or for some, instead of) conceptual accuracy. This chapter, I hope, has provided strong reasons to think that whether or not the multidimensional model is a more biologically accurate conceptualization of sex, its promotion and adoption would offer significant improvements to the quality of human life.

To be clear, I do think that the multidimensional model of sex is more biologically accurate than the folk understanding, the single continuum model,

the multiple continua model, and even the hybrid model, for all of the reasons already discussed. The multidimensional model can represent the complexity of sex (as the hybrid and multiple continua models do), it can represent the gradation that can exist between male and female forms of sexual features (as all of the continua models do), and it can represent the fact that certain features of sex can be both highly male and highly female (which none of the other models can do). The multidimensional model, in its very structure, recognizes that to represent all of these things the concepts MALE and FEMALE must also be reconceptualized, and the relationship between them must be reassessed. The multidimensional model, in doing all of these things, also offers great improvements over the folk understanding of sex which, from the perspective of the multidimensional understanding, is mistaken about sex in almost all respects.

There are, of course, questions that remain to be answered about the multidimensional model, its implementation, and the practical effects it might have on day-to-day life. The authenticity of maleness and femaleness of sexual features is one topic that remains to be examined. It is quite possible that exploring the topic of authenticity might suggest further refinement of the model, and enrich it thereby. Another remaining question focuses upon the calibration of the dimensions of the model. Would the increments on the continua be small and precise, or larger and more general? To venture a response to this particular question I would suggest that the degree of precision ought to be determined by the intended use of the model. Some clinical uses might require greater precision (for example, if the model is being used to track the effect of hormone therapy on an individual), but for other uses such precision might not be necessary at all (for example, providing a rough location of features would do just fine for people using the model just to gain a general understanding of their sex).

I would like to end this dissertation with statements about what can be concluded, rather than statements about what can be further investigated. And I do think that, at this point, a number of conclusions can be made. A person's sex is not a simple thing: it is made up of individual components that must be given individual attention for the person's sex to be understood completely and accurately. The words *male* and *female* do not identify whole people: they describe individual parts of people's bodies. The concepts MALE and FEMALE are importantly related, but are not logically opposed. And, as I hope this final chapter has shown, reaching these conclusions and allowing them to become active in our day-to-day lives can have great benefits for human happiness and well-being.

References

AFP. 2007. "The Sad Story of Santhi Soundrajan." *The Times of India.* January 9th. Accessed November 11th, 2009. As of June 27th, 2011, this article is no longer available at this location. http://timesofindia.indiatimes.com/The-sad-story-of-Santhi-Soundarajan/articleshow/1109135.cms

Ankel-Simons, Friedrun. 2007. *Primate Anatomy: An Introduction.* Second. Durham, North Carolina: Duke University.

Beauchamp, Tom L., and James F. Childress. 2009. *Principles of Biomedical Ethics.* 6. New York; Oxford: Oxford University Press.

Bem, Sandra Lipsitz, Wendy Martyna, and Carol Watson. 1976. "Sex Typing and Androgyny: Further Explorations of the Expressive Domains." *Journal of Personality and Social Psychology* 34, no. 5: 1016 - 1023.

Bem, Sandra. 1974. "The Measurement of Psychological Androgyny." *Journal of Consulting and Clinical Psychology* 31, no. 4: 634-643.

Blackless, Melanie, Anthony Charuvastra, Amanda Derryck, Anne Fausto-Sterling, Karl Lauzanne, and Ellen Lee. 2000. "How Sexually Dimorphic Are We? Review and Synthesis." *American Journal of Human Biology* 12: 151-166.

Bornstein, Kate. 2003. "The Other Questions." In *Race, Gender, and Sexuality: Philosophical Issues of Identity and Justice*, edited by Jami L. Anderson, 39-45. Upper Saddle River, New Jersey: Prentice-Hall.

