Title: Biased-Interaction Theory of Psychosexual Development: "How Does One Know if One is Male or Female?"

Author: Milton Diamond

Published in: *Sex Roles* (2006) 55:589–600

Keywords: Psychosexual development . Gender development . Genetic-endocrine interactions . Gender comparisons . Role models . Prenatal influences . Organizing factor . Activating factors . Gender identity . Sexual identity . Masculinity . Male . Femininity . Female

---

Abstract: A theory of gender development is presented that incorporates early biological factors that *organize* predispositions in temperament and attitudes. With *activation* of these factors a person interacts in society and comes to identify as male or female. The predispositions establish preferences and aversions the growing child compares with those of others. All individuals compare themselves with others deciding who they are like (*same*) and with whom are they *different*. These experiences and interpretations can then be said to determine how one comes to identify as male or female, man or woman. In retrospect, one can say the person has a gendered brain since it is the brain that structures the individual's basic personality; first with inherent tendencies then with interactions coming from experience.

What it means to be a male or female in any society is repeatedly discussed. With this question, how one develops sexually as a man or woman, is of similarly long debate. This is especially true when one is atypical due to variation in gender behaviors, sexual or gender identity, or sexual orientation. Offered, as important contributions to theoretical understanding, are many available theories ranging from reductionism to constructionist, from environmental to evolutionary to others. In a simplistic way it might be said most often the arguments eventually reduce themselves to debates of nature versus nurture. For the last several decades or so, however, people have begun to recognize that both are inextricably

involved.

Starting some 40 years ago I have advocated the melding of both nature and nurture in an interaction approach to understanding sexual development. This advocacy was stimulated as a response to the then-prevalent theory that one's sexual and gender development was mainly due to social and learning forces. It was expressed thus: "In place of a theory of instinctive masculinity or femininity which is innate, the evidence of hermaphroditism lends support to a conception that psychologically, sexuality is undifferentiated at birth and that it becomes differentiated as masculine or feminine in the course of the various experiences of growing up" (Money, J. G. Hampson, & J. L. Hampson, 1955, p. 308) and "It is more reasonable to suppose simply that, like hermaphrodites, all the human race follow the same pattern, namely, of psychological undifferentiation at birth" (Money, 1963, p. 820).

In countering that position I expressed my view, supported by evidence available at that time, that human beings were predisposed or "biased" to act in certain ways and that "behavior is a composite of prenatal and postnatal influences with the postnatal factors superimposed on a definite inherent sexuality" (Diamond, 1965, p. 169). I have subsequently written additional papers expanding on the topic (Diamond, 1976, 1979, 1993, 1995, 1997a, 1999, 2002a; Diamond, Binstock, & Kohl, 1996). These articles have extended my theoretical thinking on the development of many facets of sexual expression, from the typical to homosexuality, transsexuality, and Intersexuality. For this special issue of Sex Roles it is appropriate, adding currently available evidence, to reiterate my theory of gender identity development.

In general, biological factors starting from XY chromosomes produce males that develop into boys and then men with whatever characteristics are appropriately seen as masculine for society and females develop into girls and then women with whatever characteristics are appropriately seen as feminine for the same society. Differences from the usual course of development are not seen as "things gone wrong" or errors of development but as to-be-expected occasional variations due to chance interactions of all the variables involved. Since many aspects of this approach to psychosexual development have been presented in previous publications this review will be relatively brief and in a five-step outline form.

> *Biased-Interaction theory* of Psychosexual Development:
> also known as
> *Biased-Predisposition theory* of Psychosexual Development and
> *Same-Different theory* of Psychosexual Development.

1. A person is born with a certain background based upon evolutionary heritage, family genetics, uterine environment, and health. The strongest gestational influences are from genetic and endocrinal organizing forces. *Organizing factors* are those genetic and hormonal influences laid down prenatally that influence adult behaviors once set in motion by pubertal or post pubertal *activation processes* or events. It is these various organizing factors that are at the heart of the theory. *Organizing factors* influence or bias subsequent responses of the individual; they predispose the person to manifest behaviors and attitudes that have come to be recognized as predominantly masculine or feminine. The basis for this belief, from experience and experimental evidences both classical and modern, is presented below.

2. Sexual development is best considered along a minimum of five levels. All five are biased in their manifestation by the aforementioned organizing factors. These levels are remembered by the acronym PRIMO (Diamond, 2000a, 2000b). These levels are:

   > *P*= gender Patterns: How an individual behaves in comparison or in contrast with others in the society and culture; is it in keeping with or at variance with those behaviors considered socially appropriately masculine, feminine, or other?[1]
   > *R* = Reproductive considerations: What are the person's reproductive capabilities, aspirations and actualities? Does the individual aspire to live or actually live as a mother or father?
   > *I* = Identity: How the person views self in regard to sex and gender. Does the individual recognize self as male or female and does the individual prefer life as a man or as a woman? Are sexual identity and gender identity concordant or not?

   Currently, sex and gender are best recognized as terms that reflect different aspects of life related to sexuality. The term sex is best associated with the anatomy of genitals, chromosomes or other biological characteristic while *gender* refers best to an imposed or adopted social and psychological condition. This would be in behaviors and attitudes a particular society promotes for its individuals. *Sexual identity* refers to how a person views him or herself as a biological male or female. This inner conviction usually mirrors one's outward physical appearance and is in concert with the typically sex-linked role one develops and prefers or society attempts to impose. *Gender Identity*, regardless of the individual's actual biological sex, refers to how the individual prefers to see self as functioning in society, either as a man or woman. Under this concept of gender the terms *man* and *woman* are social terms analogous to *father* and *mother* regardless if the

role or position is occupied by an anatomical male or female (Diamond, 2002a). Masculine and feminine, as adjectives, can refer to either sex or gender characteristics.

> *M* = Mechanisms: These are the abilities to experience and perform typical and expected features of sex; e.g., ejaculate, nurse, vaginally lubricate, become erotically aroused, orgasm, etc.
> *O* = Sexual Orientation: The type of sexual, erotic or romantic partner toward whom one is attracted. Commonly this is thought of in terms of *heterosexual*, *homosexual* or *bisexual*.

Years ago Karlen and I (Diamond & Karlen, 1980) suggested that terms such as heterosexual or homosexual be used as adjectives instead of nouns identifying people. I have since recommended that the terms *androphilic* (male loving), *gynecophilic* (female loving) and *ambiphilic* (both loving) be used as descriptors (Diamond, 2002a). The first mentioned terms are often confusing when Intersexed or transsexual persons are described and it is not always clear if one is referring to the individual's original or final state. Also, the suggested terms can be used as adjectives without consideration of the original sex or gender of the person spoken of. The suggested terms also are not saddled with the taboo or political features of the hetero/homo/bi-sexual nomenclature and, again unlike the former terms, are not assumed to be a total description of anyone.[2]

3. The family, society, culture, and physical environment in which the infant finds himself or herself exerts a shaping influence on sexual and other aspects of development. These continue throughout life. It is thus, starting out with influences—biases or predispositions—imposed starting from conception that the child meets the world and interacts (Diamond, 1976, 1979, 2002a). It is thus not nature *or* nurture but nature *and* nurture working together that structure psychosexual development.

