

Brain Gender and Transsexualism

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1. Introduction

Investigations by neuroscientists in the Netherlands on an area of the brain known as the central subdivision of the bed nucleus of the stria terminalis (BSTc), a collection of cells in the hypothalamus, confirm that in this tiny region of the brain there is a distinct difference in volume between males and females. The BSTc region is within a part of the brain that is in some way ‘essential for sexual behaviour’ (Zhou et al. 1997). Neuroscientists discovered that in transsexual females, those considered male at birth, but who had a strong conviction that they were female, the BSTc region was similar in size to the female BSTc and transsexuals considered female at birth, but who were certain they were male, had a BSTc volume similar to the male BSTc (Chung et al. 2002). So, what if the neuroscientists are right and there is a link between gender and the BSTc? In the event that these findings prove to be true, then neuroscience could provide another indicator for determining a person’s gender identity, since the research seems to substantiate what transsexuals are saying about their gender, namely that they are not the one assigned them at birth. It may well follow then that the BSTc needs to be included along with the current indicators, namely genitalia, gonads, and chromosomes, given that these indicators alone fail to support the gender convictions of transsexuals, whereas the BSTc may. Transsexuals have been open to discrimination and rights abuses, because up until now there has been nothing to support their convictions regarding gender. This paper sets out to challenge our reliance on the standard gender signifiers alone. If there is a neurobiological basis for our sense of self as gendered, then we ought to consider this and address some of the issues regarding gender identity and transsexualism.

2. Scientific Findings

Zhou, Hofman, Gooren and Swaab (1997) published an article in 1995 in the academic journal *Nature* in which they claim that there is a difference in the human brain in relation to the sexes. Their findings show that the BSTc region of the brain is larger in size in males than in females. They used six male-to-female transsexuals in their initial tests and the findings indicate that the brains of transsexuals are in accord with their convictions with regard to their gender (see Appendix).

Their experiments showed that hormone levels in adulthood did not affect BSTc size. A 46-year-old female with high levels of testosterone due to a tumour had a normal sized BSTc, as did a 31-year-old man with high levels of oestrogen due to a feminizing adrenal tumour. Further, while five of the six transsexuals in the study group had undergone an orchidectomy, one had not. They also studied heterosexual men who, because of cancer, had gone through an orchidectomy and found that these men had BSTc sizes in the male range. Thus, they were able to eliminate the effects of removing the testes as the cause of the small sized BSTc in male-to-female transsexuals.

Another experiment carried out by Kruijver et al. (2000) further supports the Zhou et al. findings, showing that the number of neurons in the BSTc of male-to-female transsexuals was similar to that of females, while female-to-male transsexuals was in the male range. Kruijver team found that:

Sex difference in the BSTc and its reversal in the transsexual brain clearly support the paradigm that in transsexuals sexual differentiation of the brain and genitals may go into opposite directions and point to a neurobiological basis of gender identity disorder (Kruijver et al., 2000).

In a later study Kruijver et al. (2001, p. 824) confirms that their observations and studies on the volume and neuron numbers of the BSTc in male-to-female transsexuals ‘support the idea that steroids do not act in adulthood but, rather, earlier during development to establish gender identity.’

A follow-up study by Chung et al. (2002), which included two female-to-male transsexuals, also confirmed Zhou et al.’s findings (Lawrence 2002). However, Chung’s findings show that the change in volume in the BSTc does not occur until adulthood. If there is a link between the BSTc and gender identity, why is it the case that transsexuals claim a sense of gender dysphoria from a very early age? To explain this problem Chung et al. (2002) hypothesised that foetal or neonatal hormone levels might affect gender identity, and could perhaps simultaneously produce changes in BSTc ‘synaptic density, neuronal activity, or neurochemical content’ that might not affect the BSTc region until adulthood. This interaction may not only be responsible for the early sense of gender dysphoria but also the later change in BSTc volume. The result is a brain that is one gender and a body that is the other.