Breast Cancer Society of Canada. 2011. "Home." Accessed June 29th, 2011. http://www.bcsc.ca/

"Building Code Act 1992. Ontario Regulation 350/06." 1992. Accessed November 30th, 2011. http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_92b23_e.htm

Burnett, Craig. 2011. "Epsom and St Helier Hospital Trust Faces Fines over Mixed Sex Wards." *Surrey Comet.* November 7th. Accessed November 28th, 2011. http://www.surreycomet.co.uk/news/sutton/9347898.Hospital_trust_faces_fines_over_mixed_sex_wards/

Butler, Judith. (1990) 2006. *Gender Trouble: Feminism and the Subversion of Identity.* New York and London: Routledge.

CBC News. 2007. "Canadians Buying 6-Week Gender Determination Test." *CBC.* May 18th. Accessed December 17th, 2008. http://www.cbc.ca/health/story/2007/05/18/gender-selection.html

—. 2011. "Police Hunt 3 Men for Assault on Woman at York University." April 9th. Accessed June 27th, 2011. http://www.cbc.ca/news/canada/toronto/story/2011/04/09/york-assault.html

Cooper, John M. 1997. Introduction to "Parmenides." In *Plato: Complete Works,* 359 - 360. Indianapolis, Indiana: Hackett Publishing Company, Inc.

Darwin, Charles. (1879) 2004. *The Descent of Man, and Selection in Relation to Sex.* London: Penguin Books.

Darwin, Charles. (1859) 2006. *The Origin of Species.* Mineola, New York: Dover Publications, Inc.

de Beauvoir, Simone. (1953) 1989. *The Second Sex.* Vintage Books Edition, Edited by H.M. Parshley. Translated by H.M. Parshley. New York, New York: Vintage Books.

Diamond, Milton. 2009. "Human Intersexuality: Difference or Disorder?" *Archives of Sexual Behaviour* 38 (2009): 172. doi: 10.1007/s508-008-9438-6

Diamond, Milton, and Hazel G. Beh. 2006. "Variations of Sex Development Instead of Disorders of Sex Development." *Organisation Intersex International.* July 27, 2006. Accessed June 27th, 2011. http://www.intersexualite.org/English_OII/IAIA/Mickey/VSD_not_DSD.html

Dobrovnik, Frank. 2010. "Should Sault Ste Marie hospital rooms be co-ed?" *The Sudbury Star.* Accessed November 28th, 2011. http://www.thesudburystar.com/ArticleDisplay.aspx?e=2485353&archive=true

Dreger, Alice Domurat. 1998. *Hermaphrodites and the Medical Invention of Sex.* Cambridge, Massachusetts and London, England: Harvard University Press.

Dreger, Alice Domurat. 2006. "Intersex and Human Rights: The Long View." 73-86 in *Ethics and Intersex,* edited by S. E. Sytsma. The Netherlands: Springer. http://www.springerlink.com.proxy.lib.uwaterloo.ca/

—. 2004. *One of Us: Conjoined Twins and the Future of Normal.* Cambridge, Massachusetts and London England: Harvard University Press.

Fausto-Sterling, Anne. 1993. "The Five Sexes: Why Male and Female are Not Enough." *The Sciences*, March/April: 20 - 24.

Fausto-Sterling, Anne. 2000. *Sexing the Body.* New York: Basic Books.

Feder, Ellen K, and Katrina Karkazis. 2008a. "Naming the Problem: Disorders and their Meanings." *The Lancet* 372 (December): 2016 - 2017. http://journals2.scholarsportal.info.proxy.lib.uwaterloo.ca/

Feder, Ellen K, and Katrina Karkazis. 2008b. "What's in a Name? The Controversy over Disorders of Sex Development." *Hastings Center Report* 38, no. 5: 33-36. doi: 10.1353/hcr.0.0062

Feder, Ellen K. 2009. "Normalizing Medicine: Between "Intersexuals" and Individuals with "Disorders of Sex Development"." *Health Care Analysis* 17: 134 - 143. doi: 10.1007/s10728-009-0111-6

Friedman, Marilyn. 1996. "The Unholy Alliance of Sex and Gender." *Metaphilosophy* 27, no. 1 & 2 (January/April): 78-91.