4. Starting very early in life the developing child, consciously or not, begins to compare himself or herself with others; peers and adults seen, met, or heard of. All children have this in common (R. Goldman & J. Goldman, 1982). In so doing they analyze inner feelings and behavior preferences in comparison with those of their peers and adults. In this analysis they crucially consider "Who am I like and who am I unlike?" Role models are of particularly strong influence but there is no way to predict if a model will be chosen, who will be chosen, nor on what basis chosen. In this comparison there is no internal template of male or female into which the child attempts to fit. Instead they see if they are *same* or *different* in comparisons with

peers, important persons, groups or categories of others (Diamond, 2002b). It is the "goodness of fit" that is crucial. The typical boy, even if he is effeminate, sees himself as fitting the category "boy" and "male" and eventually growing to be a man with all the accoutrements of masculinity that go with it. Similarly the typical girl, even if quite masculine, grows to aspire being a woman and probably being a mother. The comparisons allow for great flexibility in cultural variation in regard to gendered behaviors. It is the adaptive value of this inherent nature of brain development that trumps a concept of a male–female brain template to organize gender development. The average male fits in without difficulty, the atypical one who will exhibit signs of gender identity dysphoria, for instance, does not see himself as *same* or similar to others of his gender. He sees himself as *different* in likes and dislikes, preferences and attitudes but basically in terms of identity. There will be a period of confusion during which the child thinks something like *Mommy and Daddy call me boy, and yet I am not at all like any of the others that I know who are called "boy."* While the only other category the child knows is *girl*, he develops the thought that he might be or should be one of those. Initially that thought is too great a concept leap to be easily accepted and the child struggles in an attempt to reconcile these awkward feelings. The boy might actually imagine he is, if not really a boy than possibly an *it*, an alien of some sort or a freak of nature. Eventually he might come to believe, since he knows of no other options, that he *is* a girl or should be one. And with a child's way of believing in Santa Claus or the Tooth Fairy he can come to expect he will grow up to be a woman. With experience and the realization that this won't happen of its own accord the maturing child may begin to seek ways to effect the desired change. A female can experience an opposite scenario.

5. The more permissive the culture, the more likely is the growing person to express fewer socially accepted gender behaviors and attitudes. Conversely, the more restrictive the culture the less likely is the individual to express his or her core feelings as to gender especially if they go against the majority (Diamond, 2002a, 2002b).

Evidence for the Organizing Effects of Genetics and Androgens

The early evidence that behavior is psychosexually biased comes from natural and experimental animal findings. It has been known since antiquity in many species of animals that even those raised in isolation will display sexually distinct male and female typical behaviors when placed in social situations. It has also been known that neonatal castration, removal of the androgen–testosterone-

producing testes of farm animals and males of other species, produces fauna that are relatively tranquil and submissive in general and not like typical male conspecifics. Castration will almost always keep males from copulating or engaging in fights for dominance or participating in other masculine behaviors. Dependent on the species this demasculinization simultaneously induces an increased feminization and exposure of a female fetus to androgen, in an opposite mode, can have both a masculinization and defeminization effect on behavior (Beach, 1976a). For instance castrated males are more likely than intact males to allow themselves to be sexually mounted and females given androgens will uncharacteristically mount males or other females. Dependent on the species these behavioral effects can be reversed by the administration or removal of endogenous testosterone showing the crucial behavior mediating potential of androgens.

The classic experimental research on the influence of testosterone was done by Phoenix, Goy, Gerall, and Young (1959). This work showed that the administration of testosterone to pregnant female guinea pigs resulted in female offspring that, without further manipulation, would act like males in their adult behaviors. Dependent upon the amount and duration of testosterone administered the genitals might or might not be masculinized. But the behavioral effects could be demonstrated even if the female's genitals were not virilized. The work of Goy, Bercovitch, and McBrair (1988) showed this occurred in primates as well; the behaviors of the female monkeys exposed to prenatal testosterone were masculinized even when no external signs of the treatment was evident. The work of Gorski (1991) showed similarly that when female rats were given a single injection of testosterone following birth, they too showed male-typical sexual behavior as adults. Analogously, male rats or monkeys castrated following birth showed female-typical sexual behavior as adults. Basically the nervous system has become sexually differentiated (Breedlove, 1994; Kimura, 1992).

A particularly significant research study was performed by Short (1979) with the Red deer (*Cervus elaphus*). In this large mammal stags and hinds live apart for most of the year. During the rutting season, however, a stag will gather a harem of hinds with which he will mate. Short castrated male calves within a week of birth and followed their development in the wild.[3] Castration in deer prevents the development of any male secondary physical sexual characteristics such as antlers or neck mane. This resulted in the castrated males looking like hinds and being accepted into the harem as such by the controlling stag and group females. Such males were not driven out of the harem in the way that an intact male animal would have been. Significantly, however, these castrated males, seemingly considered as female by all the other animals with which they were in contact, attempted to copulate as males and showed typical flehmen and mounting. To quote Short "surely a most dramatic example of the long-lasting

imprinting effect of male sex hormones on the brain during fetal life, an effect that can persist into adulthood in the absence of the hormone" (Short, 1979, p. 371). Even though all the other deer treated the castrated males as females, these stags "knew" they were males, or at least acted as ones when it came to their copulatory behaviors.

The aforementioned studies have shown that mammals are significantly shaped (biased) in their sexual behavior by pre- or neo-natal androgen effects and that even females will display male-typical sexual behaviors when exposed to comparable testosterone administration. And, depending upon the species, males deprived of this early testosterone will, when adult, display typical female behaviors (Beach, 1976b). It has also been shown in many animal studies that genetics induce sexual differences in different behaviors. Standard animal breeding practices take advantage of this. Animal studies have clearly shown different copulatory behaviors induced by breeding for many species of animals, particularly for dogs, mice, rats, sheep and guinea pigs. Some of the best known breeding experiments have shown sheep that demonstrate in-bred homosexual or heterosexual activities (Perkins & Fitzgerald, 1992). Thus, due to natural endocrine and genetic factors, individual animals are not psychosexually neutral at birth but programmed to behave in certain sex-specific ways. And it seems reasonable— because sexual and reproductive features are crucial for perpetuation of the species—that humans would follow this evolutionary mammalian heritage (Diamond, 1965).