Zhou et al. (1997) claim that investigation of genetics, gonads, genitalia and hormone levels of transsexuals has not produced any results that might explain their condition. Scientific findings also show that homosexual men have a male size BSTc, while homosexual women have a female size BSTc. This indicates that transsexualism is unrelated to homosexuality. The distinction appears to be neurobiological, although currently it is not possible to detect the difference until the brain becomes available for dissection. All these studies indicate that there are more than three gendered biological parts to the body. Besides the chromosomes, gonads and genitalia, which are all of one gender in transsexuals, there is also the BSTc, which seems to be the other. Most importantly, the BSTc seems to have more in common with the sense of gender identity that transsexuals experience than the other three indicators of gender. In the event that the neuroscientists are correct, then there is justification for treating transsexuals as persons with a neurobiological condition, rather than persons with psychiatric problems. This research is significant because it implies a correlate between transsexualism and brain structure.

3. Transsexualism

Wyndzen (2005) describes a transsexual person as ‘one who establishes a permanent identity with the opposite gender to their assigned (usually at birth) sex.’ Generally speaking, transsexuals are people who have a conviction that they are not the gender assigned to them at birth. Many transsexuals undergo sex reassignment surgery (SRS) to bring their conviction and body into alignment. Transsexuals do not

accept the term ‘sex change’ operation to describe their surgical procedure, believing instead that they are simply going through corrective surgery rather than undergoing an actual sex change. This would indicate that sexual organs are not an absolute indicator of gender.

Not all transsexuals opt for SRS. There are a number of reasons for this. SRS is expensive – costs can exceed \$32,900 for male-to-female surgery (Sydney Morning Herald, 2006). The transition from female-to-male is not currently as successful as from male-to-female – the surgical penis is permanently flaccid (Whittle, 2002, p. 88). Instances of patients left having to walk with the aid of crutches, or severely scarred for life as a result of surgery have resulted in fewer female-to-male transsexuals undergoing sex reassignment operation. Of course, one would anticipate that these problems will be resolved in the future. Although some do not undergo surgery until later in life, if at all, transsexual men and women have a strong conviction about their gender very early in life. One could consider then that any person who has expressed a persistent and strong conviction since early childhood that they are the opposite gender to that which they were born is in fact a transsexual, where transsexualism has shown to be the only contributing factor to that conviction. Nor can one claim that transsexualism is the result of psychiatric problems. Constant psychological monitoring and evaluation ensures that transsexuals are psychologically sound and fit candidates for SRS. Further, the same symptoms of dysphoria can be observed in individuals who, for various reasons (accidental castration, etc.), were surgically reassigned a gender at birth. The medical profession now recognise transsexualism as a medical condition, generally referred to as Gender Identity Disorder (GID).

A number of treatments used in the past to “cure” transsexualism, such as aversion therapy, psychoactive medications, electroconvulsive therapy, hormone treatments consistent with the birth gender, and psychotherapy, have proved unsuccessful (Wyndzen, 2005). We applied all these treatments in an effort to change the convictions of transsexuals about their gender identity, and we based this on the assumption that transsexualism was a psychological disorder. Instead, what the treatments have shown is that transsexuals are no more psychologically unbalanced than the rest of society, that is, to all intents and purposes, transsexuals are normal apart from their GID. The only treatment that appears to be successful for this condition is sex reassignment surgery. The failure of all these past treatments and the success of SRS provide further support for the view that transsexualism is a neurobiological condition, independent of social factors. If this is so, it would be discriminatory to treat a transsexual differently to any other person with a biological disorder. That is, we should not afford treatment to one and not the other. If SRS is the only successful treatment for transsexuals, then we ought to provide this treatment, since to do otherwise would be to discriminate.

4. Discrimination

Discrimination affects transsexuals perhaps more than other minority groups. Andrew Altman (2003) allows two normative senses of discrimination. In the first, it means any differential treatment of the individual that is morally objectionable. In the second sense, ‘discrimination’ means the wrongful denial or abridgement of the civil rights of some persons in a context where others enjoy their full set of rights.

