

What Produces the Sexual Identity of Intersexes?

A study of people with ambiguous genitalia gives unusual support to the prime role of the environment and upbringing in shaping human sexuality. Most intersexes (people of ambiguous gender appearance) who have come to the attention of researchers have opted for the gender of upbringing (rather than their chromosomal gender) when puberty has revealed a contrary genetic gender and they have been offered corrective medical intervention. Only a small minority are significantly unhappy with the outcome..

Sometimes babies are born with such ambiguous genitalia that medical staff do not know whether the child is a boy or a girl. Until about the 1980s, parents instructed to raise these children in one gender or other often found them developing physically (usually with the onset of puberty) contrary to the gender of upbringing. But, when these children were given the option of corrective surgery and hormonal intervention at puberty, 90 percent of those whose cases have been researched opted for the gender in which they had been raised, rather than their biological gender, even in the face of quite contrary physical characteristics. In many cases, these children grew up to develop gender behaviors consistent with their gender of choice, rather than their biological gender. They felt attraction, experienced erotic arousal, fell in love in ways characteristic of their chosen gender, married, and raised children.

Today diagnosis is much more sophisticated and medical options much wider. The situation varies a little from country to country, showing social conditioning is important. Many more elect to change from female to male than the reverse because of the perceived benefits of being male, but overall, lumping all intersex conditions together, about 90% still choose to remain in the gender of upbringing.

A Lesson In Biology

Almost everyone, including homosexuals and lesbians, is born chromosomally female (XX) or chromosomally male (XY). When a male sperm carrying twenty-three chromosomes unites with the female ovum, also carrying twenty-three chromosomes, the fertilized egg quickly becomes a forty-six chromosome cell of twenty-three pairs, one of each pair from the father, one from the mother. All the chromosomes carry the genetic material that gives us our biological characteristics, but the twenty-third pair is the sex chromosomes, usually comprised of one X chromosome inherited from the mother and an X or Y chromosome inherited from the father. An XX combination in the fertilized egg produces a female, and an XY combination produces a male. Sometimes these standard combinations do not happen, and rare combinations result for reasons that are still not very clear to researchers. One of the X chromosomes can be "lost," leaving only a single X. These fertilized X cells still grow normally, but produce individuals who are very short (4 ½-5ft, 137 cm+) and physically female, but have no ovaries and are infertile, a condition called Turner's syndrome. Some cells end up XXX, resulting in women with a normal female body, but diminished fertility, and sometimes mental retardation. Males can be XYY, with male body type, reduced fertility, and increased height; XXY or XXXY (Klinefelter's syndrome) both cause male body type, but with unusually small penises, shrunken testes, and varying but low production of the male hormone, testosterone, so that at puberty they become only moderately masculine and have scant body hair. The percentage of homosexuals among people with Klinefelter's syndrome is about typical for the general population (contrary to a commonly circulating myth), but about half of those with the syndrome have no interest in any type of sex (they are quite prone to sexual anxiety), partly due to their physical attributes. Such varied sexuality in Klinefelters means their chromosomal pattern is not

forcing any particular sexuality upon them.¹

There are all sorts of rare combinations of X and Y, but, in general, if people have an XY or XX combination of some kind they will develop physically as male or female respectively.²

Overwhelming Effects of Rearing

John Money, Anke Ehrhardt, and John and Joan Hampson, at the Johns Hopkins Medical School in Baltimore, Maryland, spent a lifetime studying unusual sexual conditions and intersexes. What they found in the sixties about the role of upbringing in the formation of gender identity and sexual orientation led them to the conclusion that the influence of upbringing and rearing was so overwhelming that it was as if a new-born child was a blank slate, written upon only by the influence of upbringing and socialization.³ This ultimately proved to be too extreme a conclusion.

In a summary of all cases of intersexes that had come to their attention (particularly the work of the Hampsons), Money and Ehrhardt said about 90 percent chose to remain in their gender of upbringing in spite of contrary biology; that is, despite some or any of the following: contrary chromosomes, gonads, hormonal sex, internal sexual organs or external genital appearance.³ They remarked that of that 10 percent who changed their gender, almost all of them made a female to male change. Although the 90 percent established a gender identity consistent with their sex of choice, they did not do it without “difficulty, embarrassment, and shame”. This represented the situation until the end of the ‘70s.

Boy Raised As a Girl

One of Money’s cases² was a boy, one of normal identical twin boys, biologically male in every respect, who suffered a surgical mishap during circumcision by electrocautery at the age of seven months. His penis was cut off flush with the abdominal wall. After months of agonizing, the parents decided, when the boy was seventeen months old, to raise him as a girl, and doctors performed the first stages of feminizing surgery. The child was called Joan, wore girl’s clothing and hairstyle, and the parents were regularly counselled how to raise her under the circumstances. John Money touted this as a perfect case showing the malleability of gender because the reports seemed to show the “girl” was adapting well to the change. Her mother made a special effort to keep her in dresses because she was initially resistant to them and preferred jeans. By the age of four she had a clear preference for dresses over slacks, wore bracelets and hair-ribbons, and took pride in her long hair. But Joan was tomboyish, had a lot of energy, and was often the dominant one in a girls’ group; mother tried to teach her to be more ladylike. Estrogen therapy was planned at puberty, and further surgery after that.