The evidence from humans is compelling. It comes largely from clinical data and experiments of nature. It is evident that behaviors occur counter to expectations if judged from how individuals are reared and educated socially and formally. Transsexuals, for example, demonstrate the widely seen clinical experience of individuals coming to express a gender identity at odds with their apparent anatomy and upbringing. Transsexuals are individuals of either male or female sex that persistently believe they are or should be of the opposite sex (DSM-IV-TR, American Psychiatric Association, 2000). Despite being brought up, nurtured and schooled in conformity with their gonads and genitals, persons with this condition, sometimes called GID (Gender Identity Dysphoria), nevertheless, live as members of their believed gender and most eventually undergo extensive surgery to accomplish conforming sexual and gender appearances. One of the most common findings among transsexuals is that quite early in life they began to feel different from others they were supposed to be like; this often while still a toddler or a preschooler. Here are some sample expressions: "I have known since as early as I can remember that I wasn't really a boy"; "I have known I am TS [transsexual] since I was 6 years old"; "I felt different from my earliest memories"; and "I knew as a child that I was female but spent half a century in denial." These individuals relate they knew they were

different by comparing themselves with others (Diamond, Watson, Miyamoto, & Fee, 2006).[4]

There now is an extensive review of transsexual development that documents its biological underpinning (GIRES, 2006). Among the most compelling findings are that actual brain components of transsexuals are more like those whose gender they share than whose genitals they share (Kruijver et al., 2000; Zhou, Hofman, Gooren, & Swaab, 1995).[5] These brain components are presumably involved in the organization of gender identity. Studies of transsexual twins are also instructive. If one member of a set of identical male twins transitions to live as a female the chance of his brother doing similarly is approximately 50% and identical twins reared apart have been found to both transition. Among fraternal male twins, the likelihood of the brother also transitioning is only about 15%. For sets of female twins the comparable statistics are on the order of 20 and 0%, respectively (Diamond & Hawk, 2004). And a study of sex-steroid related genes in male-to-female transsexuals found statistically significant gene arrays that differed from non-transsexuals (Henningsson et al., 2005). From these findings and the fact that male-to-female transition is about three times the frequency of female-to-male transition it is assumed the forces leading to such changes are of genetic origin and significantly different in males and females.

Intersexed individuals—persons with identifiable characteristics of both male and female anatomy—are also instructive here. Many such individuals, despite being brought up as typical boys and girls, see themselves as members of the opposite sex and switch their gender status. The likelihood of such switches differs depending upon the specific Intersex condition and its gender confirming or societal vulnerable characteristics (see e.g., Cohen-Kettenis, 2005; Diamond, 1997a; Diamond & Watson, 2004; Meyer-Bahlburg, 2005; Reiner, 2005).

Particularly dramatic evidence for an inborn psychosexual gender identity bias comes from the work of William Reiner. This physician has had extensive experience caring for individuals with a condition called cloacal exstrophy. Persons with this condition are born basically without genitalia and a pelvic cloaca-like opening where the genitals should be (Reiner, 2004). Males with this condition are not intersexed and develop typically in all but their pelvic region. These males experienced a male-typical prenatal androgen exposure (Mathews, Perlman, Marsh, & Gearhart, 1999) and genetic heritage (Mayer, Lahr, Swaab, Pilgrim, & Reisert, 1998). Since the penis in these males is seriously inadequate or absent the usual clinical procedure had been to assign these infants as girls socially, legally, and surgically through bilateral castration and feminizing genitoplasty. They were then raised as typical girls with the parents aware, and sometimes unaware (Diamond, 1999; Reiner, 2004), of the child's birth sex.

Following up a clinical population of such individuals Reiner found that of 24 subjects raised as girls, 13 declared themselves male, seven have declared themselves female, two have persistently refused to declare a gender identity, one although only 7 years old has repeatedly expressed a male living preference and one has died (Reiner, 2004). Thus 60% of these female-reared individuals, nevertheless, on their own without a penis or knowing their history, came to identify as males. Apparently a male bias—testosterone priming in utero—outweighed the female upbringing, education, and gender indoctrination of these children's lives. In trying to understand why all did not change we can only repeat that there is a great deal of individual response to the interaction of nature and nurture.[6]

Any discussion of human evidence for psychosexual bias would not be complete without consideration of the work of behavioral geneticists such as Thomas Bouchard, N.G. Martin, Robert Plomin, Nancy Segal, and others (e.g., Bouchard, Lykken, McGue, Segal, & Tellegen, 1990; Martin, 1978; Plomin, 1990; Plomin & Asbury, 2005; Segal, 2000). Using data from studies of twins reared together or apart and families with unique characteristics (see e.g., Blanchard, Cantor, Bogaert, Breedlove, & Ellis, 2006), they have demonstrated the power of nature to organize and bias behaviors of all sorts. But, as proposed in the introductory remarks, these factors interact with forces of nurture. The "how" or result of this interaction is a melding of the natural genetic and endocrine forces within the individual to bias behavior, e.g., make it more likely than not that certain behavioral choices are more likely to occur.[7]

The Classic Case of Male Development

The well-known case of David Reimer, I originally identified pseudonymously as both "John" and then "Joan" in the John/Joan twin case (Colapinto, 2000; Diamond & Sigmundson, 1997a) as well as the experience and expressions of others will be used to illustrate how the above features allow us to analyze masculine development. This example demonstrates the process of masculine development a typical male undergoes in an unconscious way. The average male or female, while they might do so in retrospect, does not usually analyze how they develop. They just accept what occurs as natural and inevitable. It is only with reflection that they can imagine the processes through which they've passed. Persons like David, transsexuals and others who see themselves as different, however, do give a good bit of thought to this development whether the analysis is of patterns, identity, object choice or other aspects of PRIMO.[8]

David Reimer's concept of masculinity was not based on the presence of a penis; he had none. An extreme circumcision accident left him without a phallus.

His anguished parents sought help as to how to deal with this traumatic situation. They were advised that without a penis David could not develop as a male. It was thus recommended that he be transformed into a female. To this end David had feminizing surgery to remove his scrotum and testes, had his perineum surgically made to appear like a vulva, and when he got older prepared to have a vagina constructed. Most crucially his parents were instructed to raise David as a girl in the belief that growing up as one would solidify his identity (Diamond & Sigmundson, 1997a). His parents renamed him Brenda and then did the best they could to follow this advice (Colapinto, 2000).

Despite being raised as a girl, infused with estrogens, and given psychiatric counseling and therapy to inculcate and reinforce feminine ways and attitudes, David refused to see himself as a girl and, at the age of 14, threatened suicide unless he could live as a male. It was only then that he was informed of his history. His response was immediate relief in knowing that his sense of not being a girl was not the result of some sort of bazaar thinking or insanity. When asked how he knew he should be a boy instead of the girl he was raised he said it was based on basic inner feelings. Early on he recognized his disposition to do typical boy's things and his dislike and even aversion for engaging in things he knew to be typical girl's things. He saw that his feelings and way of thinking seemed to be the same of those as people he knew of as boys and different from those he knew of as girls. He was bright but unschooled and his thinking was intuitive and used the vocabulary, symbolism, and understanding he possessed. David basically came to realize his rearing and life as a girl was wrong by comparing his own behavior preferences and feelings with those of other boys and girls he knew and saw in the world around him. And, despite being raised as a girl, he felt so extremely different from those others he knew as girls, and felt more like those he knew of as boys, he came to realize that since he wasn't a new type of creature, he would more comfortably live like a male. Despite being reared as a girl, given medical and psychiatric attention reinforcing femininity, and being punished at school and elsewhere when he blatantly demonstrated male-like and "ungirl"-like behavior, David came to identify as a boy. This was manifest in many ways.

