

The Gender Continuum: Implications For Theory and Practice

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I would like you to imagine the following scenarios and consider how each of you would react if they had happened to you.

- You are an 18 year old athlete who has just had a resounding victory in the 800 m at a large international meet. However because your victory was so great and you were more muscular and had a deeper voice than your competitors there were claims that you were a man even though you had been brought up as a girl since birth. You were forced to go for “gender testing” and were generally publicly humiliated. When the tests came back you were found to have undescended testes in the lower abdomen and no ovaries or uterus, even though your external genitalia were phenotypically female. (Caster Semenya, at the World Track and Field Games in Berlin, August 2009)
- You are a 23 y old female athlete who is participating in your first international track meet as a representative of your country. As part of the doping and other controls you supply both urine and cheek swab samples and don't think anything of it because you know that you are totally clean; not even caffeine from coffee or tea. However, about two hours before your race you are called into the team manager's office and told that you will not be able to participate in your upcoming races or even worse, never be able to race again - the tests showed that in spite of what you have believed and your body has been demonstrating for the last 23 y, you are not a female but a genetic male. The fact that you have all the attributes of a female are irrelevant, it does not matter what your birth certificate says, the tests show that you have an XY genetic make-up. (Maria Patino of Spain, World University Games, Kobe, Japan, 1985. She subsequently fought and won an exemption for participation in the Barcelona Olympics being given a certificate of femaleness, but gender testing was still carried out throughout both the Barcelona and Atlanta Olympics. This leads to a further question - "Is this still another way of intimidating female athletes?")
- You have been a famous female athlete winning numerous medals. Some time after retirement you are accidentally killed during a robbery. An autopsy reveals that although you have lived all your life as a female you were found to have had ambiguous genitalia. In death you are now vilified and attempts were made to take away your Olympic medals (Stanislawa Walasiewicz who competed for Poland in the 1932 and 1936 Olympics. After immigrating to the States she became Stella Walsh, a naturalized citizen who was killed in 1980 during a robbery in Cleveland. This also raises profound questions about "right to privacy" and media ethics.)
- You are born an apparently hale and hearty baby girl and live a happy childhood within the customs of your culture. As is normally the case you are betrothed by your father at an early age and are "married" before puberty. However a most terrible change occurred during what should have been a normal puberty as you found yourself masculinizing with a deeper voice, body and facial hair and your apparent clitoris developed into a penis. You were ridiculed for being different and frequently ostracized by the community as punishment for the embarrassment you have brought to your family. (New Guinea & Guatemala)

Webster's College Dictionary (1991) New York: Random House

- Sex *n.*
1. either the male or female divisions of a species, especially as differentiated with reference to the reproductive functions.
 2. The sum of the structural and functional differences by which the male and female are distinguished, or the phenomena or behaviour dependent on these differences
- Gender *n.*
2. Sex.

The New Shorter Oxford English Dictionary (1993) Oxford: Clarendon

- Sex *n.*
1. either of the two main divisions (male and female) into which many organisms are placed on the basis of their reproductive functions or capacities.
 4. The difference between male and female, especially in humans. Now, specifically, the sum of the physiological and behavioural characteristics distinguishing members of either sex; (manifestations or consequences of) sexual instincts, desires etc.
- Gender *n.*
3. The state of being male, female or neuter; sex; the members of one or other sex.

It is interesting to see how these definitions have changed from 1971 at which time gender is clearly dichotomized to 1993 where it is now clearly blurred. But in reality what do these definitions mean, in terms of daily living, academia and the school community? What do we mean by the terms male and female? I am an XY female with atrophied internal male organs and no internal female organs. I could well have been an XXY, an XO or an XXX female for example. If I happened to be genetically XX, our so-called normal woman, I could have one, two or no uterus or have a variety of other conditions that prevent me from fulfilling my prescribed societal role of motherhood. I would like at this time to emphasize that I am not talking about homosexuality, an entirely different condition around sexual orientation, and that has absolutely no connection with gender per se.

Jan Morris, in her biography "Conundrum", talks about different dimensions of sex/gender around such themes as chromosomal sex, hormonal sex and psychological sex (p. 104), to which I would add that none of these are rigidly defined, we are all entanglements of different continuums.