Transsexuals experience both differential treatment that is morally objectionable and a denial of their rights where others enjoy full rights. The outcome of the report, 'Enough is Enough', commissioned by the Victorian Gay and Lesbian Rights Lobby Group found that:

Rejection of people experiencing transsexualism, by their family, friends, employers and a largely ignorant wider society leads to them experiencing the highest levels of depression, suicidal ideation, discrimination and harassment of any of the minorities with sex or gender development contrary to heteronormative expectations (Gurney, 2004).

One such case of a transsexual who experienced discrimination is Mianne Bagger, a 38 year old Danish golfer, prohibited from playing golf on the Ladies European Golf Tour by the LPGA, the body that governs the tour (ABC News, 2005). The LPGA only permit 'natural born' women to participate in the tournament. Bagger, however, was born with the body of a man. As such, she is not a natural born woman based on our current definition of "natural born". The commissioner for the LPGA, Ty Votow, believes that allowing male-to-female transsexuals to compete against 'natural born' women 'would create an unfair effect on the competition'. Bagger disagrees. She claims that, 'the physical advantages she had as a man have actually disappeared thanks to the female hormones she has taken since before undergoing gender reassignment surgery'. She also argues that she has less testosterone in her body now than many women and she has to rely more on accuracy and less on strength. One would never consider it fair that women compete against men on a professional level. However, Bagger said she never considered herself a man.

The claim by the LPGA that there is such a thing as a "natural born" woman, raises the question of what this actually means. Given that "natural born" seems to be based on genitalia, then we may have to reconsider our ideas of gender identity on the basis of the new findings with regard to the BSTc region of the brain. For if the scientists prove to be right, then Bagger and transsexuals like her are "natural born" females in a very real sense. Since this research, we may have to speak in terms of brain gender and body gender. This could amount to according rights to transsexuals on the basis of brain gender rather than body gender.

Another example of discrimination against transsexuals led to the murder of three people. Brandon Teena, a self-diagnosed transsexual, had a conviction that he was a man trapped in a woman's body (Whittle, 2002, p. 95). The movie *Boys Don't Cry* (1999) relates this story. Brandon lived more or less on the streets and could not afford SRS. He went to great lengths to hide his femininity to avoid discovery, dressing and behaving at all times like a male. In December 1993, following a misdemeanour charge, Brandon's identity was reported in the newspapers as female. Following this episode, two of his male friends (who believed all along that Brandon was a male) assaulted and raped him, angry about what they perceived as his gender deception. Brandon reported the incident to the police giving them the names of those involved. However, the police did nothing about the incident. Brandon's sister quotes the Sheriff, Charles Laux, when she rang up to find out why the men had not been arrested, 'You can call it "it" as far as I'm concerned' (Whittle, 2002, p. 96). By classifying Brandon as "it" the Sheriff effectively designated him the status of object – something without consciousness, thoughts, feelings or emotions and

undeserving of the same rights as other citizens. A few days later, the men shot dead Brandon and two of his companions. However, despite the fact that the sheriff failed to be re-elected and the murderers went to prison, it is clear that had Brandon undergone SRS and passed visual scrutiny, this tragedy would not have happened.

A major driving force behind discrimination is ignorance and fear of the disorder. Because there is little understanding of the condition, there is a fear that transsexuals are trying to deceive us in some way. The two transsexual cases cited above highlight some of the issues faced by GID sufferers due to fear and ignorance. Bagger's case highlights the problems of classification, and consequently, exposes the discrimination that occurs for transsexuals in sporting activities because of the fear of putting others at a disadvantage. Brandon's case exposes some of the problems faced by the transsexual who tries to take up a gender role anomalous to their birth gender without undergoing surgery. Perhaps more than anything else, the Brandon case highlights the need to make SRS more readily available for the genuine transsexual. Due to the seriousness of the prejudices against transsexuals, it may be time to change reliance on the current gender indicators alone and include the BSTc. To do less may contribute to discrimination and rights abuses.