While still quite young David insisted on standing while urinating so much that the girls in school refused to let "Joan" into their toilet. His natural ways of behaving seemed masculine to others as well. His schoolmates came to ridicule Joan by calling her cave-man, cave-woman, or gorilla and using similar taunts (Diamond & Sigmundson, 1997a). Due to her obviously unusual girl behavior Joan was unable to make friends and was quite lonely. David recalled having dreams in which he was a "stud" with a car in which to pick up girls. These were the grist of his thought and comparisons. This type of comparative analysis—am I same or am I different?, who am I like and not like?—is not obtuse, difficult to understand, nor far-fetched. It is the same basic type of analysis and

understanding that develops between or among everyone whether they are transsexuals, Intersexed, gay, queer, bi, or straight, and tells them to which group they feel most identified and with which groups they feel least associated. These feelings and impressions usually start at a very young age and typically come into focus during puberty.

All these persons from groups that are different have in common that they come to realize they are not typical in critical aspects of their gender patterns, orientation or physical aspirations. In contrast, the average boy or girl accepts and doesn't question that they are like the majority of others of their own gender. They feel they are same and that is reassuring to them. Those that consider themselves different, however, like David, give this analysis much more thought, and the thinking is generally anguished.

Everyone, consciously or unconsciously, makes a *same–different* and *like-and-not-like* analysis. Afterwards the majority of persons, without much thought, stay as they are and spontaneously or with effort increase their group association as they mature. Many males will aspire to emulate different male role models from John Wayne to Alan Alda. As they mature there will be a majority of persons that follow a trajectory leading to macho stereotypes and others that will travel a less virile path. Along the way, many males self-test to gauge if they are man-enough for whatever goal they have in mind (Diamond, 1997b).[9]

Among these "self-testers" many will feel they have to "come out" and admit, at least to themselves and occasionally to others, that they are different in one or more aspects of PRIMO. In terms of gender the most extreme manifestation of "coming out" differently is by switching to live as the "opposite" sex. Many others will find their own way of mixing and melding gender characteristics in ways that have come to be known as expressions of Transgenderism, gender-queer, and so forth.[10] A subgroup of individuals, of unknown size, while feeling aspects of being transgendered, nevertheless remain secretive about their feelings and desire for expression and consider the admission too high an emotional, financial, or social cost (Diamond et al., 2006).

Individuals in their personal analysis, like David, use thoughts and comparisons in a common and intuitive way to tell them with whom they are same and with whom they are different. And most tellingly the process informs them if it is more fitting and suitable and appropriate to live as a boy or girl, man or woman, straight, gay, Intersexed, MSM or whatever.[11] The template used is not one of male or female but of *same or different, like and unlike*, and better or worse (Diamond, 2002a, 2002b).

It should also be stated that as one learns what it is to be a boy and

appropriate as such, one also learns what is inappropriate and one learns what it is to be a girl. In this way males determine if femininity suits them. In our society, however, a male that exhibits feminine behaviors sufficient to be considered a sissy is much less tolerated than a female tomboy and there is a social price to pay for effeminate demonstrations. There can be bodily consequences as well as social ones; many boys are forced to physically fight their peers to defend themselves against taunts and prejudice.[12]

The final behavioral and attitudinal sexual profile that any adult develops and manifests is a composite of all the preceding. As a last and separate issue, ethically I believe that individuals ought be allowed to follow their own dispositions as to sexual expression as long as it does no injury to others. Further I think that no one has the right or privilege to impose his or her preference or will as to what is correct as to another's gender or sexual expression (Diamond & Beh, 2006).

I have tried to be clear and explicit in how I view the development and adoption of gendered behaviors. To add further clarity I will now mention the mistaken and wrong thinking of one culture and one writer as examples of mischaracterization and misunderstanding of my theory. This lack of scholarship might be induced by a political motive, as in the first case, or an emotional reluctance to consider a biological underpinning to human behaviors as in the second.

Misunderstanding and Clarification

Currently in Japan my publication of the John/Joan story (Diamond & Sigmundson, 1997a) and the consequent Colapinto (2000) book are mistakenly taken as proof of an inherent and fixed Japanese masculinity in biologic males that will emerge regardless of rearing or environment. This thinking is being used by so-called Japanese Traditionalists in arguments against the so-called Japanese Feminists in political battles that attempt to influence Japan's cultural gender stereotypes. At the request of Japanese journalists and others, to clarify my position on this matter, I wrote an article (Diamond, 2005) expanding on my belief that development will be a combination of nature and nurture and that relaxation of most gender biased activities in Japan will probably enhance the society. But, in any case, every individual should have the opportunity to express any legal gendered behavior unhindered by past social restrictions.

There is misunderstanding closer to home. The recent book *Undoing Gender* by Butler (2004) contains a chapter modeled after an article published previously (Butler, 2001). In both the book and journal article she had many comments about my work, its theoretical underpinnings and some of the repercussions from

it that indicated a lack of understanding or willful distortion. Unfortunately, she also muddled David Reimer's words and thinking.

Butler took my work, in particular the John/Joan case, as a focal point to discuss gender development. She then expanded her mistaken thinking to the greater tragedy associated with the medical model of treatment it fostered for cases of persons born with ambiguous genitalia. David's development, while a tragedy, was presented to the world as a successful transformation of a male to a developing woman (Money, 1975; Money & Ehrhardt, 1972). This led physicians to take infant surgery and sex reassignment as a model for dealing with infants, mostly males, born with ambiguous genitalia; they were to be raised as females. Females born with masculine looking genitalia routinely had their clitoris surgically reduced in size to look like a more typical female (Diamond, 1999, 2004).

Butler wrote "Milton Diamond, a sex researcher who believes in the hormonal basis of gender identity who has been battling Money for several years" (Butler, 2001, p. 623). No citation for my work was given. I have never said anything like it and have never considered my theory one of a hormonal basis for gender identity. Since 1965 I have said that one's identity is the result of an interaction of biological and social forces: "behavior is a composite of prenatal and postnatal influences with the postnatal factors superimposed on a definite inherent sexuality" (Diamond, 1965, p169). I do believe that hormones have an important influence but, to alert researchers that hormones are not the be-all and end-all leading to sexual or gender identity, colleagues and I (Diamond et al., 1996) published a paper entitled "From fertilization to adult sexual behavior: Nonhormonal influences on sexual behavior." And the only professional arguments I have had with John Money are with his theoretical approach to sexual development (e.g., Diamond, 2000a).

