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An Ethical Analysis of the Treatment of Olympic Athletes with Sex-Linked Chromosomal Abnormalities

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An Ethical Analysis of the Treatment of Olympic Athletes with Sex-Linked Chromosomal Abnormalities

A Senior Honors Thesis

Submitted in Partial Fulfillment of the Requirements for Graduation in the Honors College

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# Table of Contents

- Biology .................................................. Page 3
- History of Gender Verification ....................... Page 6
- Maria Patino ............................................. Page 10
- Dutee Chand ............................................. Page 14
- Caster Semenya ......................................... Page 19
- Ethical Analysis .......................................... Page 21
- Bibliography ............................................. Page 29
Biology

From a scientific standpoint all humans are the same. All humans are made up of genes, and all human genes are 99.9% similar to every other human on earth. That .1% represents all the genetic variability that exists across the globe. However, instead of celebrating our similarities, the human population has often chosen to pick out the tiny genetic changes that separate us and alienate those who are different.

A person's genotype is the culmination of all the genetic factors that make them who they are. In the body the gene is the basic physical and functional unit of heredity, in which parents pass down their traits to their offspring's. Genes are made up of Deoxyribonucleic Acid (DNA). DNA codes for proteins and gives instructions for the how body should run and look. In the nucleus of each cell, the DNA molecule is packaged into thread-like structures called chromosomes and carry genetic information in the form of genes. Each chromosome is made up of DNA tightly coiled many times around proteins and arranged in pairs.

2 ibid
Every person on earth has received a full set of 46 chromosomes. The mother donates 23 sets in the egg, and the father donates 23 sets in the sperm. When the egg and sperm meet, and fertilization occurs then the developing fetus now has a full set of chromosomes. From this original cell, the DNA has to replicate to fill every cell in the body through the process of meiosis. In meiosis, the maternal and paternal chromosomes can be replicated into the daughter cells in many different combinations. In humans alone, there are $2^{23}$ possible combinations that exist in the .1% difference in genes. This process of crossing over ensures genetic variation in sexually reproducing organisms. In prophase I of meiosis, the replicated homologous pair of chromosomes comes together in the process called synapsis, and sections of the chromosomes are exchanged. After crossing over, the resultant chromosomes are neither entirely maternal nor entirely paternal but contain genes from both parents.

Unfortunately, in the process of replication and crossing over, the body sometimes makes mistakes. When there is an error during meiosis, the result is a chromosome in the wrong place. We call this a chromosomal abnormality. There are two main subdivisions of chromosomal

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3 https://www.genome.gov/11508982/chromosome-abnormalities-fact-sheet/
4 ibid
abnormalities. The first category is numerical abnormalities. Numerical abnormalities occur when an individual has the wrong number of chromosomes. Monosomy is when the person is missing one of the chromosomes from a pair. Trisomy is when an individual has more than two chromosomes in what was supposed to be a pair. The second category is called structural abnormalities and exists when the chromosomes have been altered in some way. Deletion is when a portion of the chromosome is missing or has been “deleted”\(^5\). Duplications exist when a portion of the chromosome has been replicated, which results in extra genetic information\(^6\). In translocation a portion of one chromosome is transferred to another chromosome. There are two main types of translocation. In a reciprocal translocation, segments from two different chromosomes have been exchanged. In a Robertsonian translocation, an entire chromosome has attached to another chromosome\(^7\). Inversions occur when a portion of the chromosome has broken off, turned upside down, and reattached\(^8\). As a result, the genetic material is inverted. And finally, “rings” are evident when portion of a chromosome has broken off and formed a circle or ring\(^9\). This can happen with or without loss of genetic material. Most chromosome abnormalities occur as an accident in the egg or sperm. When the abnormality starts in the egg or the sperm, the abnormality is present in every cell of the body because the first pair is used for replication of all other cells. Some abnormalities, however, happen after conception. When this happens, then some cells have the abnormality while the others do not.

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\(^5\) https://www.genome.gov/11508982/chromosome-abnormalities-fact-sheet/
\(^6\) ibid
\(^7\) https://www.genome.gov/11508982/chromosome-abnormalities-fact-sheet/
\(^8\) ibid
\(^9\) ibid
Chromosome abnormalities can also be inherited from a parent, such as a translocation, or be "de novo" (new to the individual).  

