

Is biology destiny? Discuss with reference to the development of a gender identity

“It is fatal to be a man or a woman pure and simple; one must be woman-manly or man-womanly” - **Virginia Woolf**

For many decades, the nature-nurture debate has continued to appear in scientific, religious and educational studies. The controversial topic has raised many questions about how a child's gender identity is formed. Most theorists do not see biological nature and the rearing environment as independent of each other; rather, the *interaction* between these components in order to create a gender identity is stressed. The degree of importance that is placed on either biology or environment, however, differs, and provides the basis for much of the continuing research into this topical area.

Gender is one of the most important and fundamental aspects of our identity; it can be described as a category that dictates societal views of individuals, and determines how humans come to view themselves (Whitehead, 2000). Individuals are born or assigned a sex at birth, male or female, and every known culture distinguishes between male and female (Gross, 2005). Yet it is the social assumptions made about the different sexes that determine one's gender (masculine or feminine). A gender identity serves as an internal monitoring system for governing choices and directing behaviour (Whitehead, 2000). It is defined as one's internal awareness and experience of gender – that is, one's sense of oneself as a woman or a man. This includes an awareness of biological sex, knowledge about gender and concepts of masculinity and femininity in one's culture (this information is stored in one's gender schema (Bem, 1974)) and an internalisation of cultural norms concerning gender. As a result of 'matching' one's behaviour to the knowledge stored in one's gender schema one chooses to behave in ways that are regarded as appropriate for one's sex.

The formation of a gender identity is, however, affected by the stereotypes and expectancies (the cultural norms) that permeate each society. A gender stereotype refers to the widely held cultural beliefs about the characteristics of males and females, and the resulting picture is usually an exaggeration of these characteristics. Group membership to each category (male or female) is emphasised, and individual differences are largely ignored. Throughout childhood, one will have a growing awareness of one's sex and corresponding gender. As a child gains more and more knowledge about the expectancies and norms of this gender, they will gain more information to store in their gender schema, and will often thus choose to exhibit behaviour that coincides with the norms of this gender.

There are two types of behaviours under the heading 'sex-stereotypes'. These are, namely, sex-roles and sex-traits. Sex roles are those roles and activities that are considered more appropriate for one sex rather than the other. For example, women have traditionally been assigned the domestic, childrearing role, or secretarial roles in the occupational field. Men, in contrast, were (and still are) expected to perform the 'Breadwinner' role – providing financial support for their family by being successful in the job market. Sex-traits refers to those psychological characteristics, personality traits and ways of behaving that are considered more appropriate for one sex rather than the other.

Women, then, are traditionally kind, caring, submissive nurturers, whilst men are typically considered to be aggressive, competitive, dominant and independent. The sex traits form two distinct clusters, one containing traits thought to be characteristic of women (warmth-expressiveness cluster) and one containing traits thought to be characteristic of men (competency cluster). To be truly feminine or masculine, one has to develop the traits stereotypically associated with their sex and avoid those associated with the opposite sex. Doyle (1989) claims that the most important aspect of masculinity is avoiding femininity. Deaux and Lewis (1984) infer that:

A number of separate components of gender stereotypes can be identified: specifically, traits, role behaviours, occupations and physical appearance, each of which has a masculine and feminine version. Although no component is seen as the exclusive province of one or the other sex, masculine and feminine components are significantly more strongly associated with males and females respectively. The like-sex components (e.g. male roles behaviours and masculine traits) bear some relationship to each other, but correlational analysis suggests that they are best viewed as separate factors that can vary independently (p. 49).

These sex-stereotypes are not confined to British society – indeed, they are generally considered to be universal, especially the sex-roles that are performed by men and women the world over (William and Best, 1982). Yet is this simple dichotomy between the sexes due to biological factors alone, or has historical patriarchy, that existed to dominate over women, maintained their supposed inferiority to such a degree that women's lifestyles and choices have been dictated throughout the centuries? And has men's role as the 'breadwinner' confined them to a life of solitude and competition, unable to express their emotion and suffer the pressure to be the best? Whilst the onset of the feminist movement in the past century has seen a change towards the expected roles and traits of women (Whitehead, 1994) the traditional stereotypes for both men and women still remain, and is a key factor in the development of a child's gender identity.