On page 62 of the Butler book (page 625 of the article), she stated "David experienced a deep sense of gender that is linked to his original set of genitals,... which no amount of socialization could reverse. This is the view of Colapinto and of Milton Diamond as well" (Butler, 2004, p. 62). Again no citation for my work was given. Her attribution that we think David's identity emanated from his remembrance of a penis is ludicrous. David was an infant when he lost his penis and he had never made any statement of having any memory of having one. Butler makes other mistaken references to the value of a penis—even a missing one—to inculcate masculinity. This is wrong. Indeed, over the years I have presented more than a few cases where individuals with either transsexual or Intersex conditions changed gender due to all sorts of forces or despite other pressures, and certainly independent of genitals (e.g., Diamond, 1996, 1997a, 1999; Diamond & Watson, 2004). In my theory, the possession of or appearance

of one's genitals have little to do with acceptance or rejection of gender and the theory holds that genitals are not needed for a sexual or gender identity to develop (Diamond, 1997a, 1997b, 1999; Diamond & Sigmundson, 1997b). These findings are independent of one's sex being male or female or a person seeing himself or herself as gay, bi, straight or whatever. John/Joan, as do female-to-male transsexuals, obviously saw himself as male despite the absence of a penis. A female who lost her breasts or uterus due to surgery, for instance, usually still identifies and sees herself as a woman. The most important sex organ is not between one's legs but between one's ears. It is the brain (Beh & Diamond, 2000) and this is molded pre- and post-natally.[13]

One of the most obvious and egregious of Butler's errors was the statement "Diamond argued, for instance, that Intersexed infants, that is, those born with mixed or indeterminate gender attributes, generally have a Y chromosome, and that possession of the Y is an adequate basis for concluding that they ought to be raised as boys" (Butler, 2004, p. 625). In the book she asserted that I believed "the presence of the Y is sufficient grounds for the presumption of social masculinity" (Butler, 2004, p. 63). In our original suggestions for the management of Intersexed children we said, and have consistently repeated, "declare sex based on the most likely outcome for the child involved" (Diamond & Sigmundson, 1997b, p. 1047). And later, in the same article we wrote: "Rear as female XY persons with AIS Androgen Insensitivity Syndrome (grades 4–7)... and XY persons with gonadal dysgenesis" (Diamond & Sigmundson, 1997b, p. 1047). These recommendations were made due to experience, which showed that such assignments would lead, not inevitably, but often, to acceptance of and satisfaction with the assignment. These also reflect the feature of *brain sex*.[14]

In a recent paper (Diamond & Watson, 2004), originally reported on in 2000 (Diamond & Watson, 2000), we wrote of persons with AIS (all having a Y chromosome) with some individuals shifting from living as men to living as women and vice versa with others shifting from life as women to living as men. And I have been consistent in defending the rights of those with a Y chromosome to shift to live as women and for those with XX chromosomes—the typical female—to live as men if that is their wish (Beh & Diamond, 2000, 2005a; Diamond, 1999; Diamond & Beh, 2006).

Most troubling is Butler's false assertion that I support surgery on intersexed infants (pages 63–65 of her book; pages 625–627 of her article). I, along with my colleague Kenneth Kipnis *were the first anywhere* to professionally argue that, for medical, scientific and ethical reasons, all such surgeries be stopped since there is no way for the physicians to know how the child would want to live. We strongly recommended "that there be a general moratorium on such surgery when it is done without the consent of the patient" (Kipnis & Diamond, 1998, p.

405, 1999, p. 186). That original call was repeated at an invited presentation to the American Academy of Pediatrics (Diamond, 1999). Moreover, this stance against infant surgery has been strengthened with similar arguments in law and ethics publications (Beh & Diamond, 2000, 2005b; Diamond & Beh, 2006; Kipnis & Diamond, 1999). This argument is in keeping with the theory that allows each individual to develop uniquely. My aim has consistently been to encourage parents to love and protect the child they have regardless of the gender path followed by the youngster (Beh & Diamond, 2000, 2005b).

In an early paper Sigmundson and I argued against cosmetic infant genital surgery and stressed that "In rearing, parents must be consistent in seeing their child as either a boy or girl; not neuter" (Diamond & Sigmundson, 1997b, p. 1047). In our society Intersex is a designation of medical fact but not yet a commonly accepted social designation. With age and experience, however, an increasing number of hermaphroditic and pseudohermaphroditic persons have adopted Intersex identification (Schober, 2001). In any case, we advise parents to allow their children free expression as to choices in toy selection, game preference, friend association, future aspirations, and so forth. Legal scholar Hazel Beh and I have written why we think it is not even reasonable to allow parents to permit such cosmetic surgery on their children (Beh & Diamond, 2005b). Our belief is that the child must be free to express his or her own will unrestricted by imposed cosmetic surgery that can be obtained later if desired.

Butler (2004) credited Cheryl Chase and Anne Fausto-Sterling with arguing against infant surgery and inferred that I advocate surgery. Butler may have written as she does because of her mistaken belief that I think people have to follow one particular developmental path or another. Regardless, both Chase and Fausto-Sterling have themselves written that I argue against surgery (Fausto-Sterling, 2000; ISNA, 1997). Indeed, in 1998 I invited Chase to my presentation to the American Academy of Pediatrics where I recommended that physicians impose a moratorium on such procedures. I used that occasion to introduce Ms. Chase to physicians so they would, for the first time, begin to listen to the perspective of Intersexed persons and hear their complaints (Diamond, 2004). The year previously she and other intersexed individuals had picketed outside a professional physician's conference in Boston after they had been refused admission and had been studiously ignored (http://www.isna.org/books/chrysalislbeck).

Another mistake of Butler's was her assertion (journal page 627) that "despite Diamond's recommendations, the Intersexed movement has been galvanized by the John/Joan case; it is able now to bring to public attention the brutality and coerciveness and lasting harm of the unwanted surgeries performed on Intersexed infants." It is not *despite* my assertions; it is *because* of my assertions

(Diamond, 1999; Kipnis & Diamond, 1998, 1999; NOVA, 2001). I presented the John/Joan case to medical specialists in 1998 when addressing my concerns to the American Academy of Pediatrics (AAP). During that talk I introduced the topic of potential and real harm done by infant surgery, sex reassignments and castration without foreknowledge of the outcome (Diamond, 1999). My rationale was that if sexual reassignment with enforced femininity did not work for David, although reinforced by surgery, hormones, parental rearing and psychiatry, why should they think it would automatically work on Intersexed children?[15] In the United States my talk resulted in issuance by the AAP of new guidelines for the management of Intersexed children (AAP, 2000; Zderic, Canning, Carr, & Snyder, 2002) and my address to the British Association of Paediatric Surgeons in 1999 similarly prompted their issuance of new treatment guidelines that proposed a more restrictive view against infant surgery in Britain (Rangecroft, 2003; Rangecroft et al., 2001).

Lastly, Butler seriously misread or misinterpreted David Reimer's way of thinking and how "John" developed the understanding that his being reared as a girl was "incorrect." Rather than giving value to David's intuition, instinct, personal impressions and ability to sense similarities and differences as well as have feelings of right and wrong fit or "gut" impressions, Butler preferred to think his and other people's gender development stemmed in general from forces of politics and indoctrination. For this she (journal page 621), as Foucault (1980), provided no evidence but only claimed to support their belief that such are the factors responsible for gender acceptance, modification, or rejection. Indeed, politics and indoctrination do take their toll, as do strong pressures and forces of religion, parenting and education. However, all these forces mesh with one's internal drives, inclinations, and impulses to produce the person that emerges. The cost in developmental terms is the time and effort, both emotionally and physically, needed for the individual to come to some sort of life decision and evolve a way of being. As do all males unconsciously, in a way strongly analogous to that of female-to-male transsexuals, David was dramatically responding to internal cues in response to the world he saw around him.