Chromosomal abnormalities can also be split up into two other categories. Those that affect the sex chromosomes and those that do not. Of the 46 chromosomes, the first 22 pairs are called autosomes, and they have nothing to do with the expressions of a person's gender. But the final and 23rd pair of chromosomes are called the sex chromosomes and they determine a person's gender as either female (XX) or male (XY).

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**History of Gender Verification**

Gender verification or gender “testing” became a common practice in the 1960’s. Women began participating in sporting events as early as the 1920’s, but it wasn’t until after World War II that significant numbers of women started to compete in sports at the elite level. As more women started to participate in sports, the number of sporting events open to women also started to rise. The explosion of female athletes into the sporting world led to a marked exponential improvement in performances, and women were soon competing near the same level as men, if not the same or even better. But as their performance peaked in the 1960’s, cold war rivals started to circulate rumors about the “femaleness” of certain female athletes in sports, who

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10 ibid  
11 [https://www.genome.gov/26524120/chromosomes-fact-sheet/](https://www.genome.gov/26524120/chromosomes-fact-sheet/)  
were also unsurprisingly usually some of the highest performers\textsuperscript{13}. Critics of the athletes used their high performance as evidence to call the athlete's gender into question. This movement led to the initiation of science into sports as a way to safeguard fair competition. The gender verification tests were originally meant to protect the female athletes, by stopping men disguised as women from competing in the women only sporting events and dominating the competition.\textsuperscript{14} The only two problems are that the tests are humiliating for the women who had to go through extensive physical and chemical analysis, and that the tests have never caught even one male imposter, only victims of genetic abnormalities.

The original test for gender verification tests forced the women to parade naked in front of a panel of gynecologists and were consent to visual inspection of their genitalia. Originally implemented at the 1966 European Athletics Championship in Budapest, all female competitors were required to come before a panel of doctors and acquire a medical certificate affirming their gender before they were eligible to participate in competitive sport. While the tests were humiliating for the female athletes who all of the sudden had to prove they were women, not one imposter was caught.

Two years later the International Olympic Committee (IOC) introduced the sex chromatin test at the 1968 Grenoble Winter Olympic Games, and used it again two years later at the Mexico Summer Olympic Games\textsuperscript{15}. The sex chromatin test was a simple way of discovering the athletes sex chromosomes as either XX or XY by looking for the presence of Barr bodies\textsuperscript{16}. Barr bodies are small, dense structures in the cell nuclei of females that consist of a condensed,

\textsuperscript{13} ibid
\textsuperscript{14} ibid
\textsuperscript{16} ibid
inactive X chromosome. Scientists and doctors were able to take a cheek swab from the athlete to determine if there was a Barr body present in the nucleus. If there wasn’t, then the athlete was not a female genetically. For many years this test was regarded as the decisive diagnostic test for genetic femaleness. However, as pointed out by Finnish geneticist Albert De La Chapelle since the test’s inception, it failed to serve it’s intended purpose. De La Chapelle argued that the test was meant to catch imposters, but all it did was catch women with chromosomal conditions that caused no gender related advantages, while failing to catch the women with hormonal conditions that could give them an advantage over the other female competitors, namely conditions that caused masculine muscle development. The gender verification tests that the athletic organizations were using provided potentially inaccurate results that “undermined the efficacy of sex chromatin for human sex determination and differentiation, and to diagnose rare genetic abnormalities.” Initially the tests were meant to stop men from competing in the women's events disguised as women, but in the last couple of decades as scientific technology has increased we have become acutely aware that not everyone fits into the black and white gender boxes that are male and female. Athletes started to resist the tests, even boycotting certain athletic competitions in protest of the unfairness. Many legal experts familiar with sports law argue that from a legal and human rights standpoint, forcing a person to prove their femininity was unconstitutional. The only problem was that not everyone in the world abides by the same constitution, and international athletic governing bodies are free to decide on any constitution.

19 ibid
20 ibid
they want to govern themselves. Scientists also argued that the sex chromatin test stressed the role of the sex chromosomes in determining gender. Science has told us that this is misleading in determining a person's masculinity or femininity because once the sex chromosomes have told the body to produce either testes or ovaries, they cease to play a role in the differentiation of sex. As the body grows and matures, other gender factors such as hormone levels, internal and external organs, environmental and social phenotype, and the psychosocial predisposition of the person become more decisive factors. However, the IOC and the international federations ignored all the scientific evidence and the human rights violations and continued to apply the sex chromatin test for decades against the advice and recommendations of geneticists and medical experts.