5. Indicators Of Gender

Doctors and mid-wives currently rely on the outward appearance of an individual to identify gender. For the majority of us this method of classification works fine. However, a reliance on chromosomes, gonads or genitalia alone proves to be fallible when it comes to transsexuals, since there appears to be some ambiguity between outward appearance and convictions. Therefore, why do we rely on the genitalia, when cases of cancer that result in the loss of genitalia as a treatment do not suddenly result in a person's gender changing from male to female? One could cite many instances where genitalia cannot succeed in defining gender, including women who were born without genitalia. In such cases, the surgeon has to make an incision to create a vagina. Nor can we rely on genitalia in the case of transsexuals or those who suffer from gender dysphoria, or those whose genitalia are ambiguous. Hermaphrodites also challenge this criterion. As a result, the use of genitalia as an indicator of gender is unsatisfactory, especially for those who do not neatly fit our current approach. People are entitled to the correct gender identity (in a world where gender is so significant a factor). However, a system based on genitalia alone fails in this regard because genitalia are not a true indicator of gender.

Those born without any reproductive organs, or hermaphrodites who are born with both, challenge the use of gonads as a method of identification. Some women, for instance, who have undergone hysterectomies, fail this criterion. However, we would never suggest that because of this they were no longer women. Currently, it is possible for women to reproduce without men (cloning). Advances in science are such that experts expect that one day in the future men will be able to give birth to babies without women, ovaries, or a womb. This will certainly challenge the idea of the usefulness of the gonads and genitalia as defining factors in categorising men and women in a reproductive way. Consequently, gonads must also fail as gender identifiers.

In situations where genitalia are ambiguous, as in the case of hermaphrodites, doctors may resort to a chromosome check to help meet the classification process. The results of a chromosome check generally provide definitive proof of gender. The need on occasion to give weight to the chromosomes indicates the failure of genitalia and gonads to be 100% accurate in classification, and the lack of significance that the genitalia and gonads hold in gender identification. However, no matter what a person looks like on the outside, that is, even if they have had SRS, their chromosomes will always remain those they were born with. This generally amounts to XX for women and XY for men. Most people will have one or the other of these combinations and every combination will contain an X chromosome. However, there are numerous combinations of the sex genes or no combination at all. For instance, a single X and no corresponding sex chromosome characterize Turner's Syndrome. Even though the ovaries may be absent or exist only as a streak, this is a female condition. Once again, the gonads cannot be ascribed any significance, since they may not exist – as is the case with this condition. Klinefelter's Syndrome, a male disorder, bears an extra female chromosome, so there exists XXY chromosomes rather than just XY. Other variations in chromosomes include XXXY, XXXXY, XXYY, and XXXYY. This makes classification by chromosomes somewhat unreliable. The most important factor however, is that the chromosomes conflict with the BSTc size and the convictions of transsexuals. Consequently, chromosomes are unreliable as a means of categorising those with GID.

The neuronal structures or psychological factors of a person receive little if any significance when we make gender distinctions. However, if there is a brain structure that can be included when determining gender, are we not morally obliged to include it, especially when to do otherwise aids with discrimination and rights abuses against transsexuals? Although at present, there is a problem with the inclusion of the BSTc, because it is so small current technologies are unable to locate it until we are dead, this will change in the future, so that transsexuals will not have to wait until death to prove their convictions right. Morality commands of us that when we know better, other things being equal, we ought to do better. We know that in transsexuals, there is an area of the brain that conflicts with its own body and that it is most likely linked to the sense of gender they experience. We know that transsexuals are suffering discrimination and rights abuses because of this problem. In view of this, I believe we are morally obligated to afford some significance to the BSTc in the gender classification process.

6. The BSTc

However, I have not yet argued that there is some link between the BSTc and our sense of gender. Normally few of us question our gender. We accept our gender without too much thought. This acceptance may in part be due to the BSTc. Current thought holds the brain to be the organ responsible for the phenomena of consciousness, thought and emotion. While the research of Zhou et al. could not claim a link between the BSTc and our sense of gender, scientists know that the function of the BSTc relates somehow to sexual behaviour. No cause or effect or otherwise has been attributed to the BSTc region itself. If there is a correlation between what is structurally in the brain of a transsexual and their sense of identity, then this seems to amount to one of the following possibilities, either:

- i) BSTc volume constitutes one's sense of gender identity or,
- ii) BSTc volume causes one's sense of gender identity or,
- iii) One's sense of gender identity causes one's BSTc volume or,
- iv) The two are indirectly correlated or,
- v) There is a mere coincidence between the two or,
- vi) A common cause, resulting from exposure to neonatal hormones.