Hopefully the theory presentation and evidence in support of it, and critical analysis of a culture's and one particular author's mistakes, has clarified the Biased-Interaction Theory of Psychosexual Development and has given credit to each individual's analytic abilities to tell *same* from *different* and thereby know if they should be a boy or girl, a man or woman.

Acknowledgement: Support for this work has come from the Eugene Garfield Foundation of Philadelphia, Pennsylvania.

REFERENCES

AAP: American Academy of Pediatrics (2000). Evaluation of the newborn with developmental anomalies of the external genitalia. Pediatrics, 106, 138–142.

Alex, R. (2004). Re Alex. 180 Family Law Review (Australia), 89, 92.

American Psychiatric Association (2000). Diagnostic and statistical manual of mental disorders (4th ed.). Washington, DC: American Psychiatric Association (text revision).

Beach, F. A. (1976a). Hormonal control of sex-related behavior. In F. A. Beach (Ed.), Human sexuality in four perspectives (pp. 247– 268). Baltimore, MD: The Johns Hopkins University Press.

Beach, F. A. (1976b). Cross-species comparisons and the human heritage. In F. A. Beach (Ed.), Human sexuality in four perspectives (pp. 296–317). Baltimore, MD: The Johns Hopkins University Press.

Beh, H. G., & Diamond, M. (2000). An emerging ethical and medical dilemma: Should physicians perform sex assignment surgery on infants with ambiguous genitalia? Michigan Journal of Gender and Law, 7, 1–63.

Beh, H. G., & Diamond, M. (2005a). Transsexualism in Australian family court and its relativity to the United States. Health Matrix: Journal of Law–Medicine, 15, 239–283.

Beh, H. G., & Diamond, M. (2005b). David Reimer's legacy: Limiting parental discretion. Cardozo Journal of Law and Gender, 12, 5–30.

Bem, D. J. (1995). Exotic becomes erotic: A developmental theory of sexual orientation. Psychological Review, 103, 1–16.

Blanchard, R., Cantor, J. M., Bogaert, A. F., Breedlove, S. M., & Ellis, L. (2006). Interaction of fraternal birth order and handedness in the development of male homosexuality. Hormones and Behavior, 49, 405–414.

Bouchard, T. J., Lykken, D. T., McGue, M., Segal, N. L., & Tellegen, A. (1990). Sources of human psychological differences: The Minnesota study of twins reared apart. Science, 250, 223–228.

Breedlove, S. M. (1994). Sexual differentiation of the human nervous system. Annual Review of Psychology, 45, 389–418.

Butler, J. (2001). Doing justice to someone. GLQ: A Journal of Lesbian and Gay Studies, 7, 621–636.

Butler, J. (2004). Undoing gender. Oxford: Routledge.

CDC (2002). Sexual behavior selected health measures: Men and women 15–44 years of age. Hyattsville, MD: CDC: National Center for Health Statistics.

Cohen-Kettenis, P. T. (2005). Gender change in 46,XY persons with 5-a-reductase-2 deficiency and 17B-hydroxysteroid dehydrogenase-3 deficiency. Archives of Sexual Behavior, 34, 399–410.

Cohen-Kettenis, P. T., & Pfäfflin, F. (2003). Transgenderism and intersexuality in childhood and adolescence: Making choices. London: Sage.

Colapinto, J. (2000). As nature made him: The boy who was raised as a girl. New York, NY: Harper Collings.

Diamond, M. (1965). A critical evaluation of the ontogeny of human sexual behavior. Quarterly Review of Biology, 40, 147–175.

Diamond, M. (1976). Human sexual development: Biological foundation for social development. In F. A. Beach (Ed.), Human sexuality in four perspectives (pp. 22–61). Baltimore, MD: The John Hopkins University Press.

Diamond, M. (1979). Sexual identity and sex roles. In V. Bullough (Ed.), The frontiers of sex research (pp. 33–56). Buffalo, NY: Prometheus.

Diamond, M. (1993). Some genetic considerations in the development of sexual orientation. In M. Haug, R. E. Whalen, C. Aron, & K. L. Olsen (Eds.), The development of sex differences and similarities in behaviour, vol. 73, NATO ASI Series (pp. 291– 309). Dordrecht: Kluwer.

Diamond, M. (1995). Biological aspects of sexual orientation and identity. In L. Diamant & R. McAnulty (Eds.), The psychology of sexual orientation, behavior and identity: A handbook (pp. 45– 80). Westport, CT: Greenwood.

Diamond, M. (1996). Self-testing among transsexuals: A check on sexual identity. Journal of Psychology & Human Sexuality, 8, 61–82.

Diamond, M. (1997a). Sexual identity and sexual orientation in children with traumatized or ambiguous genitalia. Journal of Sex Research, 34, 199–222.

Diamond, M. (1997b). Self-testing: A check on sexual identity and other levels of sexuality. In B. Bullough, V. L. Bullough, & J. Elias (Eds.), Gender blending (pp. 103–125). Amhearst, NY: Prometheus.

Diamond, M. (1999). Pediatric management of ambiguous and traumatized

genitalia. The Journal of Urology, 162, 1021–1028.

Diamond, M. (2000a). The Joan/Joan case : Another perspective, the Position. <http://www.hawaii.edu/PCSS/biblio/articles/intersex/2000-another-perspective.html>.

Diamond, M. (2000b). Componentes basicos de la sexualidad humana (PRIMO: Basic components). Psicoterapia. (Spanish Psychology Journal), X, 23–40.

Diamond, M. (2002a). Sex and gender are different: Sexual identity and gender identity are different. Clinical Child Psychology and Psychiatry, 7, 320–334.

Diamond, M. (2002b). Conversation with Milton Diamond: Interview—Transsexuality and intersexuality. In B. D. Katula & W. E. Parker (Eds.), In the realm of the Phallus Palace (pp. 35–56). Los Angeles, CA: Alyson.

Diamond, M. (2004). Sex, gender, and identity over the years: A changing perspective. In M. Diamond & A. Yates (Eds.), Child and adolescent psychiatric clinics of North America: Sex & gender (vol. 13, pp. 591–607). Philadelphia, PA: Elsevier.

Diamond, M. (2005). Traditionalist vs. feminists in contemporary Japanese culture: Nature vs. nurture vs. interaction and social implications. JASE (Japanese Association of Sex Educators), 24, 1–5.

Diamond, M., & Beh, H. G. (2006). The right to be wrong: Sex and gender decisions. In S. Sytsma (Ed.), Ethics and intersex (pp. 103–113). Berlin Heidelberg New York: Springer.

Diamond, M., Binstock, T., & Kohl, J. V. (1996). From fertilization to adult sexual behavior: Nonhormonal influences on sexual behavior. Hormones and Behavior, 30, 333–353.

Diamond, M., & Hawk, S. T. (2004). Concordance for gender identity among monozygotic and dizygotic twin pairs. Paper presented at the annual meeting of the American Psychological Association, Honolulu, HI (August).