Finally, in 1990 the International Association of Athletics Federations (IAAF) held a workshop that included geneticists, pediatricians, endocrinologists, psychiatrists, sports governors, and women athletes. During the workshop they really broke down the facts and eventually the IAAF council altered their ideals and concluded five facts. One, that women with birth defects affecting their sex chromosomes possess no unfair advantage and should be allowed to compete as females. Two, The only purpose of gender verification tests was to prevent men from masquerading as women, and they had never caught even one imposter. Three, people who have been legally and psycho-socially female since birth should be eligible to compete as women despite their chromosomal pattern. Four, post-pubertal gender-reassignment cases should be handled on a case by case basis. And finally, five, Women athletes should still undergo pre-

22 ibid
participation health examinations. This was a small win for female athletes and science for that matter. But unfortunately, the IAAF was ambiguous in their criteria for gender examinations and therefore no real change was ever affected.

Unlike the IAAF, the IOC refused to change its stance on gender verification. The IOC did move from using the sex-chromatin test to DNA based methods for determining the presence of an XY sex chromosome, but even though the science moved forward it was still the same archaic principle behind the tests. But the world started to rally behind the unfairness of the IOC’s refusal to abolish gender verification tests. At the 1994 Lillehammer Olympics, the Norwegian government denied the IOC assistance with sex verification tests declaring them illegal and unethical. However, it wasn’t until the IOC executive committee convened in Seoul in 1999 that they unanimously decided to follow the IAAF in discontinuing the practice of gender verification nearly 10 years later. Since that landmark decision the Olympic games have been gender verification free at Sydney, Salt Lake City, Athens, Torino, Beijing, Vancouver, London, Sochi, and Rio, and Pyeongchang. The International Volleyball Federation was the last international governing body to discontinue the use of gender verification tests in 2004, marking 20 years before everyone listened to Dr. De La Chapelle and his protests of injustice.

Maria Patino

Maria Patino was a world famous Spanish hurdler traveling to compete in the World University Games held in Kobe, Japan in 1985. At these particular games Patino would be required to take a gender verification test to prove that she was a female because she had forgotten her

23 ibid
24 ibid
25 Maria’s Story, www.aissg.org/articles/MARIA.HTM
“femininity” card at home in Spain. But Maria Patino was a woman, she had been one her whole life and she had already passed several gender verification tests already in her career.

When she showed up for her Buccal smear, a scraping of skin cells from the inside of the cheek, Patino was told that she was genetically a male. The science behind the Buccal smear is that when the cheek cells are stained and put under a microscope, cells with XX (female) Chromosomes would show a dark mass in the cell's nucleus called a barr body. If the cell was XY, then no dark spot would appear, and Maria’s cells did not develop a dark spot when stained.

Maria was barred from competition at the games in Japan. After ruling her a man in disguise, meet officials advised her to fake an injury and leave the competition quietly. When she returned home to Spain, the president of the Spanish Athletic Federation (SAF) advised her to retire and fade into the background quietly. Maria was deemed a disgrace to her country for which she had won so many gold medals. But Maria knew she was a woman, and she was convinced that she was just as much a female as any of her competitors were, so she continued to train and compete. In late 1985 Maria entered a meet in Spain. She won her event and was promptly cut from the Spanish national team and SAF stripped her of all her titles and medals and banned her from competing. Maria shares her side in an article she wrote for Lancet in
2005. “I was told to feign an injury and to withdraw from racing quietly, graciously, and permanently. I refused. When I crossed the line first in the 60-meter hurdles, my story was leaked to the press. I was expelled from our athletes’ residence, my sports scholarship was revoked, and my running times were erased from my country’s athletics records. I felt ashamed and embarrassed. I lost friends, my fiancé, hope, and energy. But I knew that I was a woman, and that my genetic difference gave me no unfair physical advantage. I could hardly pretend to be a man; I have breasts and a vagina. I never cheated. I fought my disqualification.”