If (i) is the case and BSTc volume constitutes one's sense of gender identity, then one's psychology and neural structure are extensionally indistinguishable from one another, that is, there could not be a change in one without change in the other. If this is the case, then transsexuals are indeed justified in their conviction about their gender identity. However, if the BSTc does not have an effect until adulthood (when it changes), then this would seem to be contrary to the idea that the BSTc constitutes our sense of gender identity, since transsexuals have a sense of gender identity from a very young age. Of course, it could be the case that the BSTc forms at the pre-natal stage and only changes size at maturity while still constituting our sense of gender identity. If so, the BSTc and one's sense of gender identity is one and the same thing, as opposed to one causing the other.

If (ii) is the case and BSTc volume causes one's sense of gender identity, then one's sense of gender is at the mercy of the brain. It may be that the BSTc, affected by sex hormones during brain development, in turn has an influence on the thoughts of an individual affecting their sense of gender identity. However, this raises the same problem as raised by (i). If the volume of the BSTc causes one's sense of gender, why do transsexuals experience dysphoria before the increase in volume of the BSTc?

If (iii) is the case, then one's sense of gender identity causes one's BSTc volume. This would mean that thought influences the size of certain structures in the brain. This certainly appears to be the case with certain structures in the hippocampi. Studies carried out on the brains of London taxi drivers showed a certain amount of plasticity in some structures of the human brain as a 'function of increasing exposure to an environmental stimulus' (Maguire et al. 2000). However, it seems hard to believe that a five-year-old child could sustain such a consistent and determined thought without a fundamental source for that thought. Further, it seems unlikely that transsexualism, especially in the very young, is a functional response to environmental stimulus, given that parents of such children appear to make every effort to dissuade such thoughts. Additionally, there is no evidence to suggest that there is any plasticity within the BSTc itself or the hypothalamus area.

However, another possibility might include a combination of (i) and (iii), that is, one's sense of gender identity causes one's BSTc volume, which in turn constitutes one's sense of gender identity. This may explain the early sense of dysphoria experienced by transsexuals. Nevertheless, if we accept this explanation, there is still a question mark left hanging over the origins of our sense of gender.

If (iv) is the case, then this indicates that there is an indirect correlation between the BSTc and one's sense of gender identity. It may be the case that the BSTc influences another part of the brain, which in turn affects one's sense of gender identity.

If (v) is the case, then what appears to be a link between gender identity and the volume of the BSTc is merely coincidental. It may be that the BSTc is synonymous with one's sense of gender identity, even though there is no relationship between the two. This can only mean that an unrelated physical structure in the brain supports the transsexual's convictions about their gender in complete contrast to the rest of the body. Consequently, this would be an unbiased confirmation of transsexual convictions about gender. Further, if (v) is the case, then it becomes a puzzle as to how it is that the convictions of transsexuals correspond implicitly with a part of their brain that they cannot consciously know anything about, since even scientists must rely on autopsies to investigate this area of the brain. Accordingly, this hypothesis is unlikely, since we know that the area of the brain in which the BSTc exists is, in some way, linked to sexual behaviour. Therefore, it seems improbable that there is no relationship whatsoever between the two. Put another way, it seems more plausible that there is some relationship between the BSTc and one's sense of gender.

If (vi) is the case, which now seems the most likely explanation, then gender is affected by hormone levels during the neonatal stages of brain development. Consequently, hormones are in some way responsible for gender identity. The later volume of the BSTc is a result of exposure to hormones in the early stages of brain development. This would explain the early onset of dysphoria experienced by transsexual children coming to terms with their gender identity. A combination of (i) and (vi) may be the very basis of gender.

If, however, there are male genitalia, male gonads, male chromosomes, but a female BSTc size and the person insists that they are male, this would disprove the significance of the BSTc as a defining factor in gender identification. While such a case does not appear to exist, it still remains a possibility until otherwise disproved. Of course, for the most part such a person would simply appear normal, since their sense of gender identity and their body would not conflict.