There are many conditions that place people on a continuum outside the conventional dichotomized labels of male and female. For some of these there are precisely defined genetic links such as mistakes in the rearrangement of whole chromosomes during gamete formation, whereas others are associated with point errors in one or more individual genes that affect the operation of the multiple enzymes or receptors that enable the processes necessary for "normal" development to be carried out. Still others may be due to interference from external sources on fetal development - recent cross discipline research suggests that long-lived breakdown products of formerly common pesticides such as DDT, DDE and PCB's can act as either hormone mimics or hormone blockers in the nervous system of a developing fetus, particularly during the first 12 weeks of pregnancy. Some of the more common of these will be described, followed by some of the less clearly identified conditions.

Whole Chromosome Disorders

Many science texts up to the lower post secondary levels explain gender as being absolutely due to the presence or absence of an X or Y chromosome, with normal females being XX and males being XY. In some cases there are abnormalities in the karyotypes, but in many others the conditions result from other associated enzymes and hormones not working properly. The following variations may be discussed briefly in terms of the basic biology, but such an approach does not begin to get into the question of "How do such people feel about their sense of self in terms of the cultural layers through which they move during their lived experiences?"

Turner's Syndrome - XO (1 in 3500 females)

External genitalia female. Generally short stature, wide chest with undeveloped breasts and thickened neck. Normal verbal IQ and tendency to lower than average performance IQ scores. Reproductively sterile as the internal organs have not fully developed. Lower than normal estrogens and androgens.

Klinefelter's Syndrome - XXY (1 in 5-600 males)

External genitalia male but testes typically smaller than average. Body structure tall and slim, with sparse body hair (female pattern) and gynecomastia (some female pattern breast enlargement that in extreme cases requires mastectomy). Tendency to lower than average verbal IQ and performance IQ scores. Reproductively sterile as testes deformed.

XYY (1 in 2000 males estimated)

External genitalia of normal male. Body structure is tall and slim, with normal male secondary characteristics. Tendency to normal to low verbal and performance IQ scores but data highly variable. Reproductively normal. Many attempts have been made in the past to connect the extra Y chromosome to increased testosterone and therefore increased aggression. The number of Y chromosomes has no impact on the amount of blood testosterone

Trisomy X - XXX (1 in 1400 females)

Little reliable data, but certainly is not a super-female. She has normal IQ's and normal reproductive ability. Just as the XYY is assumed to have extra testosterone, many texts propose that such women have extra estrogen, but no such effect occurs (see XYY).

Specific Chromosome DefectsAndrogen Sensitivity Syndrome (AIS)

Affected individuals have an XY genotype but normal female external phenotype. Internally there are no ovaries or uterus and the vagina is sometimes shortened and blind, but male internal organs, including testes, are present in the lower abdomen. The testes are releasing testosterone but the receiving receptor for testosterone and hydrotestosterone is not working properly and so male development is arrested. Women with this syndrome are frequently taller than average and can live a functioning life except that they have to adopt children. She may need some additional hormone treatment at puberty to facilitate the maturation of her breasts. This is the example of the athlete in whom the condition is frequently not diagnosed until later on in life due to the tendency of rigorous exercise to retard some of the changes normally expected at puberty. (Maria Patina, Caster Semenya)

[A twist in Canadian law - if the woman wants to have the testes removed it is considered to be a legal sex change.]

5 - Alpha Reductase Syndrome

In this pseudohermaphroditic condition the enzyme 5 - alpha reductase (on chromosome #5) is missing in a genetic male (XY) fetus, and hydrotestosterone cannot be processed at all. This results in distorted external genitalia giving the appearance of a possible female at birth. Internally testes are located in the lower abdomen and the rest of the male organs continue to develop under the action of testosterone. At puberty, under the influence of extra testosterone, the apparently external female organs begin to masculinize and the person's phenotype follows their genotype. One needs to keep in mind that the penis and clitoris and the scrotum and external labia are analogues. In some cultures this gender change comes at a cost of tremendous social conflict, whereas in others the society is used to it and the afflicted individuals adapt relatively easily to their new role.