It must be remembered that there are considerable biases involved in researching gender differences and gender identity. For centuries this bias in psychology had been used to keep women in their subordinate 'place', yet there is also, naturally, bias on the feminist front, with researchers using their findings to highlight their cause and not objectively reviewing the facts. Hence the many theories about acquiring a gender identity are fraught with contradiction and criticism, and it is important to keep this in mind.

Biological theories about human gender experience can be broken down into two distinct groups – those that believe genetic differences contribute to the different characteristics commonly displayed between men and women (Wilson, 1978) and the biogenico-evolutionary theorists, who look to prehistoric human behaviour and sex-roles in order to account for the biological – and character – differences between the sexes today. The biological theory has contributed to interesting debates worldwide, not least the controversial double standard of sexual conduct that condones male promiscuity and restricts female sexual activity, which is thought to be programmed by genetic material (Symons, 1979; Wilson, 1982).

Reiner (in Fletcher, 1997) argues that the organ that appears to be critical to psychosexual development and adaptation is not the genitalia but the brain. The brain is the site of the many sex hormones secreted into the body post-birth. Prenatally the gonadal tissue secretes H-Y antigen to create testes, or in its absence ovaries are developed some weeks later. Three hormones (oestrogen, progesterone and testosterone) are present in all humans, but it is the varying amounts in the womb of these hormones which dictates whether the foetus will have male or female genitals. Supporters of the biological approach argue that males and females are biologically (genetically) programmed for certain kinds of activities compatible with stereotypical male and female roles.

A case often cited in favour of the biological approach is the Batista family (Imperato-McGinley, 1974) in the Dominican Republic. Four of the ten children in the family were born daughters with normal female body shape and function, yet at age twelve, due to a flood of testosterone (which in turn produces dihydrotestosterone) their vaginas healed over, two testicles descended and they grew full size penises. 37 Dominican Republic children in total have experienced this change, and the mutant gene that causes this change can be traced back to common ancestor Attagracia Carrasco. This mutant gene only shows when carried by both parents. The transformed boys' ability to adopt a male gender identity and gender role suggests that their testosterone had preprogrammed masculinity into their brains.

Differences in the male and female brain have been discovered, first in rats (Dorner, 1976) and now also in humans. Scientists are calling these differences the male or female sex centre. Destroying small parts of a rat's sex centre resulted in new-born rats behaving as if they were female (Dorner, 1976). Yet the extent to which these centres have an impact on human sex-behaviour is not known. For example, Daphne Went, although chromosomally male, has a female external appearance, is married, and leads an active and successful life as a woman (Goldwyn, 1979).

However, there is some evidence of sex differences in hemispheric specialisation – for example, when males perform spatial tasks, there's greater electrical activity in the right hemisphere (Bryden & Saxby, 1985). In women, both hemispheres are activated. According to McGlone (1980), the right hemisphere is usually the dominant one in men, while the left is generally dominant in women. Despite evidence that the corpus callosum is larger overall in women and longer towards the back of the brain (an example of a dimorphic characteristic), Kimura (1993) as warned against accepting this evidence uncritically.

Biological theorists also use the argument that the sexes behave differently even when babies to suggest that differences between the sexes are innate. Girls smile more, have more regular feeding patterns, and react more to being spoken to than held. They also engage in more communication than boys, maintaining twice the amount of eye contact with silent adults than males of their age. Boys, however, cry more and react the same to both words and being held. They also take a 'little and often' approach to feeding (Nicholson, 1993). Of course this could also be due to the fact that mothers are reported to speak more to girls after 48 hours of giving birth and picking up and playing more boisterously with boys (Nicholson, 1993) which suggests that the parents' perception of boys and girls is very different, and they treat them in accordance with the appropriate sex-stereotype that their parents used on them as children.