Frye, Marilyn. 1983a. "Oppression." in *The Politics of Reality: Essays in Feminist Theory*, by Marilyn Frye, 1-16. Trumansberg, New York: The Crossing Press.

Frye, Marilyn. 1983b. "Sexism." In *The Politics of Reality: Essays in Feminist Theory*, by Marilyn Frye, 17-40. Trumansburg, New York: The Crossing Press.

Gardner, David. 2008. "American Man Claims to be Six Months Pregnant with a Baby Girl." *Mail Online.* March 27. Accessed March 26th, 2009. http://www.dailymail.co.uk/news/article-1001500/American-man-claims-months-pregnant-baby-girl.html

Gegenbaur, Prof. *Grundzuge der Vergleich. Anat.* As cited by Darwin, Charles. (1879) 2004. *The Descent of Man, and Selection in Relation to Sex.* London: Penguin Books.

Gelman, Susan A. 2001. "Essentialism." *The CogNet Library: References Collection.* Edited by Robert A. Wilson and Frank Keil. Accessed June 27th, 2011. http://cognet.mit.edu.proxy.lib.uwaterloo.ca

Gelman, Susan A. 2009. "Learning from Others: Children's Construction of Concepts." *Annual Review of Psychology* 60 (2009): 115 - 140. doi: 10.1146/annurev.psych.59.103006.093659

Gelman, Susan A., and Henry M Wellman. 1991. "Insides and Essences: Early Understandings of the Non-Obvious." *Cognition* 38, no. 3 : 213-244. doi: 10.1016/0010-0277(91)90007-Q

Genetics & IVF Institute. 2011. *MicroSort Technology.* Accessed June 27th, 2011. http://www.microsort.net/

Ghiselin, Michael T. 2006. "Sexual Selction in Hermaphrodites: Where did Our Ideas Come From?" *Integrative and Comparative Biology.* 46, no. 4: 368 - 372. doi: 10.1093/icb/icj039

—. 1969. "The Evolution of Hermaphroditism Among Animals." *The Quarterly Review of Biology* 44, no. 2: 189 - 208. http://www.jstor.org/stable/2819439

Gilbert, Scott F. 2000. "Chromosomal Sex Determination in Drosophila." In *Developmental Biology*, by Scott F. Gilbert. Sunderland, MA: Sinauer Associates, Inc. http://www.ncbi.nlm.nih.gov/books/NBK10025/

Global News. 2011. "Most Shared Stories on Facebook in 2011" November 30th. Accessed November 30th, 2011. http://www.globalnews.ca/world/facebook/6442532551/story.html

Gray, Henry. (1918)2000. *Anatomy of the Human Body.* Edited by Warren H. Lewis. Philadelphia: Lea & Febiger. Online edition, New York: Bartleby.com. Accessed June 27th, 2011. http://www.bartleby.com/107/

Greer, Germaine. 1971. *The Female Eunuch.* London: Paladin.

Grinspun, Doris. 2010. "Re: Hospitals Try Mixed-Gender Rooms, Aug. 31." *Registered Nurses' Association of Ontario.* September 11. Accessed November 28th, 2011. http://www.rnao.org/Page.asp?PageID=122&ContentID=3446&SiteNodeID=490

Hawkesworth, Mary. 1997. "Counfounding Gender." *Signs* 22, no. 3 (Spring 1997): 649 - 685. http://www.jstor.org/pss/3175248

Hendry, Luke. 2011. "Bed crunch means mixed-gender hospital rooms ." *The Intelligencer.* January. Accessed November 28th, 2011. http://www.intelligencer.ca/ArticleDisplay.aspx?e=2935281

Herman, Robert K. 2005. "Introduction to Sex Determination." In *WormBook: The Online Review of C. Elegans Biology*, edited by The C. Elegans Research Community. Pasadena, California. doi/10.1895/wormbook.1.71.1

Hoffman, Jan. 2008. "Vaccinating Boys for Girls' Sake?" *The New York Times*, February 24, 2008, Late Edition - Final ed. Accessed June 27th, 2011. http://www.nytimes.com.proxy.lib.uwaterloo.ca/