Adrenogenital Syndrome (AGS)

Individuals with this condition are missing the enzyme that converts 17-hydroxy-progesterone (17-HPG) and so it cannot be converted into cortisone. Rather than continuing to build up in the body, the excess 17-HPG is then converted into androgens. This happens after the differentiation of the internal female organs but before the development of the external genitalia that become masculinized as a result of the excess androgens to produce an enlarged clitoris and labia fused to give the appearance of a scrotum. Surgery will convert the external genitalia to match the female genotype. (Stella Walsh)

Congenital Adrenal Hyperplasia (CAH)

Each gender produces both estrogens and androgens and it is the relative quantities of each at the appropriate times during fetal and later development that determines the final appearance of the individual. There are many, but not as drastic conditions that change the balance of these hormones usually affecting the secondary characteristics. We have for example examples of excess musculature or excess body hair in some women under the influence of excess androgens (CAH). In some cases medication can reduce the severity of the condition and make life more livable for the individual. Furthermore as we age we tend to move closer towards each other from a gender perspective.

Multifaceted Conditions

Although we are frequently taught that gender is all in the X and Y it is quite clear as we have seen from some of the above discussion that genes on other chromosomes are also heavily involved in manufacturing the various enzymes that are necessary for the proper processing of the primary hormones. If any of these enzymes are not being properly produced or are not functioning as expected the various variations of the body away from the expected norm would push people along the continuum.

How many people are affected by the multiplicity of gender conditions? In terms of the major conditions, Sandra Harding (The Science Question in Feminism, p.127) suggests that 2-3% of the population might be born as some form of pseudohermaphrodite, but the medical profession is quite secretive about the number of gender clarification operations carried out each year in newborns. In terms of Harding's use of pseudo-hermaphrodite, it has generally no longer used, the term intersex being preferred. However I would posit that if we consider all the possible conditions that place people along the continuum, in fact the 2-3% estimate is significantly low.

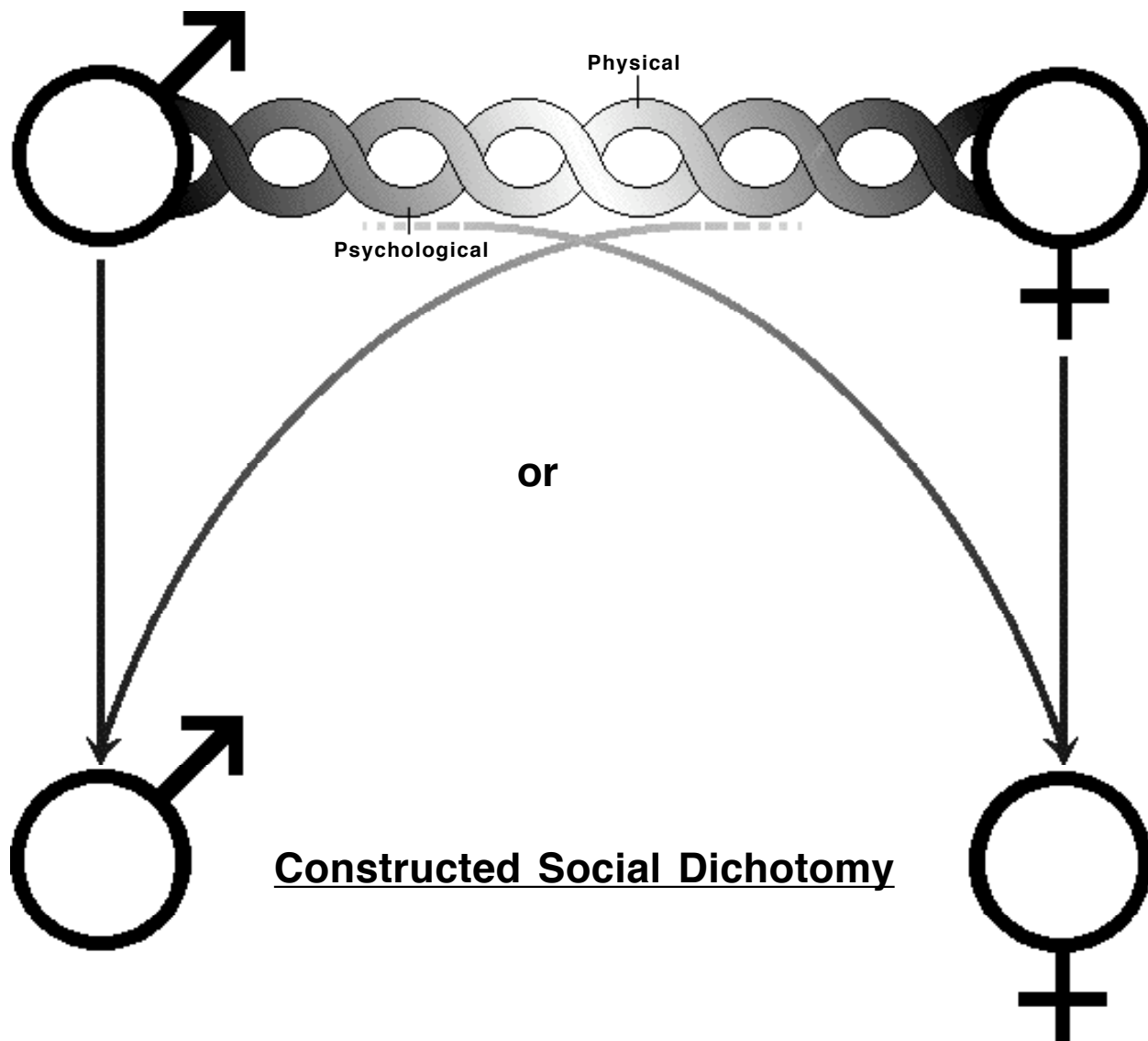
It is becoming more and more obvious that we are becoming more open about the realization that some of us are not born perfect and that it is nothing to be ashamed of if the discrepancy is gender related rather than physically related. At the same time the slow breakdown of reductionist biological models and the expansion of causal relationships is making scientists, doctors etc. much more aware that the body is infinitely more complex than we had initially believed. There may not be answers to all conditions but respect for the individual will give us a better chance of finding out more answers. Individuals need to be assessed and treated on an individual basis, not according to assumptions based on a larger group. The literature on the development of gender identity at times is quite confusing. Certainly babies as young as 6 months can differentiate between male and female roles but they have no concept of how that relates to them. Children around three years of age associate gender with clothed appearance and conceptually do not appear to relate genitalia to biological sex. Some people who are raised in a gender role different from their biological sex can adjust easily to a new gender role, as in my case, whereas others have a great deal of difficulty - it is misleading for the medical profession to make blanket generalizations.