Thus the sex-traits that are allocated to each gender (masculine or feminine) are assumed to be genetically 'programmed' into boys and girls. Girls,

due to their weaker frame, unpredictable emotions and physique due to the menstrual cycle, and their ability to bear children 'naturally' possess such traits as kindness, ability to comfort and nurse, to soothe, empathise and nurture. Men, due to their larger frame, possess a competitive, promiscuous and protective nature, and stable bodily physique (they do not get pregnant, nor have the setbacks of a monthly menstruation). These traits are then suited to the roles that they have performed throughout the years, namely women as mothers, childrearers and home-makers, and men as hunter-gatherers, the providers and protectors of the family. The biologist perspective thus derives any sex differences such as increased verbal and communicative ability in females, and better visual-spatial and mathematic ability and an increased aggressive nature in males (Maccoby & Jacklin, 1974), from genetics. Nurture and the environment has little or no effect on these sex-differences.

The biologic-evolutionary theory takes the biological theory into the past, and suggests that it was precisely because of a man's stronger, larger physique and increased stamina that he was better suited to hunting, and straying from the family home. The female, being the child-rearer and immobilized due to pregnancy and sometimes menstruation, could complete the tasks that could be done alone in the home (Betz, 1993). There was a higher survival rate for those with a distinct division of labour (Murdock, 1937).

The male sexual mating pattern could also have played a role in his competitive, aggressive nature and larger physique. As men's sperm is easily replaceable, and women's eggs are invaluable, the female could afford to be choosy as to her mate. The male that could offer her most protection and better genes would be chosen. Hence the male would compete for her attention and compliance with other males, in an attempt to dominate and impregnate her. It may explain why boys are naturally more aggressive and competitive than girls, although this is not always the case. Yet today, strength and mobility are not usually required for most jobs, so there is no longer any need for this division of labour. Why, then, if humans are constantly changing and adapting to their

environment as a result of their genetic heritage, do sex stereotypes still exist and provide the basis for forming one's gender identity?

Social and behaviourist theorists have attempted to answer this question by showing that as a child is born and raised, ideas and opinions about gender will be communicated by parents, teachers, peers, siblings, the media and others. Women, for centuries, have suffered an andocentric world living in a state of Purdah, that is, the social practice of secluding women from the public world. The Hindu code states that, "a woman must never be free of subjugation" to men, and other religions such as Christianity and Islam reinforce female subservience. The intent is to protect a woman's chastity, regardless of whether she is viewed as innocent or sexually deviant.

The inferiority and subordination of women has permeated through to the sex-stereotypes that have derived from historic fact (women have always, in most cultures, played the domestic role whilst men have been the breadwinners) and these stereotypes, in turn, affect the formations of gender identity in children. Understanding these stereotypes, where they come from, and why they arose helps us to understand how children distinguish between a masculine and a feminine gender, and how they form their own gender identities.

The Social Learning theory (SLT) suggests that the sexes behave differently and value different things because they are treated differently by parents when young (Smith & Lloyd, 1978). The Baby X studies carried out by Smith and Lloyd suggest that adults react to babies according to their supposed sex (even when no sex difference is observed between the babies) giving hammers and freedom to males and talking to females, giving them dolls or soothing them when they struggle. The gender-role expectations permeate through all adult interaction with the young. Often the first question at birth is, 'Boy or girl?' The social learning theorists suggest that children learn the appropriate behaviours for their sex through canalisation, imitation and reinforcement. Parents do not give opportunities for each sex to develop an alternate gender than the one their biological sex has assigned to them. Parents do not usually buy or give their sons dolls to play with, for example. Parental behaviour is also imitated by

children – they often identify with or copy the activities of their own sex parent. A girl may see her mother cooking and serving supper, and is thus more likely to play with a toy cookery set than males are. Finally, positive or negative reinforcement either encourages or discourages the child from behaving in a certain way (Bandura, 1977b).

Fathers, it seems, are more prone to reinforce appropriate sex-behaviour in their children, most notably sons, than their mothers are. Fathers not only treat children in a more gendered way than mothers (Maccoby, 1990) but often give more attention to sons (Quiery, 1998). This may be because it is crucial for male success to adhere to the sex-stereotype set out for them whereas there is more flexibility for girls. Boys tend to be positively reinforced more for behaviours reflecting independence, self-reliance and emotional control. Girls tend to be reinforced for dependence, nurturance, empathy and emotional expression (Block, 1979).