Hughes, I. A, C Houk, S. F. Ahmed, P. A. Lee, and LWPES1/ESPE2 Consensus Group. 2006. "Consensus Statement on Management of Intersex Disorders." *Archives of Disease in Childhood* 91, no. 7: 554 - 563. doi: 10.1136/adc.2006.098319

Hull, David. 1965a. "The Effect of Essentialism on Taxonomy - Two Thousand Years of Stasis (Part One)." *British Journal for the Philosophy of Science* 15, no. 60 (February): 314 - 326. doi: 10.1136/adc.2006.098319

—. 1965b. "The Effect of Essentialism on Taxonomy - Two Thousand Years of Stasis (Part Two)." *British Journal for the Philosophy of Science* 16, no. 61 (May): 1-18. doi: 10.1093/bjps/XVI.61.1

—. 2001. *Science and Selection: Essays on Biological Evolution and the Philosophy of Science.* Cambridge: Cambridge University Press.

Hurst, Laurence D. 2003. "Sexes and Mating Types." In *Encyclopedia of Evolution*, edited by Mark Pagel. Oxford University Press. http://www.oxfordreference.com.proxy.lib.uwaterloo.ca/

Intersex Society of North America. 2011a. "What is Intersex?" *Intersex Society of North America.* Accessed June 27th, 2011. http://www.isna.org/faq/what_is_intersex

Intersex Society of North America. 2011b. "Partial Androgen Insensitivity Syndrome." *Intersex Society of North America.* Accessed December 5th, 2011. http://www.isna.org/faq/conditions/pais

—. 2011c. "Dear ISNA Friends and Supporters." *Intersex Society of North America.* Accessed June 27th, 2011. http://www.isna.org/farewell_message

Jacoby, Jeff. 2008. "Jacoby: Pregnant, yes - but not a man - International Herald Tribune." *International Herald Tribune.* April 14. Accessed March 29th, 2009. http://www.boston.com/bostonglobe/editorial_opinion/oped/articles/2008/04/13/pregnant_yes___but_not_a_man/

Jaggar, Alison. 1983. *Feminist Politics and Human Nature.* Lanham, Maryland: Rowman & Littlefield Publisher, Inc., 1983.

James, Susan Donaldson. 2010. "Man Turned Away For Breast Cancer Screening." *ABC News.* April 8th. Accessed June 27th, 2011. http://abcnews.go.com/Health/north-carolina-man-denied-free-screening-suspected-male/story?id=10313188

Jenkins, Anthony. 2011. "Gordie Johnson on Children and Gender Roles." *The Globe and Mail.* October 13th. Accessed November 30th, 2011. http://www.theglobeandmail.com/news/opinions/drawn-off-topic/gordie-johnson-on-children-and-gender-roles/article2200388/

John W. Knick Foundation, Inc. 2011. Home Page. Accessed December 5th, 2011. https://malebreastcancer.org/Home_Page.php

—. 2008. *Fixing Sex.* Durham & London: Duke University Press.

Kay, Barbara. 2011. "A Child's Biology is Not a Matter of Choice." *National Post.* May 21st. Accessed November 28th, 2011.2011. http://fullcomment.nationalpost.com/2011/05/25/barbara-kay-a-childs-biology-is-not-a-matter-of-choice/

Kessler, Suzanne. 1998. *Lessons from the Intersexed.* New Brunswick, New Jersey & London: Rutgers University Press.

Kilmartin, Christopher T. 2000. *The Masculine Self.* Second Edition. Boston: McGraw-Hill Higher Education.

Laqueur, Thomas. 1990. *Making Sex: Body and Gender from the Greeks to Freud.* Cambridge, Massachusetts and London, England: Harvard University Press, 1990.