Maria then entered the limbo between science and athletics. Maria was right in the fact that she was a female. She had been born a female, with female parts. Her parents took her home and raised a daughter. But the scientists weren’t wrong either. Maria didn’t have a Barr body which meant that she was XY, genetically male. It turns out that Maria was suffering from the genetic chromosomal defect named Androgen Insensitivity Syndrome. When Maria was developing in her mother’s womb she lacked the “master switch” to “turn on” her male hormones. Without the male hormones like Testosterone being produced, Maria’s testes developed into ovaries, both internal and external components of the reproductive system were transformed, and she developed into a phenotypic woman, even though her chromosomes were coded as a man. Apparently the “default setting” on human bodies is female, so unless the maturation process is diverted by the production of testosterone, the body will develop as a female, as was the case with Maria. Maria Patino writes” It is as if the God of the Bible, in a departure from the usual story, actually made Eve first, then took one of

26 Martínez-Patiño, María José. “A Woman Tried and Tested.” The Lancet, 2005,
her ribs, added some testosterone and other male hormones, and presto: Adam,”27 which challenges the conventional idea of how gender and the body develops.

After two and a half years of fighting the system Maria was reinstated as a competitor by the International Amateur Athletics Federation (IAAF). It took over two years of finding support in the athletic community of people who were willing to challenge the normal conceptions of femininity. Patino credits three people specifically in aiding her in winning her case with the IAAF. The Finnish geneticist Albert de la Chapelle, who was an early, vocal opponent of blanket chromosome testing; an American coach and journalist named Alison Carlson, who educated athletes about the ethical difficulties of gender verification; and an unnamed sympathetic Spanish professor who gathered her medical evidence and presented the scientific reasons why her case should be reviewed during the Olympic Medical Commission meetings at the Games in Seoul, 1988.28 Maria wrote “They all encouraged me in my endeavor to change the regulations and the mindset of sports administrators about perceived advantage in women with congenital differences.”29

Coverage of Maria’s case helped to trigger the cascade of events that eventually led to the end of blanket chromosome testing. Maria had a powerful message about her situation. She writes “I paid a high price for my license [to compete]—my story was told, dissected, and discussed in a very public way— and my victory was bittersweet. After 3 years away from sports, my momentum was lost. I trained, hoping to qualify for the 1992 Olympics in Barcelona, Spain, but missed the mark at the trials by ten hundredths of a second. I have helped other

27 Maria’s Story, www.aissg.org/articles/MARIA.HTM.
28 Martínez-Patiño, María José. “A Woman Tried and Tested.” The Lancet, 2005,
29 ibid
sportswomen with genetic variance participate without fear, however, and my experience has made me stronger; having had my womanliness tested—literally and figuratively—I suspect I have a surer sense of my femininity than many women.”  

While Maria was fighting, very publicly, about her womanhood she missed her chance to become the world champion she could have been. She lost friends, loved ones, and her dreams of athletic excellence. However, she came out of that portion of her life as a stronger woman. Maria has found international acclaim, if not in the way she originally intended. She retired from sport in 1992, and studied political science and sports science. Her doctoral thesis analyses the changing role of women in sport and the difficulties they face. She teaches at the University of Vigo, Spain, and lectures worldwide.  

**Dutee Chand**

Dutee Chand is an Olympic sprinter from a rural village named Gopalpur, in Eastern India. She was regarded as a miracle in her village for her athletic gift. She was raised in a mud hut with intermittent electricity and no running water or a toilet. Her parents were weavers who made only $8 a week and were illiterate. Chand used her gift to escape the overwhelming poverty into which she was born. Chand began running when she was only 4 years old. Her older sister Saraswati was also a competitive runner and the two would run

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31 ibid
together on the banks of the Brahmani River\textsuperscript{33}. Both the girls ran barefoot as they had to
protect their only pair of shoes, rubber flip flops, that they could not afford to replace. When
Chand was only 7, her parents urged her to give up running and become a weaver as they were.
But Chand didn’t want to walk in her parents’ footsteps. She continued to run and her athletic
acclaim got the attention of the local government who gave her family eggs, meat, and food
they would not have been able to afford so that Chand was well nourished to race. Her sister
Saraswati measured her foot with a string and rode a bus three hours away to buy her sister a
pair of running shoes that brought Duttee to tears. The sacrifices she and her family had made
paid off when in 2010, Chand was accepted into a state-sponsored sports program 2 hours from
her village. While she reports that she missed home, she now had her own dorm room, plenty
of food, electricity, running water, and indoor plumbing.\textsuperscript{34} At 10 years old she began sending
her prize money home to help support her family.