7. The Importance Of Using All Biological Factors

Given that there are so many apparent problems with classification of gender using the current indicators alone, we ought to assign some value to the brain in this regard. As the brain is especially influential in our sense of self as gendered, perhaps it would be prudent to recognise its value in the structure of the BSTc. When looking at the possible relationships that may exist between the BSTc and one's sense of self as gendered, it appears that there is a strong likelihood that some association exists between the two. If this is so, it seems only reasonable that the BSTc be recognised as playing some vital part in gender identity and consequently, ought to be included as part of the identifying process. The sense of gender felt by transsexuals is so forceful that it drives them to change a perfectly good, healthy, functioning body into a dysfunctional one (one might consider this to be the case upon the removal of the reproductive organs during SRS). If the research findings by Zhou et al. (1997), Kruijver et al. (2001, 2002), and Chung et al. (2002) prove to be correct, this would seem to indicate that gender is not fully determined by reproductive organs or by social factors for that matter, but rather by the brain and its architecture. Further, if the scientists are right, then perhaps we ought to accept transsexuals' claims about their gender identity, when it is clear that certain parts of their brain are compatible with that claim.

The consequences of the scientific findings for people like Bagger, and indeed for the rest of us, lie in the very ideas we have of gender. For the most part, gender identity influences how others perceive us and expect us to behave in society. The determination of transsexuals to challenge the system and persevere to what seems extreme ends, to ignore the concerns of family, friends and society, to make themselves targets for discrimination and abuse by not conforming to their body image is indicative of a drive somewhat beyond normal desire. This sense of conviction is an enormous puzzle for most people. However, the BSTc may wholly or in part drive such a conviction. For instance, it may be the case that the significance of the BSTc lies in the fact that it constitutes our sense of gender identity. If this is so, can we ignore the challenge to our current method of gender classification? Are you the gender you believe yourself to be or the gender according to your genitalia, gonads and chromosomes? If it is according to your belief, it may well be that the BSTc has some connection to that belief.

Many now believe that individuals are not born psychologically gender neutral. Dr. Reiner M.D. (2000), an Associate Professor at Johns Hopkins, has carried out research on 36 male patients, whose genitalia at birth were such that doctors surgically reassign them to females. These males ranged in age from 5 to 16 years. Only two of these individuals were raised as males. Nevertheless, 19 of the other 34 reverted back to male, while 76% of the 34 would rather be a male life-long if possible. Reiner concludes, 'these findings suggest that the original hypothesis of gender identity – that there is gender neutrality at birth and a child's rearing determines her gender identity – is false' (Reiner, 2000). If Reiner is right, then it would appear that we are born with a gender already in place – it is not a choice we make. Therefore, it is understandable why transsexuals maintain their convictions in this matter.

8. The Legal System

If the research proves to be right and we insist on only applying the current indicators in identifying gender, then that identification will not only prove to be wrong in some cases but will be detrimental for transsexuals. Therefore, it only makes sense to try to improve the current system. The inclusion of the BSTc as a further means of identifying gender may well improve the situation for transsexuals. Of course, one could always argue that sex reassignment surgery is merely a cosmetic change and nothing about the fact that the person is a man (for instance) has changed. His/her body would still include male sex chromosomes and nothing can get away from this fact. This is certainly the case if society gives chromosomes priority as an indicator of gender. However, there is no good reason to accord chromosomes any more significance than the BSTc when deciding gender. It is for this reason I suggest that aside from the chromosomes, gonads, and genitalia we include the BSTc as part of the criteria for gender identification.

The Australian Family Law Courts recognise the importance of the BSTc and in the case of Kevin (validity of marriage of a transsexual) incorporated the testimony of many international and local experts in the field of transsexualism (Gurney, 2004). In the Kevin case Justice Chisholm concluded:

The evidence demonstrates (at least on the balance of probabilities), that the characteristics of transsexuals are as much “biological” as those of people now thought of as inter-sex. The difference is essentially that we can readily observe or identify the genitals, chromosomes and gonads, but at present we are unable to detect or precisely identify the equally “biological” characteristics of the brain that are present in transsexuals (Gurney, 2004).