Male Breast Cancer Awareness. 2011. "Our Male Breast Cancer Ribbon." Accessed June 29th, 2011. http://www.outoftheshadowofpink.com/

Martin, Elizabeth, and Robert Hine. 2008a. "Female." *A Dictionary of Biology.* Oxford University Press, Oxford Reference Online. Accessed June 27th, 2011. http://www.oxfordreference.com.proxy.lib.uwaterloo.ca/

—. "hermaphrodite." 2008b. *A Dictionary of Biology.* Oxford University Press, Oxford Reference Online. Accessed June 27th, 2011. http://www.oxfordreference.com.proxy.lib.uwaterloo.ca/

—. "Male." 2008c. *A Dictionary of Biology.* Oxford University Press, Oxford Reference Online. Accessed June 27th, 2011. www.oxfordreference.com.proxy.lib.uwaterloo.ca/

McCabe, Scott. 2011. "Teen Charged in Transgender Attack Caught on Video." April 25th. *The Examiner.* Accessed June 27th, 2011. http://washingtonexaminer.com/local/crime-punishment/2011/04/teen-charged-transgender-attack-caught-video

McLachlan, John C., and Helen Storey. 2003. "Hot Male: Can Sex in Humans be Modified by Temperature?" *Journal of Theoretical Biology* 222 (2003): 71 - 72. http://www.sciencedirect.com.proxy.lib.uwaterloo.ca/

Medin, Douglas L. 1989. "Concepts and Conceptual Structure." *American Psychologist* 44, no. 12: 1469-1481. doi: 10.1037//0003-066X.44.12.1469

Miracle, Tina S., Andrew W. Miracle, and Roy F. Baumeister. 2003. *Human Sexuality: Meeting Your Basic Needs.* Upper Saddle River, New Jersey: Prentice Hall.

Mother's Day Walk. 2011. *History of the Walk.* 2011. Accessed October 4th, 2011. http://mothersdaywalk.ca/

Murphy, Gregory L. 2002. *The Big Book of Concepts.* Cambridge, Massachusetts and London, England: The MIT Press.

Newton, Paula. 2011. "Boy or Girl? It's a secret - and an international controversy." CNN. May 27th. Accessed November 28th, 2011. http://www.cnn.com/2011/WORLD/americas/05/27/canada.gender.storm/?hpt=T2

Nicholson, Linda. 1998. "Gender." 289 - 297 in *A Companion to Feminist Philosophy*, edited by Alison M Jagger and Iris Marion Young, 289-297. Malden, Massachusetts: Blackwell Publishers.

Oprah.com. 2008. *First TV Interview: The Pregnant Man.* March 28. Accessed March 5th, 2011. http://www.oprah.com/community/thread/44940. As of December 5th, 2011 this page is no longer available.

—. 2006. *Unprecedented Pregnancy.* January 1st. Accessed December 5th, 2011. http://www.oprah.com/relationships/Unprecedented-Pregnancy/1

Organisation International des Intersexués. 2011. *F-PositionsOfficielles.* Accessed September 26th, 2009. http://www.intersexualite.org/English-Offical-Position.html

—. 2008 "OII's Statement of Dissent." 2011. Accessed June 27th, 2011. http://www.intersexualite.org/Dissent.html

Overall, Christine. 2003. "A Plea for Sex." Unpublished Essay. Included in readings assembled for the course PHIL 402/673 "Modern Feminism," taught by Dr. Christine Overall at the University of Waterloo, in Waterloo, Ontario, Canada, 2003.

Overall, Christine. 2007. "Public Toilets: Sex Segregation Revisited." *Ethics and the Environment* 12, no. 2: 71 - 91. http://muse.jhu.edu.proxy.lib.uwaterloo.ca/

Plato. 1997. "Parmenides." In *Plato: Complete Works,* edited by John M. Cooper, translated by Mary Louise Gill and Paul Ryan, 359 - 397. Indianapolis, Indiana: Hackett Publishing Company, Inc.

Poisson, Jayme. 2011. "Parents keep child's gender secret." *The Star.* May 21st. Accessed November 29th, 2011. http://www.thestar.com/article/995112

Preves, Sharon E. 2003. *Intersex and Identity: The Contested Self.* New Brunswick, New Jersey & London: Rutgers University Press.