In 2014, Chand won the gold medal in both the 200-meter sprint, and the 4 by 400
meter relay in the Asian Junior Athletics Championships held in Taipei, Taiwan. Her stellar
performance prompted a call from the Athletics Federation of India, who asked her to come to
Delhi for a meeting. Her surprising wins had prompted coaches and competitors alike to make
comments regarding her masculine appearance. When Chand arrived in Delhi she was taken to
a clinic and told that she was there for a doping test. The doctor said that they were going to do
an ultrasound rather than the typical urine test and blood test because there was no nurse

\textsuperscript{33} Macur, Juliet. “What Qualifies a Woman to Compete as a Woman? An Ugly Fight Resumes.” The New York
\textsuperscript{34} ibid
available. And when the doctor was questioned about this odd change, he assured Chand that this was routine.\(^\text{35}\) However, this was not a routine procedure and three days later Chand was sent a letter saying she had to report for gender verification tests. Chand was sent to a private hospital in Bangalore where they drew blood, performed a chromosomal analysis, an MRI, and a disturbingly thorough examination of her reproductive organs that she found “mortifying.”\(^\text{36}\) The ultimate conclusion was that Chand suffered from a condition known as hyperandrogenism that showed she had elevated levels of testosterone. The IAAF barred Chand from competing as a woman and the Athletics Federation of India dropped her from the national team. This was more personal for Chand as she supported her family on her earnings as a sprinter. She fought her disqualification and filed a lawsuit for it to be reversed. Chand stated “I have not doped or cheated...I am unable to understand why I am asked to fix my body in a certain way simply for participation as a woman. I was born a woman, reared up as a woman, I identify as a woman, and I believe I should be allowed to compete with other women, many of whom are either taller than me or come from privileged backgrounds that most certainly give them an edge over me.”\(^\text{37}\) Chand was forced to take her case to the International Court of Arbitration for sport to argue the unfairness of the IAAF’s testosterone policy. In March 2014, a panel of three judges hear Chands case and the testimony of sixteen witnesses including scientists, sports officials, and athletes. Chands witnesses pointed out that there are over 200 known biological abnormalities that researchers have identified that offer specific competitive advantages.


\(^{36}\) ibid

\(^{37}\) ibid
including increased aerobic capacity, long limbs, hyper flexible joints, and percentage of fiber types. None of these variables are regulated if the condition is natural, so why should Chand have to regulate her testosterone when it isn’t even proved to give her a competitive advantage. Ultimately the court decided that current scientific evidence does not prove without a doubt that increased testosterone levels provide an unfair advantage. The court decided “While the evidence indicates that higher levels of naturally occurring Testosterone may increase athletic performance, the Panel is not satisfied that the degree of that advantage is more significant than the advantage derived from the numerous other variables which the parties acknowledge also affect female athletic performance: for example, nutrition, access to specialist training facilities and coaching and other genetic and biological variations.” The Panel suspended the IAAF testosterone policy until July 2017, and in that time the IAAF would have to scientifically prove that testosterone supplies an unfair advantage, or drop their policy forever. In the meantime, Chand would be allowed to compete as she was. After her win she exclaimed “This wasn’t just about me, but about all women like me, who come from different backgrounds. It is mostly people from poorer backgrounds that come into running - people who know they will get food, housing, a job, if they run well. Richer people can pay their way to become doctors, engineers; poor people don’t even know about their own medical challenges.” By the suspension of the testosterone policy Chand was able to train and compete in the Rio Olympic games.

39 ibid
The results of Chand's private medical record were withheld from the media, however when the news broke of her “failing” the gender verification test she was criticized in the media for not being a “normal” woman.\textsuperscript{40} Chand related her feelings about her experience to a reporter at the New York Times saying “some in the news were saying that I was a boy, and some said I was a transsexual...I felt naked. I am a human being, but I felt I was an animal. I wondered how I would live with so much humiliation.”\textsuperscript{41} This was a real concern for athletes in conservative countries. Only a few short years earlier another Indian sprinter named Santhi Soundarajan was subjected to, and subsequently failed, a gender test. She was humiliated and ridiculed in the media and eventually tried to take her own life by swallowing poison. When years later the same thing happened to another younger Indian runner Soundarajan was in a position to extend her support to Chand. She publicly denounced the lack of sensitivity shown toward Chand in the media and demanded that all steps possible to protect Chand’s budding career were taken. Soundarajan wanted to see Chand return to the track, as she was never able to do. By winning her case, Chand affected the lives of all the female athletes with her condition. By fighting this unfair policy Chand gave herself the chance to become an Olympic champion. In all the time she spent fighting her court case, she was losing out on training time and by the time she won, she was dangerously close to losing her window of opportunity. If she didn’t qualify for Rio, the IAAF might have found evidence against her before the next Olympic cycle. On June 25th, 2015 Chand finally qualified for the Rio Olympics running the 100 meters in