One problem that might arise for the importance of applying the BSTc in this manner comes about if option (v) and possibly (iv) is the case, that is, if there is no connection between the BSTc and transsexuality or there is only a distant connection between the two. However, in the Kevin case, the Full Court upheld Justice Chisholm’s decision on appeal and established the position in Australian law that people with transsexualism should not be treated differently to others with intersexed conditions and should be ‘allowed to choose their sex, affirm it and be accorded full legal status as members of their chosen sex’ (Gurney, 2004).

9. Essential Needs

We each have a deep sense of who we are. However, according to Reiner (2000), ‘Gender is an internal reality and can only be intuited by the person.’ This internal reality is an absolutely fundamental feature of our deep sense of self. Being able to act in accordance with this deep sense of self is a vital aspect of acting autonomously. It may be from this aspect of acting autonomously that the right to gender identity generates. In line with the rest of us, it is one of the essential needs of the transsexual that they express the deep sense of who they are. Therefore, it would be morally wrong to deny them this essential right. Milton et al. (2005) has stated that rational individuals ought to have authority to make even life-altering choices when it involves their bodies and he also believes that these actions are a basic tenet of individual freedom. He states ‘individuals fare better in life if their gender and genitals match’ (Milton et al., 2005). Therefore, in accordance with their essential needs, we ought to permit transsexuals access to current technologies that would allow them to unite their gender and genitalia. However, not all transsexuals are in a financial position to meet their essential needs. We would never prevent a financially disadvantaged person receiving the best medical treatment the Public Health system has to offer. Can we do less for the financially disadvantaged transsexual?

There will always be fear and ignorance in society. There will always be those who will argue ‘once a man always a man’, and there will always be those who would argue that transsexuals like Bagger have an advantage in sport despite their surgery and hormone treatment. However, regardless of our opinions of the transsexual condition, we ought to protect them from discrimination and rights abuses.

If the findings by Zhou et al. (1997) prove to be right, they show that the current gender identification system can be refined to include the BSTc. This may not be possible just yet, but there is little doubt it will become possible in the future. However, we ought to try to improve circumstances for the transsexual now. Of course redesigning the body only solves part of the problem. We ought to consider their post-operative position also. Justice Chisholm has held that, ‘post-operatively, a person treated for transsexualism is a member of their re-assigned sex’ (Gurney,

2004). It is essential that we recognise transsexuals in their new post-operative role in every respect.

Yet, while Australia recognises the post-operative transsexual and permits a change to birth certificate and all subsequent documentation to correspond with the change, it still has some way to go in providing relief from the costs of surgery. When we recognise the predicament GID persons are in, how could we ignore their problem and still consider ourselves a moral society? Some financial relief from Medicare would go a long way to helping many transsexuals take up the lives currently deprived them because of the costs of surgery. It would also allow transsexuals interested in undergoing surgery to get the best medical treatment available, since they could then meet the costs of the more qualified doctors. This may reduce the number of post-operative problems that are associated with this surgery. Anything less than this appears to be discriminatory against transsexuals. There is no good reason to treat corrective surgery for the transsexual in any way different to that for other citizens. Since Medicare can provide treatment for other citizens seeking corrective surgery, it is my view that it ought to provide the same level of care to GID persons.

10. Conclusion

If the neuroscientists are proven right, then there may be reasonable justification for claiming that a part of oneself *is* a “natural born” woman or man, even if the rest of the body appears otherwise. Gender identity is always associated with the birth sex of an individual, which is decided on the basis of reproductive organs. However, there is also a neurobiological difference between males and females. This distinction may be responsible for the conviction we hold about our gender. The importance of the BSTc findings for transsexuals consists in the confirmation of their convictions about their own gender. These research findings ought to help us gain a better understanding of ourselves and help us in future discussions on topics such as gender identity, discrimination and other related topics. Gender identity currently depends on the outward appearance of the body at birth and this seems to be inadequate, at least in the case of transsexuals.