Diamond, M., & Karlen, A. (1980). Sexual decisions. Boston, MA: Little Brown.

Diamond, M., & Sigmundson, H. K. (1997a). Sex reassignment at birth: Long term review and clinical implications. Archives of Pediatrics and Adolescent Medicine, 151, 298–304.

Diamond, M., & Sigmundson, H. K. (1997b). Management of intersexuality: Guidelines for dealing with persons with ambiguous genitalia. Archives of

Pediatrics and Adolescent Medicine, 151, 1046–1050.

Diamond, M., & Watson, L. A. (2000). Identity, orientation and gender-typical behaviors in individuals with androgen insensitivity syndrome. Paper presented at the Second International Behavioral Development Symposium, Minot, North Dakota.

Diamond, M., & Watson, L. A. (2004). Androgen insensitivity syndrome and Klinefelter's syndrome. Child and Adolescent Psychiatric Clinics: Sex and Gender, 13, 623–640.

Diamond, M., Watson, L. A., Miyamoto, H., & Fee, J. (2006). Gender Identity; Why I did or did not change: Passing and body configuration (in preparation).

Fausto-Sterling, A. (2000). Sexing the body: Gender politics and the construction of sexuality. New York: Basic Books.

Foucault, M. (1980). The history of sexuality: An introduction. New York: Viking (US edition).

GIRES et al. (2006). Atypical gender development—A review. International Journal of Transgenderism, (in press).

Goldman, R., & Goldman, J. (1982). Children's sexual thinking: A comparative study of children aged 5 to 15 years in Australia, North America, Britain, and Sweden. London: Routledge & Kegan Paul.

Gorski, R. (1991). Sexual differentiation of the endocrine brain and its control. In M. Motta (Ed.), Brain endocrinology: Comprehensive endocrinology (pp. 71–104). New York: Raven.

Goy, R. W., Bercovitch, F. B., & McBrair, M. C. (1988). Behavioral masculinization is independent of genital masculinization in prenatally androgenized female rhesus macaques. Hormones and Behavior, 22, 552–571.

Green, J. (2004). Becoming a visible man. Nashville: Vanderbilt University Press.

Harris, J. R. (1998). The nurture assumption: Why children turn out the way they do. New York: Free Press.

Henningsson, S., Westberg, L., Nilsson, S., Lundstrom, B., Ekselius, L., Bodlund, O., et al. (2005). Sex steroid-related genes and male-to-female transsexualism. Psychoneuroendocrinology, 30, 657–664.

ISNA (1997). Diamond & Sigmundson publish recommendations. Press Release

@ <http://www.isna.org/search/node/diamond>.

Kimura, D. (1992). Sex differences in the brain. Scientific American, September, 81–87.

Kipnis, K., & Diamond, M. (1998). Pediatric ethics and the surgical assignment of sex. The Journal of Clinical Ethics, 9, 398–410.

Kipnis, K., & Diamond, M. (1999). Pediatric ethics and the surgical assignment of sex. In A. D. Dreger (Ed.), Intersex in the age of ethics (pp. 172–193). Hagerstown, MD: University Publishing Group.

Kotula, B. D. (2002). The Phallus Palace: Female to male transsexuals. Los Angeles, CA: Alyson.

Kruijver, F. P. M., Zhou, J. N., Pool, C. W., Hofman, M. A., Gooren, L. J. G., & Swaab, D. F. (2000). Male-to-female transsexuals have female neuron numbers in a limbic nucleus. Journal of Clinical Endocrinology and Metabolism, 85, 2034–2041.

Martin, N. G. (1978). Genetics of sexual and social attitudes in twins. Twin Research: Psychology and Methodology, 24A, 13–23.

Mathews, R. I., Perlman, E., Marsh, D. W., & Gearhart, J. P. (1999). Gonadal morphology in cloacal exstrophy; implications in gender assignment. British Journal of Urology International, 84, 99–100.

May, L. (2005). Transgenders and intersexuals: Everything you wanted to know but couldn't think of the question. Bowden, Australia: East Street.

Mayer, A., Lahr, G., Swaab, D. F., Pilgrim, C., & Reisert, I. (1998).

The Y-chromosomeal genes SRY and SFY are transcribed in adult human brain. Neurogenetics, 1, 281–288.

Meyer-Bahlburg, H. F. L. (2005). Gender identity outcome in female-raised 46,XY persons with penile agenesis, cloacal exstrophy of the bladder, or penile ablation. Archives of Sexual Behavior, 34, 423–438.

Money, J. (1963). Cytogenetic and psychosexual incongruities with a note on space form blindness. American Journal of Psychiatry, 119, 820–827.

Money, J. (1975). Ablatio penis: Normal male infant sex-reassignment as a girl. Archives of Sexual Behavior, 4, 65–71.

Money, J., & Ehrhardt, A. (1972). Man & woman, boy & girl. Baltimore, MD: The John Hopkins University Press.

Money, J., Hampson, J. G., & Hampson, J. L. (1955). An examination of some basic sexual concepts: The evidence of human hermaphroditism. Bulletin of The Johns Hopkins Hospital, 97, 301–319.

NOVA (2001). Sex unknown. In B. Burns (Ed.), PBS, WGBH-TV, Boston.

Perkins, A., & Fitzgerald, J. A. (1992). Luteinizing hormone, testosterone, and behavioral response of male-oriented rams to estrous ewes and rams. Journal of Animal Science, 70, 1787–1794.

Phoenix, C. H., Goy, R. W., Gerall, A. A., & Young, W. C. (1959). Organizing action of prenatally administered testosterone propionate on the tissues mediating mating behavior in the female guinea pig. Endocrinology, 65, 369–382.

Plomin, R. (1990). The role of inheritance in behavior. Science, 248, 183–188.

Plomin, R., & Asbury, K. (2005). Nature and nurture: Genetic and environmental influences on behavior. The Annals of the American Academy of Political and Social Science, 600, 86–98.

Rangecroft, L. (2003). Surgical management of ambiguous genitalia. Archives of Disease in Childhood, 88, 799–801.

Rangecroft, L., Brain, C., Creighton, S., Di Ceglie, D., Amanda, O.-S., Malone, P., et al. (2001). Statement of the British Association of Paediatric Surgeons Working Party on the surgical management of children born with ambiguous genitalia. Downloaded from http://www.baps.org.uk/documents/intersex statement.htm.

Reiner, W. G. (2004). Psychosexual development in genetic males assigned female: The cloacal exstrophy experience. In M. Diamond & A. Yates (Eds.), Child and adolescent psychiatric clinics of north america: Sex & gender (vol. 13, pp. 657–674). Philadelphia, PA: Elsevier.

Reiner, W. G. (2005). Gender identity and sex-of-rearing in children with disorders of sexual differentiation. Journal of Pediatric Endocrinology & Metabolism, 18, 549–553.

Ridley, M. (2003). Nature via nurture: Genes, experience, & what makes us human. New York: Harper Collins.