\textsuperscript{41} ibid
11.24 seconds in Kazakhstan. She was the first Indian woman to run the 100 meters at the Olympics since 1980, and while she failed to move past the preliminary heats she made her dream come true and changed the lives of women all over the world. Chand is still currently running and is considering a law career after she hangs up her running shoes.

Caster Semenya

Caster Semenya was born in a tiny village in northern South Africa. She is a celebrated runner but had originally only started running as training for her promising soccer career. In 2009, Semenya seemed to come out of nowhere to win the 800-meter race prompting questions about where she came from. After her win competitors and spectators alike called her a man and started to raise questions regarding her gender, because apparently it wasn’t possible that she was just better than everyone else that competed that day. This prompted Pierre Weiss, the general secretary of the IAAF to release a statement saying that Semenya “is a woman, but maybe not 100 percent.” The following backlash from the athletic community and the greater population caused Semenya to be barred from competition while she was forced to subject herself to invasive gender verification tests if she ever wanted to compete again. A bioethicist from Stanford University named Katrina Karkazis protested this decision

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[^2]: ibid
stating that Semenya was only being punished for “being too fast and supposedly too masculine” by our narrow western standards of beauty.44

Following extensive tests Semenya was cleared to compete again and while her gender verification tests were never publicly published in order to protect her right to privacy, they were highly publicized and speculated about. Semenya became the center of a media storm that was solely focused on telling her whether she was a woman or not. Semenya’s medical documents were “leaked” causing an ethical uproar. Athletics of South Africa (ASA) president Leonard Chuene admitted on September 19th, 2009 to subjecting Semenya to gender verification testing without her knowledge.45 He had previously lied to Semenya about the purpose of the tests and to others about having performed the tests. He also ignored a request from ASA team doctor Harold Adams to withdraw Semenya from the World Championships over concerns about the need to keep her medical records confidential. With the leaking of her private medical records to the world, it was confirmed that Semeya had a condition called hyperandrogenism that caused her to have elevated levels of testosterone. The IAAF instituted a policy in 2011 as a result of Semenya’s condition limiting female testosterone levels to 10 nanomoles per liter of blood, or the lower end of the male hormone range. In order to keep competing as women, the athletes would have to take hormone suppressing drugs to keep their testosterone levels in normal ranges, or have their internal testes removed surgically.

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In 2015, the Court of Arbitration for Sport, the supreme court of international sport, stated that we are “unable to conclude that hyperandrogenic female athletes may benefit from such a significant performance advantage that it is necessary to exclude them from competing in the female category.”[^46] This ruling allowed Semenya to compete as she was naturally, and she went on to win the gold medal in the 800 meter race at the Rio Olympics in 2016. Semenya has every right to be bitter about what she has been through. Every part of her biology, identity, and life have been picked apart by anyone with internet access and an opinion, but she continues to live her life authentically. In 2009 at the height of her controversy she told a South African magazine “God made me the way I am, and I accept myself...I am who I am, and I’m proud of myself.”[^47]

**Ethical Analysis**

There exists a huge disconnect between gender and sex and what they really mean. Gender used to be black and white, but as science catches up we really start to see gender in shades of grey. Because we can’t put gender in a nice neat box anymore, issues arise as to how to govern sport competitions in a way that is fair for everyone. The mythical “line” that clearly distinguishes “male-ness” from “female-ness” is becoming distorted, and that’s not an opinion, it’s science.