This mechanization of the body, starting at around the times of Descartes, and Newton reinforced the idea in Western Society that the body was a machine that could be perfectly described in terms of its parts, much like a piece of mechanistic technology. Men and woman had to be different, they had some different parts and therefore over the last three hundred years we have seen the rigid dichotomizing taking place with the associated prescriptions of gender roles. In the 18th century the Marquis Chevalier d'Eon decided that, as he felt more female than male he was going to live as a woman. There was not a great social

upheaval that would have been instigated in later years. In a number of cultures, Hawaii, First Nations, Indian, people who were in between or felt that they were in between were highly regarded as spiritual leaders. Mind you, in the Middle Ages I would have probably been burned as a witch.

The following diagram reflects the thesis that gender is on a continuum on at least two dimensions; the physical and the psychological. I have represented this conflict between biology as a continuum and role as a highly structured dichotomy, and the conundrum in which people in the middle find themselves.

Multiple Biological Continuums



In terms of my own perceptions of gender it is quite clear that I was pushing the bounds of normality as a male. Certainly the testes were functioning properly and I was able to father children, but it is becoming more and more clear that the other roles of the androgens in controlling various body processes has not been working properly. It is not reasonable to have started significant bone loss by my late 20's,

particularly when one acknowledges my healthy lifestyle, or that by the mid-40's my prostate had shrunk to a negligible size, both conditions strongly suggestive that testosterone has not been properly processed in my body for many years. Add to that my structural feminization at puberty and we clearly have a complex of events that cannot be conveniently classified. It was an effort to live as a male as a slight change of clothes or hair length would bring out the suggestion that I was in fact female, or else be a source of puzzlement until I had made a clarification.

There are further questions about how identity is determined and reinforced. How is it that some people who are technically at one end of the continuum covertly become more familiar with the other role, in spite of all of society's conditioning to keep them in their initial role? How do people who have medically shifted along the gender continuum, to the point sometimes of taking on a complete reversal of roles, take on and learn about their new role? How do they adjust to new expectations around gain or loss of perceived privilege?

In the Cree nation I would be described as having "Two Souls" and would be a highly regarded spiritual elder, yet only a few years ago I would have been treated as a freak and thrown out of my profession. As it is I feel that I have been very privileged in my life to be able to move along the continuum and that the description of Two Souls is very apt. Certainly I have had my difficult times, but over all I am very happy with the way my life is turning out.