Schober, J. M. (2001). Sexual behaviors, sexual orientation and gender identity in adult intersexuals: A pilot study. Journal of Urology, 165, 2350–2353.

Segal, N. L. (2000). Entwined lives: Twins and what they tell us about human behavior. New York: Plume.

Short, R. V. (1979). Sexual behavior in red deer. In H. W. Hawk (Ed.), BARC Symposium (Beltsville Symposia in Agricultural Research), vol. 3: Animal reproduction (pp. 365–372). New York: Wiley.

Wong, J. (2004). Twin peaks. The Globe and Mail (Toronto, Canada newspaper), June 25, F1, F3–F5.

Zderic, S. A., Canning, D. A., Carr, M. C., & Snyder, H. M. (2002 Pediatric gender assignment: A critical reappraisal. New York: Plenum.

Zhou, J.-N., Hofman, M. A., Gooren, L. J. G., & Swaab, D. F. (1995). A sex difference in the human brain and its relation to transsexuality. Nature, 378, 68

END NOTES

[1] Not all societies limit themselves to only two choices.

[2] In contexts, such as in lesbian or gay readings or conversation, one's *sexual identity* can indicate if the person sees self as heterosexual, homosexual, or bisexual. Among sexologists, however, one's relation to a sexual partner is called *sexual orientation* or *sexual partner preference*; identity refers to how one sees self as male or female, man or woman.

[3] The study was conducted on the relatively isolated and uninhabited 10,600 hectare island of Rhum off the west coast of Scotland where about 1,200 red deer were free ranging.

[4] In a well known legal case a 13 year old girl is cited as reporting to her psychiatrist that "he grew up in his first years of life believing that he was a boy" and that "he has always thought of himself as a boy." This teenager was allowed to proceed to transition (Alex, 2004). The recognition of being different from others is central to Deryl Bem's developmental theory of sexual orientation "Exotic Becomes Erotic" (Bem, 1995). In that similarity our theories are comparable. But in many significant ways they are not. The awareness of being male or female is one of the earliest features of development and children learn very early—by 3 or 4 years of age—to which sex or gender they are supposed to belong. Preschool

children will readily and vigorously correctly declare they are boy or girl if questioned or provoked. The average child will repeat the identification given by parents. The transsexual child, although reared in a typical manner will nevertheless identify as a child of the opposite gender. In contrast to this early adamant knowledge of gender, sexual orientation preferences will usually not become recognized until or after puberty. A study by the CDC of 34,706 7th–12th graders, found that 10.7% described themselves as unsure of their sexual orientation. And the direction of this attraction, androphilic, gynecophilic or ambiphilic, did or did not accord with their professed gender or original feeling of being different (CDC, 2002).

[5] The brain areas found among transsexuals that are different from the typical are the sexually dimorphic regions called the central subdivision of the bed nucleus of the stria terminalis (BSTc). This area differs in males and females both in size and in neuronal number.

[6] There are two known cases where male conjoined twins with a single set of genitals were separated shortly after birth. The babies with a penis were raised as boys and their twins as girls. In both cases the ones raised as girls, as they came into puberty, asserted their identity as males (Diamond, 1999; Wong, 2004).

[7] For an extension of the nature–nurture interaction debate see also Harris (1998), Diamond et al. (1996) and Ridley (2003).

[8] David's story is a unique one of masculine development. Other examples can be found in *The Phallus Palace* (Kotula, 2002), *Transsexuals and Intersexuals* (May, 2005), and *Becoming a Visible Man* (Green, 2004). For the development of female sexual and gender identity in persons raised as males see the personal stories in the aforementioned Kotula and May books and in *Transgenderism and Intersexuality in Childhood and Adolescence* (Cohen-Kettenis & Pfäfflin, 2003).

[9] *Self-testing,* for those such as transsexuals—or individuals with gender doubts—is challenging oneself significantly to personally measure "Am I male or female; am I a man or not?" This might go to extremes where the male, for instance, decides to join the Marines or Paratroops and then volunteers for life-threatening assignments ("This will prove I am a man or make a man out of me.") A female in self-testing might become a stripper or purposely get pregnant (Diamond, 1996). The significant feature of all these actions is that those "self-testing" find they can pass the test but, nevertheless, feel they must transition. While they can manifest same they realize they are and must live *different*.

[10] Virginia Prince coined the term transgender around the year 1970. She used

it to distinguish males like herself from transsexuals. She called herself a transgenderist and wanted to live as a woman but did not want surgery or think it necessary. In contrast transsexuals usually feel it imperative that surgery be part of their transformation process of male-to-female (M2F) or female-to-male (F2M). Now the term transgender has come to be used in all sorts of ways that generally refer to individuals who somehow bend or blend gender categories.

[11] MSM refers to those males who do not consider themselves gay or associate with this social group but nevertheless are men who have sex with other men. The term FSF is not common but has comparable meaning for females.

[12] There are many newsworthy accounts of homophobic and transphobic aggression. Not to downplay the significance of these hate crimes, it is my impression, however, that almost every boy has experienced at least some physical assaults and fights to defend himself for one reason or another. It is just a part of growing up "boy."

[13] The insignificance of the penis in fostering a feeling of masculinity is probably most strongly indicated by female-to-male (F2M) transsexuals. Female individuals born with XX chromosomes, ovaries and a vagina, and no obvious male physical characteristics, nevertheless, see themselves as males and undergo psychiatric counseling, hormonal treatment and surgery to foster a male appearance and life. While they aspire to masculinity and typically undergo surgical breast and uterus removal and other reconstructive surgeries, it is estimated that in about half of such cases phalloplasty is not pursued. For these persons satisfying their brain's dictates to live and interact as a man in society as such is more important than satisfying some of society's myths that a phallus is needed to document masculinity. In contrast, male-to-female transsexuals, despite having a penis, feel a negative or no attachment to a penis and do not see it as part of their identity. It is not the presence or absence of a penis but the sex of the brain—how it has developed—that determines how one comes to identify as male or female and how one wants to live.

[14] Prenatal programming and biasing work through alterations of the nervous system; thus can be said to reflect brain sex. During prenatal development the nervous system, the brain in particular, is programmed along a track that is usually concomitant with the development of other sex appropriate structures like genitals and reproductive organs. The brain, however, as in other Intersex conditions, can develop along one sex/gender path while other organs develop along another. Put simply, the brain can develop as male while other parts of the body develop as female. Further, it is important to recall that the developing nervous system controlling gender-linked behaviors is more sensitive to certain

stimuli than are the tissues forming genitals and thus can be modified while the genitals are not. I think that transsexuals are intersexed in their brains.

[15] Actually, as discussed years ago (Diamond, 1965), it might be easier for intersexed children to be sex reassigned than are typical children since they have already demonstrated biological markers of being "partially already there." This might be a reason that some sex-reassignments appear to be accepted. This flexibility, however, without foreknowledge of how the brain has been affected by the intersex condition, is not justification to transform the child without his or her informed consent (Beh & Diamond, 2000, 2005b).

Back to top

This page was last updated on October 4, 2009 .

For any problems related to this web site, e-mail the webmistress at mockford@hawaii.edu.