Maria Patino has primary and secondary female sex characteristics. She has “female” parts and many would argue that she is female. But science says that she is XY, making her

[^47]: ibid
genetically male. This is where the water becomes murky because she is clearly neither completely male nor completely female. In her specific case, Maria asserts that she has always been a female and will continue to live out the rest of her life as a woman. In many other cases these tests bring up personal issues that help athletes reconcile feelings towards their gender that had been previously pushed to the bottom of their subconscious and repressed because they would jeopardize their athletic career. Dora Ratjen was a German athlete who competed for Germany in the women's high jump at the 1936 Summer Olympics at Berlin. At the age of 20, she won a gold medal at the European Athletics Championships with a world record high jump of 1.67 meters. But the previous world record holder, Dorothy Tyler-Odam, was not thrilled that her record had been shattered and was reported to have said, “she’s not a woman, she’s a man.” Dora retired in shame and withdrew from the public eye. She changed her name to Heinrich and spent a quiet life with his family until his death in 2008. Ratjen wasn’t trying to cheat by competing as a female when she was male. She had been raised as a female and had female genitalia. Finding out that she was genetically male was a shock, but in the end helped her to reconcile her outward appearance with her inner feelings of her true gender identity.

Over the decades, there have been plenty of claims of gender cheating in sport. People say, if she looks like a man, he must be a man. Veronica Brenner is a Canadian skier who first heard about gender verification when she arrived at the 98 Nagano Japan games. Brenner was

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48 “German High Jumper Dora Ratjen: Was She a Man or a Woman? Is That the Right Question?” The Olympians, 3 July 2016, theolympians.co/2016/07/07/german-high-jumper-dora-ratjen-was-she-a-man-or-a-woman-is-that-the-right-question/
49 ibid
given a femininity card but was irked that “despite the many advances of female athletes in the last half-century, powerful male athletes are celebrated and powerful female athletes are suspect... we’d hear comments all the time: “She’s really strong- she must be part guy.”

And due to the measures of testing in the past, women have had to go through humiliating tests and have been shamed as cheats even if they had no idea that they were living with such “incriminating” conditions. The Times reports that “Estimates of the number of intersex people vary widely, ranging from one in 5,000 to one in 60, because experts dispute which of the myriad conditions to include and how to tally them accurately. Some intersex women, for instance, have XX chromosomes and ovaries, but because of a genetic quirk are born with ambiguous genitalia, neither male nor female. Others have XY chromosomes and undescended testes, but a mutation affecting a key enzyme makes them appear female at birth; they’re raised as girls, though at puberty, rising testosterone levels spur a deeper voice, an elongated clitoris and increased muscle mass. Still other intersex women have XY chromosomes and internal testes but appear female their whole lives, developing rounded hips and breasts, because their cells are insensitive to testosterone. They, like others, may never know their sex development was unusual, unless they’re tested for infertility — or to compete in world-class sports.”

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51 Ibid
Once it has been proven that a limbo exists between the two genders, we have to decide “how do we make competition fair?” Stephane Bermon was a witness from IAAF in Dutee Chand’s trial who stated that “Air pollution, like tobacco smoking, contributes to lung cancer, but one should never have to choose between these two before implementing prevention measures...As a governing body, IAAF has to do its best to ensure a level playing field...These two topics are different but can lead to the same consequence, which is the impossibility for a dedicated athlete to compete and succeed against an opponent who benefits from an unfair advantage”52 However, it is in my opinion that it isn’t fair to exclude intersex athletes, and it’s not fair to the non-affected athletes to compete against athletes with an unfair advantage. But do athletes with disorders of sex development really have a physical advantage over their competitors? Scholars defend inclusion of intersex athletes because the athletes’ physiologies confer no unfair advantage and therefore do not upset any presumed equality of conditions among athletes53. This stance has been termed as the ‘physiological equivalency’ rationale. The conclusion of this approach is summed up by Dr. Katrina Karkazis, a medical anthropologist and bioethicist at the Stanford Center for Biomedical Ethics, Stanford University School of Medicine. Karkazis states “The current scientific evidence, however, does not support the notion that endogenous testosterone confers athletic advantage in any straightforward or predictable way. Even if naturally occurring variation in testosterone

conferred advantage, is that advantage unfair? It bears noting that athletes never begin on a fair playing field; if they were not exceptional in one regard or another, they would not have made it to a prestigious international stage.”\textsuperscript{54} Karkazis make a valid point that sport is inherently unfair. Where you were born, how much money your parents had, what access you had to training facilities, or even basic genetic characteristics like height may bestow an unfair advantage upon an athlete. Intersex athletes are not advantaged (or that even if there was any advantage, it would fall within the normally accepted range of advantage) compared to non-disordered athletes. Therefore, since the athletes sufficiently conform (or will conform) to biological norms of their gender category and do not disrupt the fairness of the sport, there is no reason to exclude them.\textsuperscript{55}