So this brings me to the second part of my title - Implications for theory and practice. Although I will admit that I have not spent my life researching gender issues, it has become very apparent from some of the recent feminist writers and research who are challenging conventional assumptions, that the boundaries between biological gender are extremely blurred (Sandra Harding, Donna Haraway, Patti Lather, Anne Fausto-Sterling). Certainly much academic journal writing, under the influence of the sociobiologists, still seems to be locked into views of gender that have been dichotomized into the formalized western biological construct of gender as being either male or female and it is within this paradigm that much of the research has been focussed. If the gender boundaries are much closer, even blurred or overlapping, than previously considered, how do we get away from this dichotomy and its tendency to reinforce traditional social behaviours?

One way out of this dilemma is to stop focussing on biology, as we know that this is not a clear-cut dichotomy, and focus on gender role that tends to be much more so in all cultures. For example although I am genetically XY I am clearly identified as living in a specific female role and I am expected to conform to certain behaviours that society has deemed to be acceptable for that role. However I do seem to spend much of the time fighting those unwritten, but clearly proscribed, behaviours. Using this definition, research can move away from the problematic linking of math skills, verbal skills or spatial skills for example, away from the sociobiological approach, towards investigating direct and indirect social influences on the construction of a gender role and the embedding of the behaviours expected in a society of what it means to live within that role. Again returning to the feminist literature, the identification of particular traits associated with a so-called specific biology is highly problematic, and only tends to reinforce the traditional dichotomies and cultural roles, frequently within an overriding dominant paternalistic society.

I happen to believe that in my role as an educator that I should be an activist, not maintaining the status quo, but fighting for the dignity of all, but I realize that not all educators or academics share this vision. Perhaps they are so deeply indoctrinated or so relatively privileged that they cannot or do not want to challenge their overriding assumptions. If we move away from a sociobiological focus to a social construct focus we can perhaps get a better handle on the social causes behind differing behaviours, and perhaps we are then in a much stronger role at influencing social change. This can also have impacts on the fundamental role of the academic community in that I believe that not only should academic work be

recognized, but an even more important focus should be on getting good research findings out into the greater community to push for change. Having worked as a high school science educator for almost forty years I have come to realize how unaware the average school based educator, whatever their role, is of some of the exciting work coming out about how people learn, the strength of unformulated learning, situated cognition, non-disciplinary teaching, the challenges to currently practiced assessment procedures, and the nature of educational change for example.

Within the grade school education system we have to work much harder at breaking down false expectations around gender in all facets of our work - classroom practices, type of assignments, assessment goals, resources. I am continually amazed at the poor quality of science texts for the high school level. Not only do they contain numerous errors, but are frequently dated, based on the mythical behaviour called the "scientific method", tend to give no sense of how science, or other, knowledge is constructed, and in general are so full of irrelevant trivial facts that they are not the sort of book, unless you are completely nuts, that one would pick up and read with interest. However since fundamental change cannot be imposed and must come from the teachers themselves, what does this imply for the training of new teachers but even greater, the re-training of teachers currently in the system. We cannot do one without the other - if in a high school of say 50 teachers, two or three are replaced by teachers new to the profession, how much change will those two or three be in a position to effect. None! They will be very quickly browbeaten and subsumed into the system, unless they are extremely strong mentally, and then they put up with the hassle of their peers and administrators. Change will not occur unless we challenge the assumptions and beliefs of the currently practicing teachers, and I am just talking here about conventional school classrooms. The greater changes that some people suggest that are needed around time, space and power that dominate the running of schools are much bigger issues (Fullan).

So how do we make change to: -

- fundamental assumptions around pre-service teacher's beliefs and practices.
- fundamental assumptions around current teacher's beliefs and practices.
- how we can improve communication at two levels - one to the practicing teachers and two the general public and politicians.
- the resources that are commonly found in schools.
- assessment practices that better reflect a much greater range of an individual's learning.
- the formalization of this mythical entity of biological gender - why do class lists designate the number of males and females. Is it biology or role that we are categorizing, and what about the biological in-betweens forced to conform to one or other dichotomy in terms of their role.

None of these are easy issues, but I believe that we have to start working on those problems and start soon. The longer we delay the greater the challenge will be. Neither Universities nor state schools can continue to function in a world of isolation or in a world on maintaining the status quo.

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