Although parents believe they respond in the same way to aggressive acts committed by boys and girls, they actually interfere much more frequently and quickly when girls behave aggressively (Huston, 1983). Thus boys and men are more likely to imitate aggressive male models than are girls and women (Bandura et al., 1961, 1963). Children are likely to transfer the information and behaviours they have received and practiced from one domain to the next, for example, from the home setting to the school setting. The media also exerts considerable influence over children, and are fraught with gender stereotypes (Wober et al., 1987). Moreover, children categorised as 'heavy' viewers of TV hold stronger stereotyped beliefs than 'lighter' viewers (Guster, 1986).

The social learning theory has however been criticised. Firstly, according to Maccoby and Jacklin (1974), there is no consistent difference in the extent to which boys and girls are reinforced for aggressiveness or autonomy. There appears to be a remarkable uniformity in how the sexes are socialised. Lytton & Romney (1991) found very few sex differences in terms of parental warmth, overall amount of interaction, encouragement of achievement or dependency, restrictiveness, discipline or clarity of communication. Also, although Bandura et

al.'s work is often cited, the evidence concerning imitation and modelling is actually inconclusive and some studies have failed to find that children are more likely to imitate same-sex models than opposite-sex models. Indeed, children have been shown to prefer imitating behaviour that's 'appropriate' to their own sex regardless of the models (Maccoby & Jacklin, 1974).

The view that TV can impact upon a passively receptive child audience with messages about sex-role stereotyping, and mould young children's conceptions of gender is over-simplistic. For Guster and McAleer (1997), children respond selectively to particular characters and events and their perceptions, memories and understanding of what they've seen may often be mediated by the dispositions they bring with them to the viewing situation. Whilst 'heavy' TV viewers might hold stronger stereotyped beliefs than other children, no precise measures were taken of the programmes they actually watched.

Finally, whilst modelling plays an important role in children's socialisation, there's no consistent preference for the same-sex parent's behaviour (Hetherington, 1967). Instead, children prefer to model the behaviour of those with whom they have most contact (usually the mother). Also, there is no significant correlation between the extent to which parents engage in sex-typed behaviours and the strength of sex-typing in their children (Smith & Daghish, 1977). However, father's adoption of either traditional (sex-typed) or egalitarian attitudes has been found to correlate with four-year-olds' perception of sex-roles (Quiery, 1998).

Another theory which carries considerable weight is the Cognitive-Developmental Theory (CDT), developed by Kohlberg, 1969 and Kohlberg & Ullian, 1974. This places emphasis on the child's participation in developing both an understanding of gender and gender-appropriate behaviours. Children's discovery that they're male or female causes them to identify with members of their own sex, not the other way round, as psychoanalytic and social learning theories suggest. While rewards and punishment influence children's choice of toys and activities, these don't mechanically strengthen the stimulus-response

connection, but provide children with information about when they're behaving in ways that other people deem appropriate (Bandura, 1977a).

There are three stages to a child's acquisition of male or female understanding. Firstly, the gender labelling or basic gender identity is acquired at age 3 (Ruble, 1984). According to Kohlberg, knowing one's gender is an achievement that allows us to understand and categorise the world. But this knowledge is fragile, and children don't yet know that boys become men, and girls become women. Stage two is gender stability, at age 4-5. Children recognise that people retain their genders for a lifetime, yet they still rely on superficial signs (for example, length of hair, clothes etc.) to determine gender (Marcus & Overton, 1978). Finally, at age 6-7, children realise that gender is immutable and constant, regardless of appearance. This significantly appears shortly after the child has mastered the conservation of quantity (Marcus & Overton, 1978).

Once this final stage has been reached (gender constancy), children come to value the behaviours and attitudes associated with that sex. Only at this point do they identify with the adult figures who possess the qualities they see as being most central to their concepts of themselves as male or female (Perry & Bussey, 1979). There is evidence that the concepts of gender identity, stability and constancy occur in that order across many cultures (Munroe et al., 1984). They also actively construct their gender-role knowledge through purposeful monitoring of the social environment. Ultimately, this theory suggests that children engage in self-socialization, rather than passively receiving information (Whyte, 1998).