Reis, Elisabeth. 2007. "Divergence or Disorder? The Politics of Naming Intersex." *Perspectives in Biology and Medicine* 50, no. 4 (Autumn 2007): 535-543. doi: 10.1353/pbm.2007.0054

Rorty, Richard. (1994) 1999. "A World Without Substances or Essences." In *Philosophy and Social Hope,* 47-71. London, England: Penguin Books.

Sax, Leonard. 2002. "How Common is Intersex? A Reply to Anne Fausto-Sterling." *The Journal of Sex Research* 39, no. 3: 174-178.

"Seguin vs. Great Blue Heron Charity Casino 2007 HRTO 33 (CanLII)." *CanLII.* October 15, 2007. Accessed June 27th, 2011. http://www.canlii.org/

Sommerville, Margaret. 2011. "Storm over baby's gender." *MercatorNet.* May 31st. Accessed November 30th, 2011. http://www.mercatornet.com/articles/view/storm_over_babys_gender

Spence, Janet T, Robert Helmreich, and Joy Stapp. 1975. "Ratings of Self and Peers on Sex Role Attributes and Relation to Self-Esteem and Conceptions of Masculinity and Femininity." *Journal of Personality and Social Psychology* 32, no. 1: 29 - 39.

Stein, Edward. 2001. *The Mismeasure of Desire.* Oxford: Oxford University Press. http://books.google.com

Stoltenberg, John. 1989. *Refusing to be a Man: Essays on Sex and Justice.* Penguin Books.

The Canadian Press. 2009. "Supreme Court Spurns Female Ski Jumpers." *cbc.ca.* December 22. Accessed June 27th, 2011. http://www.cbc.ca/olympics/skijumping/story/2009/12/22/bc-oly-women-scoc.html

The New York Times. 2009. "Times Topics: Caster Semenya." *The New York Times.* August 26th. Accessed June 27th, 2011. http://topics.nytimes.com/top/reference/timestopics/people/s/caster_semenya/index.html?scp=1-spot&sq=caster%20semenya&st=cse

The Vancouver Sun. 2006. "Banned for Mocking Transgendered Winner." *Canada.com.* August 3rd. Accessed June 27th, 2011. http://www.canada.com/vancouversun/news/story.html?id=b49de62b-e7dc-4699-83ab-ada11000f500

Trebilcot, Joyce. 1982. "Two Forms of Androgynism." In *"Femininity." "Masculinity," and "Androgyny"*, edited by Mary Vetterling-Braggin, 161-169. Totowa, New Jersey: Littlefield, Adams & Company.

U.S. National Library of Medicine. 2008. "Androgen Insensitivity Syndrome." *Genetics Home Reference*. Reviewed May 2008. Accessed June 27th, 2011. http://ghr.nlm.nih.gov/condition=androgeninsensitivitysyndrome

Wallace, Kenyon. 2011. "How Star Story about Genderless baby went viral." *thestar.com.* May 27th. Accessed November 30th, 2011.

http://www.thestar.com/news/canada/article/998711--how-star-story-about-genderless-baby-went-viral

Warren, Mary Anne. 1982. "Is Androgyny the Answer to Sexual Stereotyping?" In *'Femininity,' 'Masculinity,' and 'Androgyny'*, edited by Mary Vetterling-Braggin, 170 - 186. Totowa, New Jersey: Littlefield, Adams & Company.

Woodhill, Brenda Mae, and Curtis A. Samuels. 2004. "Desirable and Undesirable Androgyny: A Precription for the Twenty-First Century." *Journal of Gender Studies* 13, no. 1 (March): 15 - 28.

Zarkower, David. 2006. "Somatic Sex Determination." In *The WormBook: The Online Review of C. Elegans Biology*, edited by The C. Elegans Research Community. doi/10.1895/wormbook.1.84.1

Zeiler, Kristin, and Anette Wickstrom. 2009. "Why do 'we' perform surgery on newborn intersexed children? The Phenomenology of the parental experience of having a child with intersex anatomies." *Feminist Theory* 10, no. 3: 359 - 377. doi: 10.1177/1464700109343258