When the girl was about thirteen, she was interviewed by the British Broadcasting Corporation (BBC) and three psychiatrists, who concluded her gender identity was insecure. She refused to talk about sex. When asked to draw a human figure she drew a man because “women are too difficult.” She complained that men had it good in life and women didn’t. She had found it difficult to be accepted in her group of girls because she was not very attractive, and because her rather clumsy gait had gained her the nickname “cavewoman.” She thought she would rather like to be a mechanic. The BBC panel thought that the transformation had been rather shaky, perhaps even inadvisable. It seemed the attempt to environmentally over-ride the basic biology was a failure and “Joan” became the subject of a scholarly fight between Money and other researchers who believed he should never have been brought up as a girl.⁴ Some of them took the debacle as evidence that gender identity was so fixed at birth, that efforts to change it were futile. Money was accused of suppressing some of the evidence he had accumulated that adaptation to the new sex was much less than perfect. It all came to a head in early 1997⁵ when it was revealed that at the time of the BBC interview the cat was already out of the bag; Joan had found out three years before that she was really a boy. A year before the program she had rejected hormone treatment for feminization. (No wonder she looked somewhat masculine.) A year after the program she began a two year program of penis reconstruction and began to call herself John. Eventually he married a woman several years his senior and adopted her children. Alas, several years later he committed suicide, just as his co-twin had, some years before, so this complicated story may be further complicated by some mental illness.

A confusing picture-but one that shows, nevertheless, that gender is not written into our genes or gonads. It is malleable and responds strongly to environmental signals. Before the “cat was out of the bag,”

the boy was behaving to a large degree like the girl he was being raised to be. Afterwards he decided to co-operate with his then known genetic biology rather than suppress it medically, and he also began the corresponding psychological gender shift.

This tragic story is well known, and even been the subject of a book, but it is less well known that Bradley et al. (1998)¹¹ reported a (non-twin) case in which the same accident happened much earlier in life. The boy, brought up as female, clearly identified as female even after many years, reaching young adulthood, but said her sexual *orientation* was bisexual. So this story is the opposite of the one above – sometimes reassignment can work.

Some researchers have taken issue with Money and Ehrhardt and the Hampsons, saying that humans are not blank slates at birth, but that there is a gender predisposition. One sex researcher in Hawaii, Milton Diamond, argues for a “prenatal (biological) organization,” a “built-in bias with which a person interacts with his environment,” but an extraordinary flexibility to adjust to an erroneously imposed gender.⁶

There is a later collection of data like this – Meyer-Bahlburg et al.¹², in which they managed to find no less than 7 people whose early accidents had forced the amputation of their penises. They were raised as female, and 69% stayed that way. One was not happy in her gender assignment (“gender dysphoria”). Telling the person the medical details of the accident did make a difference – half of those told the medical facts before puberty decided to change to male.

Rather similarly, of 16 boys born through a prenatal biological accident without penises, brought up as female, 12 or 75% chose to remain that way though 2 were rather unhappy with the assignment. Of another 17 with the same condition brought up as males, all remained that way. This shows a theme already apparent – there is a preference in most societies to remain or become male. The authors concluded:

The data do not support a theory of full biological determination of gender identity development by prenatal hormones and/or genetic factors, and one must conclude that gender assignment and the concomitant social factors have a major influence on gender outcome. On the other hand a number of female-raised individuals did change gender to male and others developed a possible gender-dysphoria, which indicates that gender assignment does not dictate outcome either.

The critical word is “dictate”. But what is surprising is how successful upbringing in a contradictory gender actually was.

Such cases are very rare – what happens on average with the more common conditions? Do intersex people stay in the sex of upbringing? We will try and summarise. First we describe one of the most common.

Adrenogenital Syndrome In Females

This condition, which affects female fetuses, is the result of a genetic defect; the adrenal glands do not produce their proper hormone, cortisone. Instead, they release a precursor product, which acts as a male hormone, an androgen. This enters the bloodstream of the female fetus too late to masculinize the internal reproductive system, which is already female, but in time to masculinize the external genitalia. The result is a chromosomal female with a uterus and two ovaries, but anything from a grossly enlarged clitoris resembling a penis with partially fused labia (resembling testicles) to a fully formed penis and empty scrotum. Because people with this condition continue to produce androgen for the rest of their lives, they must also take doses of the antidote, cortisone, to counteract it: in childhood, to stop an excessively masculine puberty which comes eight to ten years too early, but also in adulthood. Although the ovaries continue to secrete normal levels of female hormones, these are overwhelmed by the high amounts of androgen being produced by the adrenal gland.

The percentage of these women who are brought up female and remain female varies with country and research group: Meyer-Bahlburg¹³, 9% changed. Dessens¹⁴, 5% changed. Long¹⁵, 0% (they became indistinguishable from controls by adulthood) Slijper¹⁶, 13% changed; Reiner²¹, 22% changed from female. So overall these figures average to a 90% rate of those who elect not to change.