A major problem for CDT is that it predicts there should be little or no gender-appropriate behaviour before gender constancy is achieved. Yet even in infancy, both sexes show a marked preference for stereotypical male and female toys (Huston, 1983). Whilst children may have developed a sense of gender identity, they are, according to CDT, some years away from achieving gender stability and constancy (Fagot, 1983). Early sex-differentiated behaviour, it could

be argued, might be due to early parental reinforcement and canalisation than a biological instinct, although it cannot be certain which plays the most part.

The gender schematic processing theory (GSPT) was developed by Bem in 1981. It is the psychoanalytic approach to the acquiring of gender identity that has had the most empirical support in recent years (Bem, 1983). Bem addresses the possibility that a gender identity alone can provide children with sufficient motivation to assume sex-typed behaviour patterns (Martin, 1991). Like the SLT, this approach suggests that children learn 'appropriate' patterns of behaviour through observation. However, consistent with the CDT, children's active cognitive processing of information also contributes to their sex-typing.

Parents shape their children's behaviour, discourage feminine behaviour in men (although girls who are masculine are much more tolerated, possibly because they are displaying the same valued characteristics as men, such as independence, dominance and a love of physical activity). Through this mechanism, according to Bem, children will develop a gender schema which will reflect social and cultural norms about gender. Between the ages 3-5, once understanding that gender is a fixed category, children begin to apply gender categories to themselves (Whitehead, 2000). According to GSPT, children learn to judge themselves according to the traits considered to be relevant to their genders.

Consequently, the self-concept becomes mixed with the gender schemas of a particular culture, that is, all the information about traits and roles that comprises gender (masculinity or femininity). This provides the child with standards for comparison. This theory sees gender identity as being sufficient to produce 'sex-appropriate' behaviour. In essence, children with a gender identity (a knowledge of themselves as male or female, and the subsequent gender expectations linked to their sex) will actively seek information for their gender schema, and their self-esteem will soon become influenced by how they 'measure up' to their gender schema (Rathus, 1990), especially in adolescence.

It involves, 'matching one's behaviours against the developing gender schema results on the child's evaluation of her or his adequacy as a person

(Doyle & Paludi, 1998: 58). Usually, most children choose to exhibit behaviour which conforms to societies norms, thus sex-stereotypes and differences are maintained (Bem, 1993). Gender schema theory has been hailed as the most useful of theories for explaining the development of gender behaviour in individuals or colour (Reid et al., 1995).

Freud's psychoanalytic theory stemmed from his belief that children identified with the same sex parent, as a result of being envious of their father's possessiveness of the mother. This results in the acquisition of both a superego and a gender identity. Girls, too he thought, saw their brother's penises obtruding from the body, and developed 'penis envy', regarding the male sex as superior for their external phallus. Thus the only way to calm their feelings of jealousy was to follow in their mother's footsteps and give birth to sons. Like the development of a conscience, Freud also saw the development of a gender identity as being weaker in girls than boys.

Freud's theory is riddled with doubts and criticism. Krebs and Blackman assert that children of a particular age don't seem to acquire a gender identity in 'one fell swoop' (Krebs & Blackman, 1988). Also, children who grow up in 'atypical' families (for example, single-parent or lesbian couples) are not necessarily adversely affected in terms of their gender identities (Golombok et al., 1983). Indeed, children reared in fatherless families (lesbian or heterosexual) appear to have more secure attachments (Golombok et al., 1997). In homosexual families, children raised show no indications that sexual identity or orientation is affected by having two same-sex parents. Sometimes they are more child-orientated, perhaps motivated by a sceptical and hostile world. Finally, whilst identification might promote gender identity, children are aware of gender roles well before the age at which Freud believed their Oedipus complex is resolved. For example, boys prefer stereotypically masculine toys, such as trucks, whereas girls prefer 'feminine' toys such as dolls in infancy (O'Brien et al., 1983).