Bruce Kidd, a former Olympic long-distance runner jokes that all Olympians joke that they are “freaks of nature” possessing abnormalities that make them great at what they do. He also contends that if we want athletics to be completely fair then “all athletes should be forced to live in the same place, in the same level of wealth, with access to the same resources.”\textsuperscript{56} There is a genetic disorder called Marfan's Syndrome that is also prevalent among athletes because of the physiological advantages it lends to athletic performance. Marfan Syndrome is a genetic mutation that affects the body’s connective tissue. Connective tissue holds all the body’s cells, organs and tissue together, and also plays an important role in helping the body


\textsuperscript{55} ibed

grow and develop properly. Some of the signs of Marfan’s Syndrome are Long arms, legs and fingers tall and thin body type, curved spine, chest sinks in or sticks out, flexible joints, and flat feet. Some of these are things we routinely identify as being markers of a great athlete. The problem with Marfan’s Syndrome is that it is also a silent killer. The genetic mutation also causes an enlarged aorta, sudden lung collapse and eye problems, including severe nearsightedness, dislocated lens, detached retina, early glaucoma, and early cataracts. Some of which can be fatal to the athlete. The life expectancy of an athlete with Marfan's Syndrome is 2/3 that of a mutation free athlete.

This leads me to question why athletes with a life threatening chromosomal abnormality are celebrated while others are humiliated out of competition. It has been proven that intersex athletes have no advantage that can’t be attained by non-affected athletes through training. This leads me to conclude that the "fairness" is a result of cultural bias. Intersex athletes don’t fit in the neat and tidy gender norms, and their very existence threatens many conservative countries all over the world. Madeleine Pape is an Olympic runner from Australia who competed against Caster Semenya at the 2009 Track and Field World Championships and lost. Pape was once disillusioned with the sport because she felt it was unfair for her to have to compete against Semenya. But after retiring Pape started a PhD program in Sociology at the University of Wisconsin focusing on Women in Sport. Pape said “At the time, I felt people like Caster shouldn’t be allowed to compete but with my running days behind me, I had the space

58 ibid
59 ibid
60 ibid
to think more critically about all that...Until that point, I had no idea that the science of sex-differences is extremely contested and has shifted over time., as have the regulations in sports, which change but don’t improve as they try to get at the same questions." When Pape gained more knowledge about the controversy, she came to have a deeper understanding about the athletes she once condemned. Pape writes “Women who have fought so hard for the right to compete and for sustainable financial support can feel threatened by the rising success of a faster competitor. Especially if that athlete is non-gender-conforming and is married to another woman, as Semenya is.” Pape seems to be implying that Semenya is persecuted not only for her chromosomal abnormality, but also for her failure to conform to “typical” gender norms. The fact is that there are many athletes whose performance is more outstanding than Semenya’s. American athletes have dominated many sports over the years but in recent years no women have seemed to dominate gymnastics like Simone Biles or swimming like Katie Ledecky. But, because they both conform to their gender norms, no one has called their gender into question. “When we look at it objectively, Caster Semenya is no more exceptional than [Biles or Ledecky] are,” Pape claims, “So why do we celebrate them while persecuting Semenya?” I believe that one of the possible reasons is that Biles and Ledecky are athletes from the United States, while Semenya, Chand, and Patino came from countries with rigid conservative social structures. They were considered outliers because they didn’t fit into the norm. They had to prove that they belonged in their own gender category simply because their

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stellar performance put their gender under scrutiny. This is unfair, because we are treating them as if they are guilty until they prove themselves innocent. We believe that intersex athletes are sinister masterminds that have set out to defraud the whole sporting institution by pretending to be a woman to win. In actuality the governing bodies are “catching” women with genetic mutations that they were probably unaware they even had. After thoroughly humiliating these athletes in the public eye, many retire in shame even though they have done nothing wrong. The I.A.A.F. had a noble cause in keeping athletics fair, but their crusade to police gender has only ended up hurting women and has yet to catch an imposter. If the intersex athlete has no advantage over their competitors, then they should be allowed to compete, regardless of genetic mutation.
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