Turner's Syndrome

We met this condition above. It has an interesting bearing on the subject. Because of their lack of ovaries, or non-functional ovaries, all Turner's Syndrome people take estrogen throughout their lives. Some marry, and recently some researchers surveyed how they were functioning sexually. The women were in two groups – those in relationships and those not. Approximately 30% of the study group were involved in a partner relationship, and this group scored within the average range for heterosexual women on fantasy, arousal, experience, orgasm. The authors concluded they had relatively normal overall sexual function, but the majority of unpartnered women reported very low level sexual functioning.²⁵

Since both were on estrogen this hormone seems to be a negligible contributor. The conclusion is that sexual functioning arises overwhelmingly out of the partner relationship.

Biologically-Induced Gender Change?

One special genetic condition seems to be a possible major exception to the general rule of staying with the sex of upbringing. This is the deficiency of an enzyme called 5- α -reductase. This deficiency prevents formation of one of the male hormones, dihydrotestosterone, so that the usual prenatal surge of testosterone that differentiates a boy from a girl before birth does not occur, and external genitalia are ambiguous. If the condition is not diagnosed and treated, everyone gets a shock at puberty when the testes become detectable and the body becomes masculine. The researchers studied thirty-eight of these cases in the Dominican Republic, particularly eighteen who were "unambiguously raised as girls."⁷ Their findings? At puberty or after, seventeen of these children changed to a male gender identity and developed an erotic interest in women. Many became heads of families. The researchers argued that androgens made a "strong and definite contribution to male gender identity."

But the conclusion is not as straightforward as it seems. Critics of the research argue that men had much greater status and prestige in Dominican society, and that together with sudden masculinization, a choice to be male could be strongly culturally influenced. Certainly the Dominican study seems to stand alone in the strength of its argument for a hormonal basis to gender identity. Another researcher into 5- α -reductase deficiency drew an opposite conclusion. Gilbert Herdt, the most prominent researcher among the Sambia of the eastern highlands of Papua New Guinea, found five cases of 5- α reductase deficiency in his study group.⁸ In this case the individuals were raised as girls but on their sudden masculine development at marriageable age (puberty), were treated as a third sex. Although the Sambia are a strongly misogynist culture, there was no attempt as in the Dominican Republic to adopt a male gender, because the culture forbade it; the Sambia believed a boy could only become a man through ingestion of male semen in prescribed regular fellatio in childhood. Herdt argues that gender identity is therefore culture dependent rather than hormone dependent. Herdt also maintained that only thirteen in the Dominican Republic study, not 17, lived unequivocally as men. In an almost identical condition found in the Gaza strip, only 28 percent changed gender at puberty.⁹

In the West, of those who have the 5- α -reductase deficiency, only a small percentage elect to change gender at puberty, and they find it difficult.¹⁰ Ninety percent are content to remain in the gender of upbringing (female), possibly because the perceived rewards of being a Western woman are greater than in other cultures.

Other change

In India¹⁷ of 74 intersex patients, all but one remained in the sex of rearing. In Egypt¹⁸ 10% changed. Reiner¹⁹ in a paper from the West, found that of 60 raised as female, 43% declared themselves female but 53% changed to male. This was a rather exceptional group in which there was considerable decision to change.

In Bahrain McCarthy²⁰ found all female patients reassigned the male gender accepted that, but no males accepted a change to female!

In Russia, according to Lev-Ran²¹, all adult patients resisted reassignment and wanted to remain the way they had been brought up!

It was noticeable that a Western group with Cloacal Exstrophy¹² (in which sexual organs are poorly developed and internal organs such as bladder may protrude) had a large percentage – about 33% - of people who wanted to change from female to male and more who were unhappy.

Since the congenital adrenal hyperplasia group predominates (among intersexes) the original estimate of those who wished to change is still probably around 10%. Upbringing is strong, but less so in the West since the days of the Hamptons.

In the last few decades a strong minority opinion has formed that intersex children should be allowed the maximum choice and there should be no medical intervention at all. A human rights ordinance in San Francisco²² sought to make this mandatory. However traditional medical opinion argues strongly²³ that the intersex condition is devastatingly embarrassing for school children and that intervention is easily preferable. More than 92% of intersex children later approve of the early intervention, and in countries such as Vietnam where corrective surgery is not available, intersex adults regret that it wasn't²⁴.

Summary

So if we ask the question “What produces the sexual identity of intersex children?” we have to answer that upbringing greatly predominates – even in modern society, and more so in a less liberal society.

That is about 90 percent of intersexes on record elected to continue in the gender in which they were raised, even in the face of strongly contradictory biological and physical characteristics. If the influence of upbringing is so strong that it can over-ride obvious contrary biological predispositions, then it is clearly more powerful than biology in the development of gender identity, at least in most countries. It becomes impossible to argue that gender identity in chromosomally normal individuals (like homosexuals) is genetically or biologically enforced. In modern Western society, sexuality appears to be about 10 percent genetic and 90 percent environmental. So it is quite plausible that homosexuality is also 10% genetic and 90% environmental.

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