Cultural relativism represents the most direct challenge to the biological theories about gender. If gender differences reflect biological differences, then

we'd expect to find the same differences occurring in different cultures. Any differences that exist between cultures with regard to gender roles (cultural relativism) support the view that gender role is culturally determined. Margaret Mead researched three tribes in 1935, and found distinct differences in the way men and women lived their lives in relation to one another, which contradicted the traditional normative roles that have stereotypically been carried out by males and females in the West. Thus Mead concluded that the traits called masculine and feminine are unrelated to biological sex, as gender role and temperament can differ according to the needs of separate cultures.

Of course, these views very much see gender construction as an either / or situation – either biological, or psychoanalytical. There are, however, those who feel that, “To consider masculinity [or femininity] as dependant on innate biological factors is to misunderstand the basis of genetics. But to consider masculinity [or femininity] as a purely social construct with no physiological basis is scientifically dangerous” (Treadwell, 1987). So, whilst some scientists theorize that male and female genders and traditional gender-typed characteristics such as male aggressiveness and female nurturance are largely the result of genetic differences (Wilson, 1978), others find little or no research evidence for the idea that biology is the sole cause of either gender-related roles or gender-typed behaviours or characteristics (Blair, 1984; Pleck, 1981). Sociobiologists believe that genes alone are inadequate to explain the complexities of such social behaviours (Lewontin, Rose and Kamin, 1984).

Edward Wilson (1978) was a major proponent of the sociobiological theory. He defined it as the systemic study of the biological basis of all forms of social behaviour (1978: 16). It draws data from genetics, anthropology, psychology and sociology, hence it is an interdisciplinary science. Sociobiology believes that certain behaviours are inherited through one's genes, and these behaviours have proved advantageous to the species survival throughout the evolutionary period. Certain social behaviours 'become genetically encoded in a species if they contribute to the fitness of those individuals that have them' (van der Berghe, 1978:20). So the question put forth, 'do women have a maternal

instinct?' can be researched by the four disciplines above and then conclusions drawn. Anthropologist Lila Liebowitz (1989) suggests that the early division of labour was moulded by socioeconomic considerations, not biological imperatives. Sociologist Alice Rossi (1977) believes that biology creates the strong mother-infant bond, as they have greater involvement with the child throughout infancy than fathers, so they display less attachment (this view is criticized by Chodorow, 1977;1978).

However, the criticisms of socio-biology mainly lie in its, 'opening the door to justify the oppression of one group by another group on the basis of biological inferiority' (Rogan, 1978:85). Also, the basis of biology appears to rest on the existence of some as yet unidentifiable genes. It is unreasonable to point out behaviours as a result of genetic material and then be unable to pin-point these genes. There are also extreme differences in terms of time, as biological evolution may take many 10,000 years whereas within a few decades the cultural demands and social behaviours can completely change. Research also suggests that, given the opportunity, fathers do attach a born with newborn children. This is called engrossment (Greenberg & Morris, 1974). Finally, Brittain (1996) believes the sociobiological approach relies too much on an overly simple or reductionist explanations for some very complex issues.

Yet it is apparent that both social and biological factors are needed in order to construct gender identity. For example, it is illogical that biological acceleration may be given as an explanation of girls' rapid acquisition of language skills (Maccoby & Jacklin, 1974) and their ability to excel in fine motor skills, whilst an expectation of inferior performance in gross motor activities remains. Sandra Bem (1981) concluded that differences in motor performance appear to be influenced by both biological and environmental factors. The low expectations that parents and teachers have with respect to girls' motor performance, in addition to the lack of rewards given to girls for such activities, apparently combine to produce low motivation and low performance levels for girls in the behaviours that have been societally defined as appropriate for boys.

However, gender construction does not simply involve a passive reciprocation on the part of the child. Rather, children actively engage with and respond to their environment (Piaget, 1958; Kohlberg, 1976). They are biologically prepared to organise their world, in stages, to achieve mastery over their environment and competence in dealing with it. This is compatible with Bem's (1981) theory that children actively develop a gender schema in order to develop a gender identity. Children's preference (measured by, for example, the ITSC (Brown, 1956)) suggest that girls have masculine preferences and perceive western culture to be male-orientated, giving men an advantage over women (Paludi, 1981b). However, others such as social learning theorists, see the child as passive recipients to stimuli (Bandura, 1969) and take no active role in their development.