Discrimination highlights the ignorance and fears of a community. It exposes those negative aspects of human nature, which threaten to overtake all other moral considerations. My hope is that knowledge will extinguish the ignorance and fear that surrounds GID. Respect for transsexual rights, incorporating the right to surgery via Medicare to bring the body and brain into alignment and protection thereafter, on the basis of essential needs, must surely be the morally right approach to take in the case of transsexuals. If it is the case that gender is a neurobiological matter, then transsexual rights ought to be in accordance with their convictions about their gender. For, if there is a link between the BSTc and a person’s gender convictions, then it may well prove to be a very significant link that exceeds the significance of the gonads, chromosomes and genitalia in defining a person’s gender.

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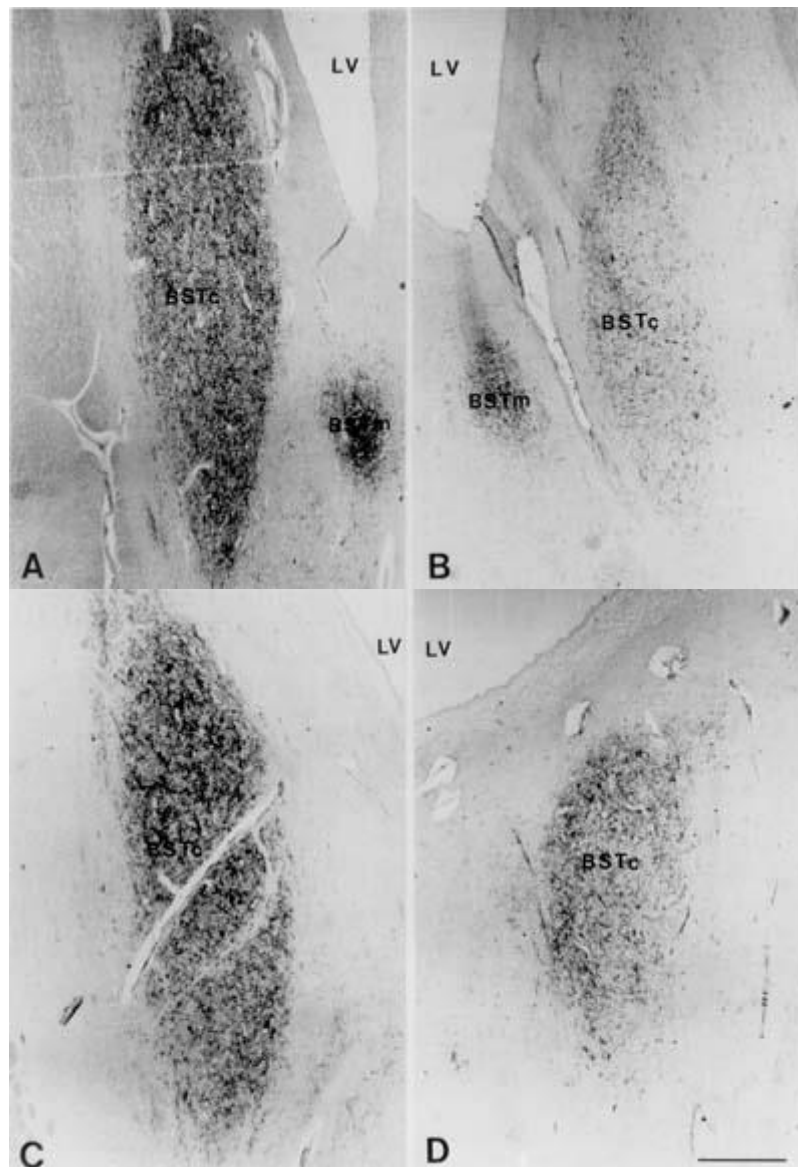
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Appendix

Figure 1: Representative sections of the BSTc innervated by vasoactive intestinal polypeptide (VIP). A: heterosexual man; B: heterosexual woman; C: homosexual man; D: male-to-female transsexual. Bar=0.5 mm. LV: lateral ventricle. Note there are two parts of the BST in A and B: small sized medial subdivision (BSTm), and large oval-sized central subdivision (BSTc).



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Notes

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