The question, 'is biology destiny?' is, therefore, ambiguous, and has an ambiguous answer. Whilst a woman can be chromosomally female, she can display preferences for male activities, or even indeed become a male, through choice (in the case of transsexuals) or through nature, such as the case of the Bata boys. Alternatively, a chromosomal male may decide they would prefer to be a woman (such as the case of Daphne Went). It is important to remember that when heterosexual babies are born, their sex is assigned to them (or sometimes reassigned to them up to the age of 2 years). Their genitals are either ambiguous or externally the opposite of their chromosomal sex. This can be caused by the adrenogenital syndrome, causing genetic females to develop penises (micro or normal), or the androgen-insensitivity syndrome, in which genetic males develop the external appearance of women, sometimes with an enlarged clitoris. These cases are caused by the imbalance of hormonal output or uptake in the foetus. Their external genitals can be corrected via surgery and hormones can be artificially taken to enable the proper development of a girl or boy.

However, sometimes the sex assigned at birth is not compatible with their genetic sex, and in a hermaphrodite child this is usually not a problem. Chromosomal girls have often been reared as boys and vice-versa. This suggests upbringing has a powerful influence on the child's development of a

gender identity. However, it may be the case that these hermaphroditic children either did not have enough of the correct hormone to 'masculinise' their brain or had too much androgen to prevent 'feminizing' their brains. Thus their sex could, in effect, be chosen based on the development of their external genitalia. Yet if a normal baby were to be born and changed into a member of the opposite sex, as was the case with the Bruce / Brenda baby, what would happen?

Bruce, twin to Brian, was born normal and healthy. After a circumcision accident, his penis was burnt off and his mother turned to John Money for help. Money (1973) changed Bruce into a girl, at 21 months of age, and she was renamed Brenda. She was given correct hormones, had the appearance of a girl, and was brought up as a girl. Whilst, throughout her tomboyish childhood, the case appeared to be a success, adolescence brought its many problems. She was lonely and unhappy, had few friends and had no self-esteem. On being told of her original sex at age 18, she immediately had a sex change in order to revert back to being a male – this, she felt, was the thing that was causing her unhappiness. Brenda, now David, attempted to commit suicide at 21, unable to deal with his changing gender identity at such a late age, and finally succeeded in taking his life in 2004. This case suggests that genetics are a powerful force that artificial hormones and environment cannot always rival. The Bruce / Brenda case suggests that sex and gender can not be artificially implanted; rather, sex and the corresponding gender are biologically determined.

Biology certainly plays a part in dictating the way that humans choose to behave. Many children, who have a secure gender identity throughout childhood, or who believe gender to be simply one element of their personality (not the sole construction of their being), do not conform to stereotypical ideals about gender (Whitehead, 2000). Individual differences within the sexes, whilst largely ignored by stereotypes, actually constitute greater individual differences than do between-sex differences. The sexes are actually more similar than most people think. Bem (1974) has constructed the idea of an androgynous being, combining the better and most compatible qualities of both the sexes. The changing times will constantly be in tension with the stereotype of gender, especially for females,

as they gain more independence and equality in the workplace, and freedom from the ties of childrearing.

Males too, it seems, are less content to play the typical macho 'masculine' figure, which causes them dangerous health hazards such as extreme stress and depression, and with women gaining ground in the workplace, some men are taking a more active role in the family. Biology will always play a large role in determining our behaviour. Yet it appears that just as the culture in which heterosexuality was the norm for centuries is embracing a homosexual sub-culture, the andocentric world is beginning to accept a change in the stereotypical gender roles and traits. Whilst these historically derived stereotypes will not die fast, they can provide a readily-available (if albeit harmful) tool to help children to form a personal gender identity, in order to relate to themselves as male or female. The question, then, does not lie in whether biology determines our lifestyle, but whether or not one allows the stereotypes and cultural expectations assigned to ones sex affect the way their lives are led. As more women and races are defying the typical white heterosexual male patriarchy and choosing to live their lives in non-traditional and non-conformist ways, so children will pick up on these differences and, in centuries to come, will perhaps store these roles as the 'typical' norm for which women and men abide by in the future, and will begin to appreciate and embrace the growing phenomenon that is plurality.